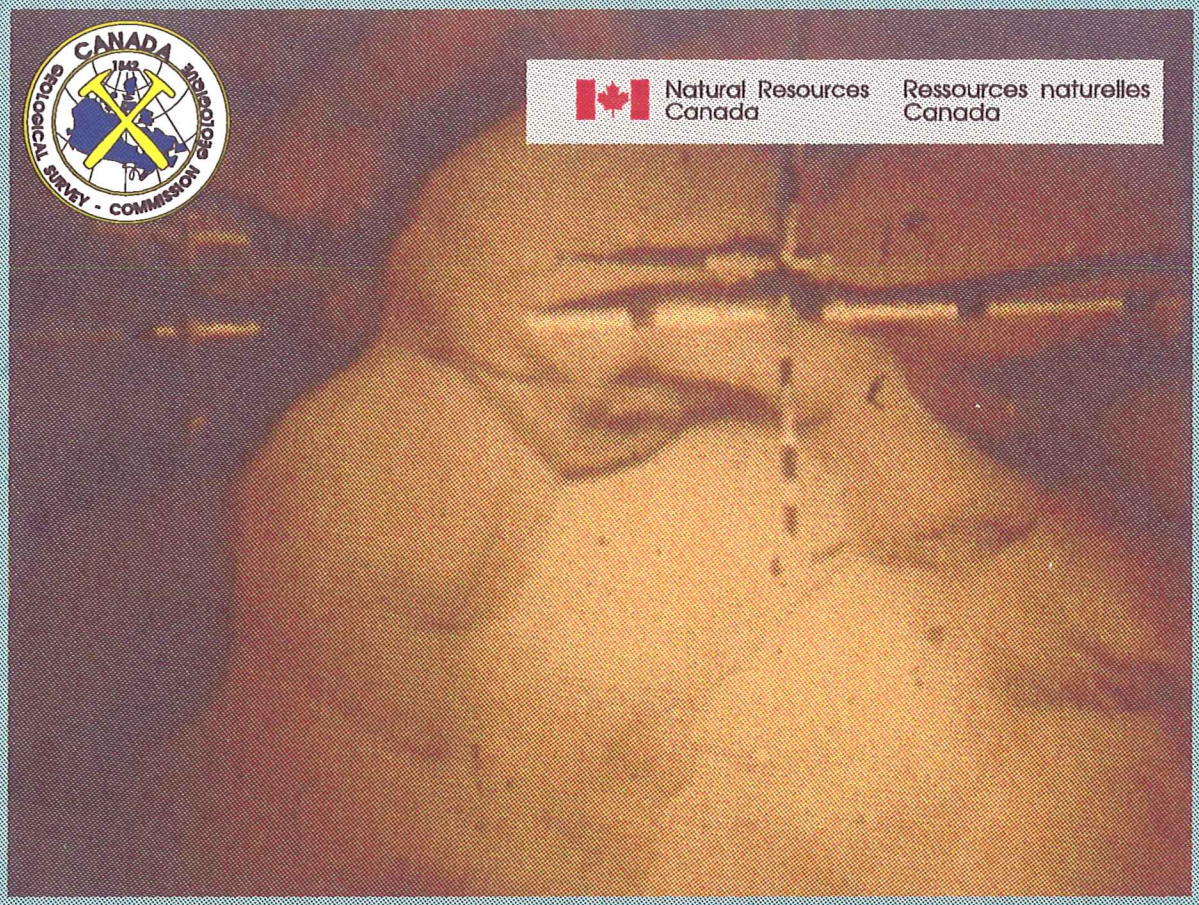

Hydrodynamics and Seabed Stability Observations on Sable Island Bank - A Summary of the Data for 1994/95

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for

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by

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1. INTRODUCTION

Storm processes dominate sediment transport on the Scotian Shelf, and the resulting large-scale bedform migration, seabed scouring and infilling cause serious problems for offshore installations. Several bottom boundary layer models for combined waves and currents are available for the prediction of near-bed velocity profiles and enhanced bed shear stresses (Smith, 1977; Grant and Madsen, 1979, 1986), but their applicability over a wide range of conditions is not tested due to the lack of high quality field data of simultaneously measured waves, currents and seabed responses. Bedforms are almost always present on the continental shelf and they interact with waves and currents to affect near-bed velocity profiles, skin friction/form drag partition and sand resuspension (Wiberg and Nelson, 1992; Vincent et al., 1991; Li, 1994; Li et al., 1996). Though a model has been proposed to predict bedforms under combined flows (Li and Amos, in review[a]), it has not been tested by independent field data. Before sediment transport and seabed stability can be correctly assessed, threshold criteria have to be defined for the initiation of various transport modes: bedload transport, saltation/suspension and sheet flows. While these are reasonably defined for either waves or unidirectional flows, solutions and field data are very limited for combined flows (Hammond and Collins, 1977; Amos et al., 1988; Li and Amos, in review[b]; Li et al., in review). Due to the complexity of the above mentioned processes and problems, the predictions of sediment transport and seabed scouring are poor both for the free stream (without structure interference) and around offshore structures. The Geological Survey of Canada (GSC) continental shelf sediment transport model, SEDTRANS, has been developed in order to deal with these issues (Martec Ltd., 1984, 1987; Davidson

and Amos, 1985). This Fortran 77 numerical model has recently been re-evaluated and upgraded to SEDTRANS92 by Li and Amos (1993, 1995) and has been tested with limited field data (Li et al., in review). However, more field data are needed for further improvement and full testing of this model.

A joint project between GSC and LASMO Nova Scotia Limited was initiated in 1993 to monitor storm wave-current dynamics and seabed responses on the Scotian Shelf. The objectives of the project are (a) to investigate the interaction and relationship between the free stream bottom boundary layer dynamics and sediment transport, (b) to determine the mode, magnitude and direction of free-stream seabed sediment transport at the LASMO production site, (c) to define the nature and stability of large-scale bedforms and (d) to monitor and measure scour around seabed installations and adapt predictive capabilities for installation scour/siltation. Various instrumentation packages have been deployed near the LASMO Cohasset/Panuke production site (Figure 1) during several cruises since 1993 to obtain in situ wave, current and seabed response data under storm conditions. A complete listing of the deployment sites/cruises, instrumentations, and data collected are given in Table 1. The field activities for these deployments have been described in a GSC internal report (Zevenhuizen and Li, 1994). The data collected for the period of 1993/94 and the results of their primary analysis have been summarized in an GSC Open File Report (Li et al., 1994). This report is a summary of the data collected at sites 2, 3 and 4 for the period of 1994/95. Detailed scientific interpretations of these data, however, will be presented in subsequent scientific publications. The GSC instrumented tripod RALPH landed on its side when it was deployed at Site 5 and the RALPH camera failed during its deployment at Site 6 (though about 320 bursts of wave and current data were collected). Thus data from these sites will not be discussed further here.

2. INSTRUMENTATION

Figures and detailed description of various instruments used in this project are given in Li et al. (1994). Only related and new instruments are described here in this section.

RALPH is a computer controlled, autonomous instrumented tripod used for measuring near-bed wave-current dynamics and monitoring seabed responses in marine environments (Heffler, 1984; Amos et al., 1994). The early version of RALPH (RALPH2) was equipped with a pressure transducer (for wave and depth measurements), two acoustic current meters (for velocity measurements), two light

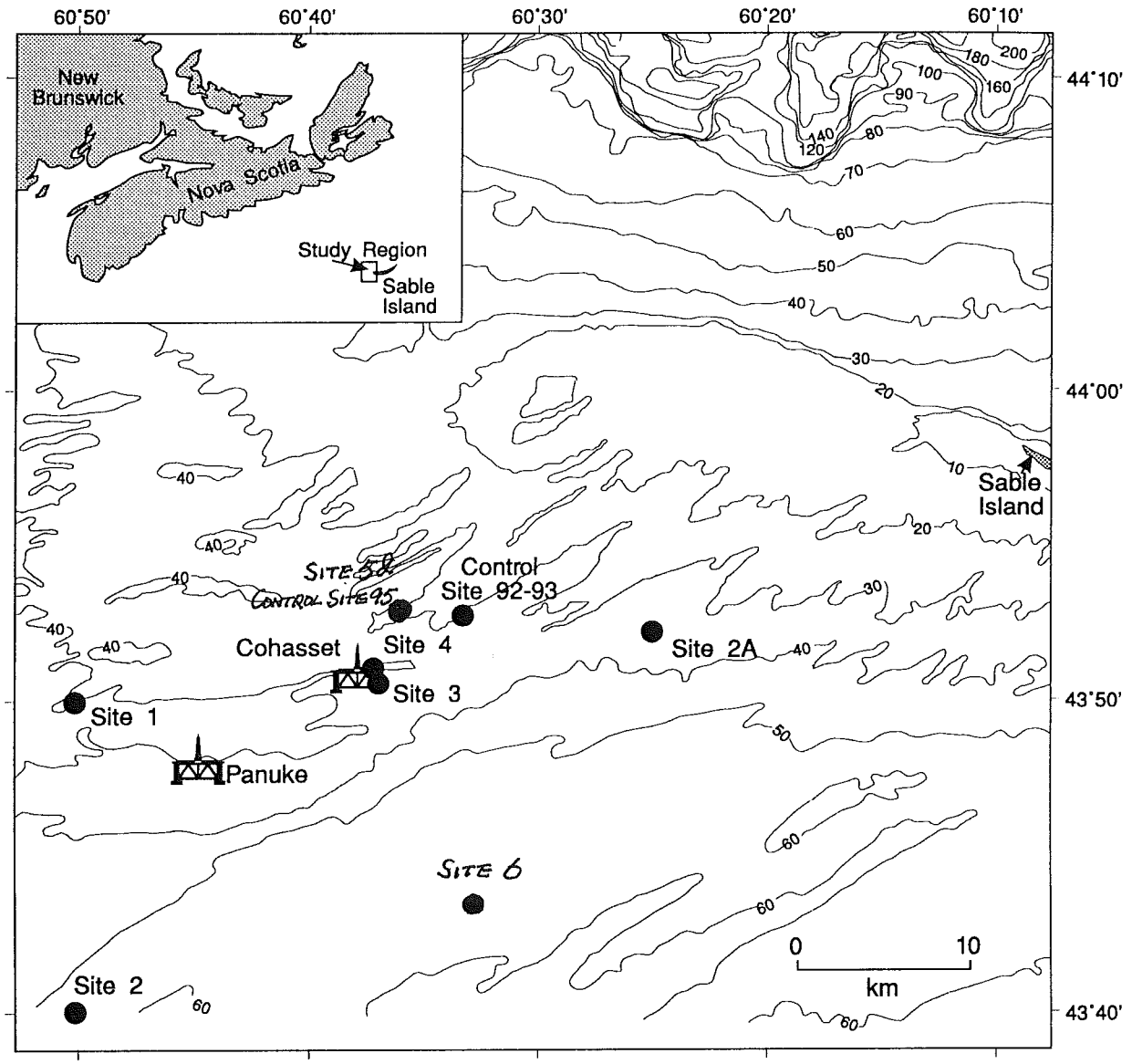

Figure 1 The location map showing the study region of the GSCA/LASMO hydrodynamical and seabed stability project on Sable Island Bank, Scotia Shelf.

Table 1 Summary of sites, instrumentation and collected data for the SIB GSCA-LASMO joint project during the period of 1993/95.

Site/Date	Location	Depth	Instrumentation	Bottom Samples	Data Acquired	Notes
Site 1 15/1/93- 28/2/93	43^0 59.91'N 60^0 50.15'W	42 m	Ralph: 18 min. burst every 2 hours at 1 Hz; 2 photos 15 min. apart for each burst; S4C: continuous records of 15 sec. average; Control S4C: same as S4C; S4B: 10 min. burst every 2 hrs. 1Hz	2 grab samples; well-sorted medium sand D = 0.34 mm	Ralph: 17/1 to 14/2/93 S4C: 15/1 to 28/1/93 Control S4C: 15/1 to 27/1/93 S4B failed; nearly 700 seabed photos	Ralph damaged so not deployed at site 2
Site 2 28/2/93- 30/4/93	43^0 39.97'N 60^0 49.91'W	52 m	Sobs: continuous OBS records at 0.5 Hz; 10 s video records every hour; Site 2 S4C: same as Site1 S4C; Control S4C: same as Site1 S4C; S4B: 10 min. burst every 2 hrs. 1Hz	no bottom samples	Sobs: had 120 records of good burst video; no other data recorded; S4C: 26/2 to 22/3/93 S4B: 26/2 to 26/3/93	Sobs damaged so not deployed at site 2a; Control S4 not recovered;
Site 2a 30/4/93- 16/6/93	43^0 52.13'N 60^0 25.95'W	37 m	Ralph: same as Site 1 New control S4C: continuous records of 30 sec average	grab sample at Ralph site; D = 0.32 mm. grab sample at site 2 Sobs site; D = 0.2 mm	Control site S4C: 30/4 to 15/5/93 Site 2 control S4C: 27/2 to 26/3/93	Ralph failed; Failed to recover old control S4. But was recovered by ROV on 1/8/93
Hudson 93-016 10/6/1993- 17/6/1993	The whole region		SeaCarousel, van Veen, IKU, Helley Smith sediment samplers, vibrocore, and bottom camera	Multi-disciplinary survey to gather geological, geophysical and sediment dynamics information for the whole region; retrieved Ralph, SOBS, S4s; 5 Sea Carousel deployments; 45 IKU and grab samples; 20 camera stations; 4 anchor and vibrocore stations.		
Site 3 24/11/93- 26/1/94	43^0 51.06'N 60^0 36.58'W	40 m	Ralph: 18 min. burst every 4 hours at 1 Hz; seabed photos 18 min. apart at the start of each burst, every 30 min. after. S4A and S4B: 10 min. burst every 2 hours at 0.5 Hz. Sobs: failed.	Two grab samples. Well-sorted medium sand, D = 0.38 mm	Ralph: 28/11/93 to 31/12/1993; S4A: 27/11/93 to 21/1/94; S4B: not recovered.	Sobs did not work S4B not recovered

Table 1 (continued)

Site/Date	Location	Depth	Instrumentation	Bottom Samples	Data Acquired	Notes
Site 4 7/3/94- 29/4/94	43^0 52.02'N 60^0 36.75'W	36 m	Ralph: same as Site 3; Sobs: failed;	one grab sample, well sorted medium sand D = 0.31 mm	Ralph: 7/3/94 to 29/4/94	No S4 deployments; Sobs did not work.
Site 5 20/1/1995- 24/3/1995	43^0 52.8'N 60^0 36.1'W	27 m	Ralph: same as Site 3;	one grab sample, medium-coarse sand	No data collected	Ralph landed on its side.
Site 6 24/3/1995- 5/5/1995	43^0 44.19'N 60^0 33.64'W	62 m	Ralph: same as Site 3; Site 6 S4: 10 min. burst every 2 hrs. at 1 Hz Site 5 S4: 10 min. burst every 2 hrs. at 1 Hz DODO-4:	one grab sample, fine-medium sand	Ralph: 24/3/95 to 17/5/95; Site 6 S4 failed;	Ralph camera failed; Site 5 S4 not recovered; DODO-4 logger leaked water
Hudson 95-033A 15/11/1995- 21/11/1995	The whole region		Ralph, 2D-DODO, van Veen, IKU, Helley Smith sediment samplers, and bottom camera	Multi-purpose survey to gather geological, geophysical and sediment dynamic information for the whole region; Deployed RALPH and test-deployed 2D-DODO; 23 IKU and grab samples; 11 camera stations; Collected 14 sediment samples in 1 anchor station.		

transmissometers (for suspended sediment concentration measurements), a compass (for orientation), a super-8 movie camera with flash (for seabed response measurements) and a 20 Mbyte TattleTale Model 6 data logger. A shadow bar was also installed on the tripods about 20 cm above the seabed in this study. Knowing the geometry and setups of the light, camera and the shadow bar, we can use the shadow casted on the rippled bed to measure ripple heights as well as ripple lengths and ripple migration rates. Six sediment traps were attached to the tripod frames to collect samples of suspended sediment. Recently, RALPH2 has been upgraded to RALPH3. Besides the pressure transducer, compass and camera, the RALPH3 now supports a 2.2 Mhz Mesotech Acoustic Backscatter Sensor (ABS) to provide accurate measurements of seabed elevation and profiles of suspended sediment concentration (SSC). Arrays of 4 Marsh-McBirney ElectroMagnetic Current Meters (EMCM) and 6 Optical Backscatter Sensors (OBS, Downing, 1983) are also included for profiles of velocity and SSC. The 20 Mbyte data logger of RALPH2 is upgraded to a TattleTale Model 7 data logger with a 200 Mbyte hard disk. Without further specification, "RALPH" in this report refers to RALPH2.

SOBS (Seabed Observatory of Benthic Stability) is also an instrumented tripod similar to Ralph, but focuses on monitoring seabed responses and suspended sediment concentration profiles. It is equipped with a pressure transducer at 1.6 m above the bottom for wave measurement and six Optical Backscatter Sensors (OBS, Downing, 1983) in a vertical array for measuring suspended sediment concentration at heights from 0.1 to 1.6 m above the seabed. The bottom response is monitored using a Sony 101 video camera with a scaled shadow bar attached for ripple geometry and migration measurements. Data are again logged on a TattleTale Model 6 microcomputer.

S4 Wave-Current Meters are self-contained, spherically shaped and commercially available electromagnetic wave-current meters from InterOcean Systems Inc. They measure depth, waves, current magnitude and direction. An internal fluxgate compass records the current direction relative to magnetic north. Data are stored internally in solid-state, high-reliability memory (1 Mbyte). The electronics and power supply modules are contained within a compact 25 cm diameter sphere. S4 wave-current meters can be deployed independently on current meter stands, or incorporated on a tripod.

DODO-4 and 2D-DODO The Depth Of Disturbance Observatory (DODO) is a computer controlled, autonomous instrumented quadrapod used for high resolution and high frequency measurements of seabed scouring and suspended sediment concentration. The quadrapod is made of 4"x4" square steel

frames with a dimension of 8' x 8' x 10'. The early version, DODO-4, was equipped with a 300 psi pressure transducer, a flux-gate compass, and 4 downward-looking 2.2 Mhz Mesotech acoustic backscatter sensors mounted 1.5 m above the seabed. Sensor programming and data logging are controlled by a TattleTale Model 7 computer of 200 Mbyte capacity. With proper calibrations, this instrumentation can be deployed close to rigs or pipelines to monitor seabed scouring, bedform development and profiles of suspended sediment concentration. This instrumentation was deployed for testing at Site 6 in March of 1995 and then upgraded to 2D-DODO to include an Imagenex Sector Scanning Sonar (SSS) for profiling bedform heights and migration rates. The 2D-DODO was incorporated on RALPH3 and deployed on the Hudson cruise 95-033A. This expanded Ralph3 system can provide information on ripple formation, bedload transport, profiles of suspended sediment concentration, depth of seabed scouring, genesis and stability of large-scale bedforms as well as wave and current data.

3. DATA FROM SITE 2

3.1 Instrumentation and General Description

Site 2 was at the southwest corner of the study region (43^0 39.97'N, 60^0 49.91'W, Fig. 1). The water depth at Site 2 was about 52 meters and the bottom sediment was composed of well-sorted medium sand. The GSC instrumented tripod SOBS and three S4 wave-current meters were deployed at Site 2 and the 92/93 control site from February 28th to April 30th of 1993. One van Veen grab sample was collected at the end of the deployment and the bottom sediment was found to have a mean grain size of 0.32 mm. The detailed grain size analysis data is given in Appendix 1. Sediment traps installed on SOBS also collected suspended sediment samples. These samples showed several correlated layers which probably indicate storm events during the deployment. Both mean grain size and sedimentation flux show systematic decrease with heights above the seabed. Details of the sediment trap data can be found in Li et al (1994).

3.2 S4 Wave-Current Meter Data

Two S4 wave-current meters were deployed at Site 2, one in continuous mode and one in burst mode, and a third continuous-mode S4 was deployed at the control site (43^0 51.94'N, 60^0 34.16'W). Continuous-mode S4's were programmed to record 15-second averages of depth, mean current velocity

and current direction at a height about 50 cm off the bed, and the burst-mode S4 sampled data for a duration of 10 minutes every two hours at a frequency of 1 Hz.

The burst-mode S4 recorded data from 27/2/93 to 26/3/93. The continuous-mode S4 recorded data from 27/2/93 to 22/3/93 and the continuous-mode S4 at the control site recorded data from 27/2/93 to 27/3/93. Martec Limited was contracted to process the raw data recorded by these S4 current meters (Martec Ltd., 1994; 1995). For the continuous-mode S4 data, mean velocity averaged over 15 minutes was obtained for the entire deployment period. For the burst-mode S4 data, each 10-minute burst was averaged to obtain the mean depth (h), the mean u and v velocity components which were then used to compute the mean current velocity (u_{50}) and current direction (C_{dir}). The mean depth was then subtracted from the depth record to obtain the wave height time series, and this was then used to perform spectral analysis for computing the significant wave height (H_s) and spectral peak wave period (T_p) for each time series. For each velocity time series, the mean u and v velocity components were removed from each velocity record to obtain the time series of the wave orbital velocity. Mean values were obtained for the absolutes of the u and v components of the wave orbital velocity. The tangent of these means and the wave height data were then used to compute the burst-averaged wave propagation direction (W_{dir}).

The measured wave-current data of mean water depth (h), mean velocity (u_{50}), height of the mean velocity measurement (z), current direction (C_{dir}), significant wave height (H_s), wave period (T_p), and wave propagation direction (W_{dir}) are listed in Appendix 2 for all the bursts recorded by the burst-mode S4 meter. Time series of h, u_{50}, H_s and T_p are plotted in Figure 2 to provide an overview of the Site 2 data. Figure 2 shows that the tidal range and mean velocity u_{50} reached about 1.5 m and 0.25 m/s respectively during the spring tide, but were only about 0.5 m and less than 0.1 m/s during the neap tide. One major storm (around Julian Day 74) and four small storm events occurred during the deployment period at Site 2. Significant wave height and wave period reached about 7 m and 16 s during the major storm, and were only 1 - 3 m and less than 13 s during the four small events.

3.3 SOBS Data

SOBS deployed at Site 2 was programmed to sample all the OBS sensors and the pressure transducer continuously at the frequency of 0.5 Hz, while the video camera was operated to record 10 s of seabed images every hour. Unfortunately the pressure transducer and the OBS array did not work in

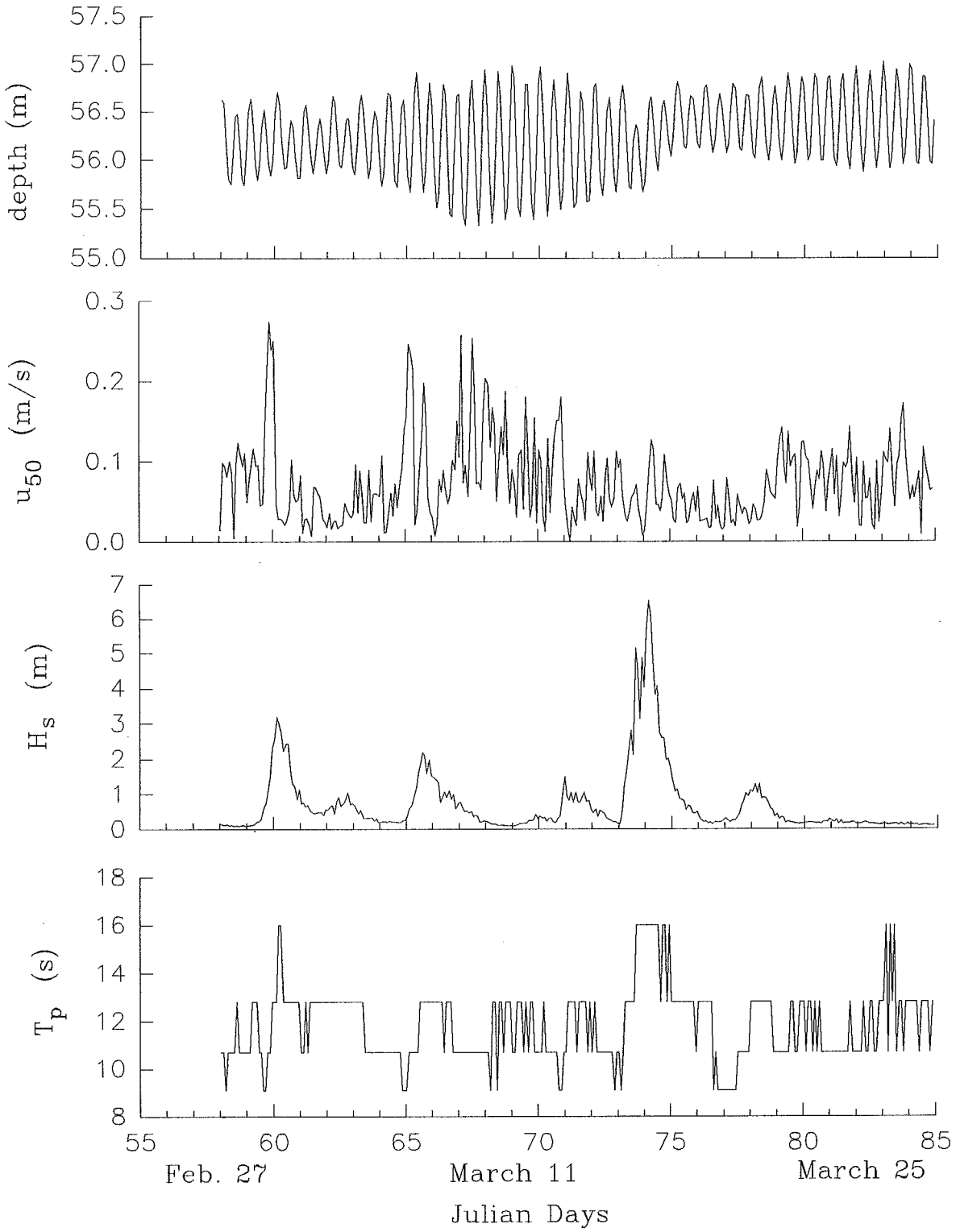

Figure 2 Overview of Site 2 data showing the time series of water depth, mean velocity (u_{50}), significant wave height (H_s), and spectral-peak wave period (T_p).

this deployment and the video camera only collected 120 10-second records (a total length of 20 minutes). This record, however, did partially overlap with the S4 data and will be discussed in detail here in this report.

The video data collected by SOBS were analyzed using a SVHS VCR and television monitor. Each 10-second recording was analyzed for ripple types and bed state classification. Bedload transport was determined by visual inspection of the video images and/or ripple pattern change between the two consecutive records. The general deterioration of image clarity marks the initiation of saltation/suspension, while the combination of strong image blurring and clearly-recognized flat bed indicates the upper-plane bed sheet flow conditions. The scaled shadow bar on SOBS was damaged during the deployment process and thus could not be used to measure ripple geometry. Therefore ripple height and length data cannot be obtained from the video data. The results of Site 2 video image analysis are given in Appendix 3 which lists for each burst the Julian day and hour, VCR counter number and ripple type and bed state classification. The following types of bed states are used in Appendix 3:

NM	no motion (possible bioturbation)
C	current ripples: C_s, straight-crested; C_l, linguoid
C_w	current-dominant ripples with secondary wave ripples
W/C	wave and current ripples of equal magnitude
W_c	wave-dominant ripples with secondary current ripples
W	wave ripples
SS	saltation/suspension
LWR	large wave ripples
UPB	upper plane bed/sheet flow

The comparison between wave-current data in Appendix 2 and bed state classification in Appendix 3 shows that the events of bedload, suspension and sheetflow cannot be matched up with the corresponding wave-current conditions. For instance, SOB's video imagery showed upper-plane beds under sheet flow at hour 17 on day 58 (Appendix 3). But the significant wave height and mean current for this burst were only 0.11 m and 0.10 m/s indicating non-storm conditions. H_s only reached the storm level (about 3 m) on day 60 at 2:00 AM. This suggests that there is a time discrepancy of about 32 hours between the observed seabed responses and wave-current dynamics. Figure 3 compares the observed bed

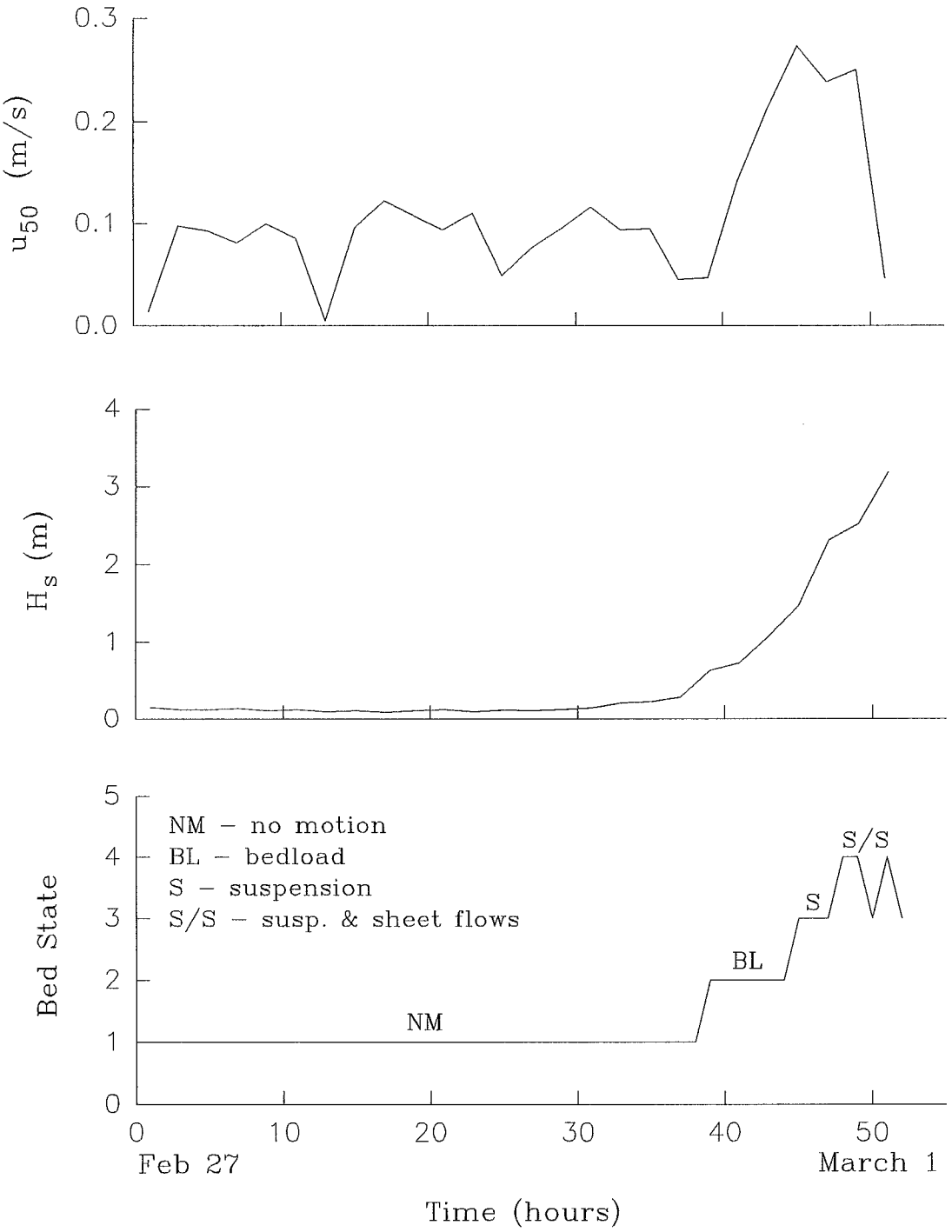

Figure 3 Time series plots of mean velocity (u_{50}), significant wave height (H_s), and observed bed states for Site 2. Various bed states are numbered as 1 = no motion, 2 = bedload, 3 = suspension, and 4 = suspension and sheet-flow.

state with the corresponding mean current velocity u_{50} and significant wave height H_s with this time discrepancy being corrected. The initiation of bedload transport, saltation/suspension and sheet flow correlates well with the observed wave-current dynamics after correcting the time offset.

3.4 Predictions By SEDTRANS92

The application of the GSC sediment transport model SEDTRANS92 is an important aspect in studying bottom boundary layer dynamics and sediment transport on continental shelves (Li and Amos, 1995; Li et al., in review). For given inputs of wave, current and seabed conditions, this Fortran 77 numerical model applies the combined wave-current bottom boundary layer theory to predict wave-enhanced bed shear stresses, velocity profiles, and sediment transport rate and direction. Sediment mean grain size D, ripple height H_r, grain size class fraction F, sediment and flow densities R_s and R_f have been added to Appendix 2 so that it also serves as the input data for running SEDTRANS92. The mean ripple length L_r was obtained based on Site 2 SOBS video data. The mean ripple height H_r was then calculated from $H_r = 0.13L_r$ based on the combined-flow ripple data observed at Site 1 (Li and Amos, in review[a]).

The raw wave, current, sediment grain size and bed roughness data of Appendix 2 were used to run SEDTRANS92 to predict various time-dependent boundary layer dynamics parameters and sediment transport rates for Site 2. The output data are divided into two parts, one part related to the parameters that define the bottom boundary dynamics, and the second that determines the sediment transport rate. The bottom boundary layer dynamics parameters are:

u_b	-	near-bed maximum wave orbital velocity (m/s)
A_b	-	near-bed wave orbital amplitude (m)
f_{cw}	-	combined wave-current friction factor
u_{*cs}	-	skin friction current shear velocity (cm/s)
u_{*ws}	-	skin friction wave shear velocity (cm/s)
u_{*cws}	-	skin friction combined wave-current shear velocity (cm/s)
u_{*c}	-	total current shear velocity (cm/s)
u_{*w}	-	total wave shear velocity (cm/s)
u_{*cw}	-	total combined wave-current shear velocity (cm/s)
d_{cw}	-	thickness of the wave-current boundary layer (cm)

z_o - inner layer bottom roughness (cm)

z_{oc} - apparent bottom roughness above the wave boundary layer (cm)

and the sediment transport parameters generated by SEDTRANS92 are:

q_{EH} - mean sediment transport rate of Engelund-Hansen method (kg m^{-1} s^{-1})

D-EH - sediment transport direction of Engelund-Hansen method (degrees)

q_{EB} - mean sediment transport rate of Einstein-Brown method (kg m^{-1} s^{-1})

D-EB - sediment transport direction of Einstein-Brown method (degrees)

q_{BGN} - mean sediment transport rate of Bagnold method (kg m^{-1} s^{-1})

D-BG - sediment transport direction of Bagnold method (degrees)

q_{YL} - mean sediment transport rate of Yalin method (kg m^{-1} s^{-1})

D-YL - sediment transport direction of Yalin method (degrees)

These SEDTRANS92 output data are listed in Appendix 4. Based on the Einstein-Brown bedload formula, the predicted sediment transport rates reached about 0.006 - 0.007 and 0.02 - 0.04 kg m^{-1} s^{-1} for moderate and major storms respectively at site 2.

4. DATA FROM SITE 3

4.1 Instrumentation and General Description

Site 3 was located southeast of the rig at Cohasset, roughly at the centre of the study region (43^0 51.06'N, 60^0 36.58'W, Fig. 1). The water depth at Site 3 was about 40 meters. Instrumented tripods Ralph, SOBS, and two burst-mode S4 current meters (S4A and S4B) were deployed in line separated by about 100 m. The deployment was from November 24, 1993 to January 26, 1994. Two van Veen grab samples were also collected which showed that the bottom sediment was composed of well-sorted medium sand with a mean grain size of 0.38 mm. Plots and detailed grain size data are given in Appendix 1. SOBS landed on its side and did not work properly. One of the burst mode S4 (S4B at 43^0 50.89'N and 60^0 36.95'W) has not been recovered to date. We assume that the meter was buried as extensive ROV surveys of the area were fruitless. If this is true, the burial of over 0.7 m must have taken place.

4.2 S4 Wave-Current Meter Data

The burst-mode S4 wave-current meter S4A recorded data from 27/11/93 to 21/1/94 for about 55 days. S4A was programmed to sample data for a duration of 10 minutes in every 2 hours at a frequency of 0.5 Hz. Martec Limited was contracted to process the raw data (Martec Ltd., 1995). The procedures of raw data processing were the same as described in section 3.2. The mean water depth (h), mean velocity (u_{50}), height of the mean velocity measurement (z), current direction (C_{dir}), significant wave height (H_s), wave period (T_p), and wave propagation direction (W_{dir}) are listed in Appendix 5 for all the bursts recorded by the burst-mode S4 meter. Time series of h, u_{50}, H_s and T_p are plotted in Figure 4 to provide an overview of the S4 data at Site 3.

4.3 RALPH Wave-Current and Sediment Suspension Data

RALPH recorded data from 28/11/93 to 31/12/93 for a total of 34 days. RALPH halted on December 31 due to an error of time tracking in RALPH's programming to properly change the date at the transition to a new year. The two SACM acoustic current meters were at heights of 0.5 and 1.0 m above seabed, while the SeaTech optical transmissometers were at 0.33 and 0.68 m respectively. The shadow wire, marked in 0.1 m interval scales, was located 0.2 m above the seabed (a vertical distance of 0.35 m from the flash light) and about 0.44 m outward from the nadir of the flash light. These gave a flash-light incident angle of 51^0 at the height of the shadow wire. RALPH was programmed to sample all the sensors for an 18 minute duration every four hours at a frequency of 1 Hz. At the start of each time series, RALPH's super-8 movie camera took two photos of the seabed with an 18 minute separation. For the rest of the time, a single photo was taken every half hour.

For each time series, the data was averaged to obtain the mean water depth (h), mean current velocities at 0.5 and 1.0 m above the bottom (u_{50} and u_{100}), current direction for u_{100} (C_{dir}), and mean water attenuations (%) at 0.33 and 0.68 m heights (C_{33} and C_{68}). Martec Limited was contracted to process the data to derive wave parameters (Martec Ltd., 1995). The mean water depth was subtracted from the depth record to obtain wave height time series, and spectral analysis was then performed to compute the significant wave height (H_s) and spectral peak wave period (T_p) for each time series. For each velocity time series, the mean value was removed from each record. The absolute values of the u and v components of the wave orbital velocity were then averaged to get their means which were then used to

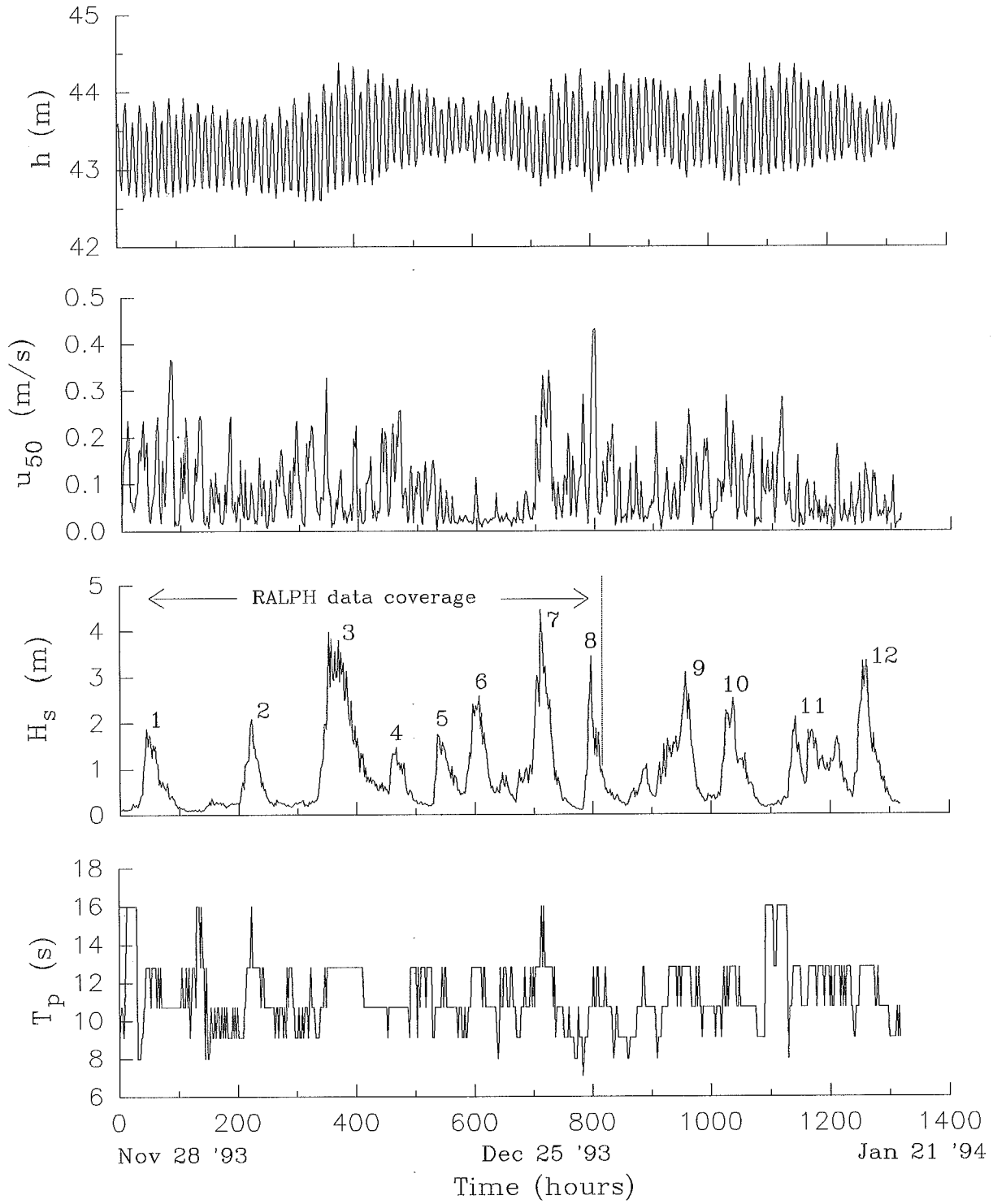

Figure 4 Overview of Site 3 S4 data showing the time series plots of water depth (h), mean velocity (u_{50}), significant wave height (H_s), and spectral-peak wave period (T_p).

compute the burst-averaged wave propagation direction (W_{dir}) from the tangential relationship. The measured wave-current data of h, u_{100}, z (height of mean current measurement), C_{dir}, H_s, T_p, W_{dir}, C_{33} and C_{68} are listed in Appendix 6 for all bursts recorded by RALPH. Time series of h, u_{100}, H_s, T_p, and C_{33} are plotted in Figure 5. Site 3 RALPH data covered 3 spring tides and 2 neap tides. The tidal range was about 1.5 m and u_{100} reached more than 0.35 m/s during the spring tides. During neap tides, the tidal range was less than 1 m and u_{100} was only about 0.1 m/s. Four major storms occurred during the deployment at Site 3 in which H_s reached more than 3 m and T_p was about 15 s. RALPH also recorded 4 smaller storms in which H_s ranged from 1 to 2 m and T_p was about 12 - 13 s. Water attenuation data (C_{33} in transmission %) showed strong variation from 10% to 95%. Most of the attenuation peaks correlate with the storm events, but some also occur in fair weather conditions (e.g. days 11 and 27 in Figure 5). These peaks could be due to dispersal of rig drilling mud as observed on the RALPH seabed photos (see discussion later).

4.4 RALPH Seabed Image Data

A total of 1836 seabed photos were taken at Site 3 by the RALPH camera and these correlated with 204 wave-current time series. The digitization system used to analyze RALPH seabed images from Site 1 deployment had been dismantled and thus RALPH images from Sites 3 and 4 were not analyzed digitally. Instead a 35 mm document viewer was used to view and analyze each image directly from the super-8 camera film. Each section of 54 frames taken in one day was marked to keep track of time and burst number. Ten consecutive frames can be viewed at once on the document viewer. This enables easy observation of sediment motion and ripple pattern changes.

Each burst-correlated pair of images was directly analyzed for seabed state classification, ripple orientation, ripple geometry and ripple migration rate measurements. The clearness of the image in combination with migrating ripples or ripple pattern change defines bedload transport. The general deterioration of image clarity marks the initiation of saltation/suspension, while the combination of strong image blurring and clearly-recognizable flat bed indicates the upper-plane bed sheet flow conditions. For each image, ripple wavelength L_r was directly measured by referencing to the scales on the shadow bar. Ripple height H_r could be calculated by knowing the light-shadow bar geometry and measuring the horizontal distances between the shadow and shadow bar for the ripple crest and trough respectively. However, the shadow wire was buried by sediment in most of the images and the measurements of ripple

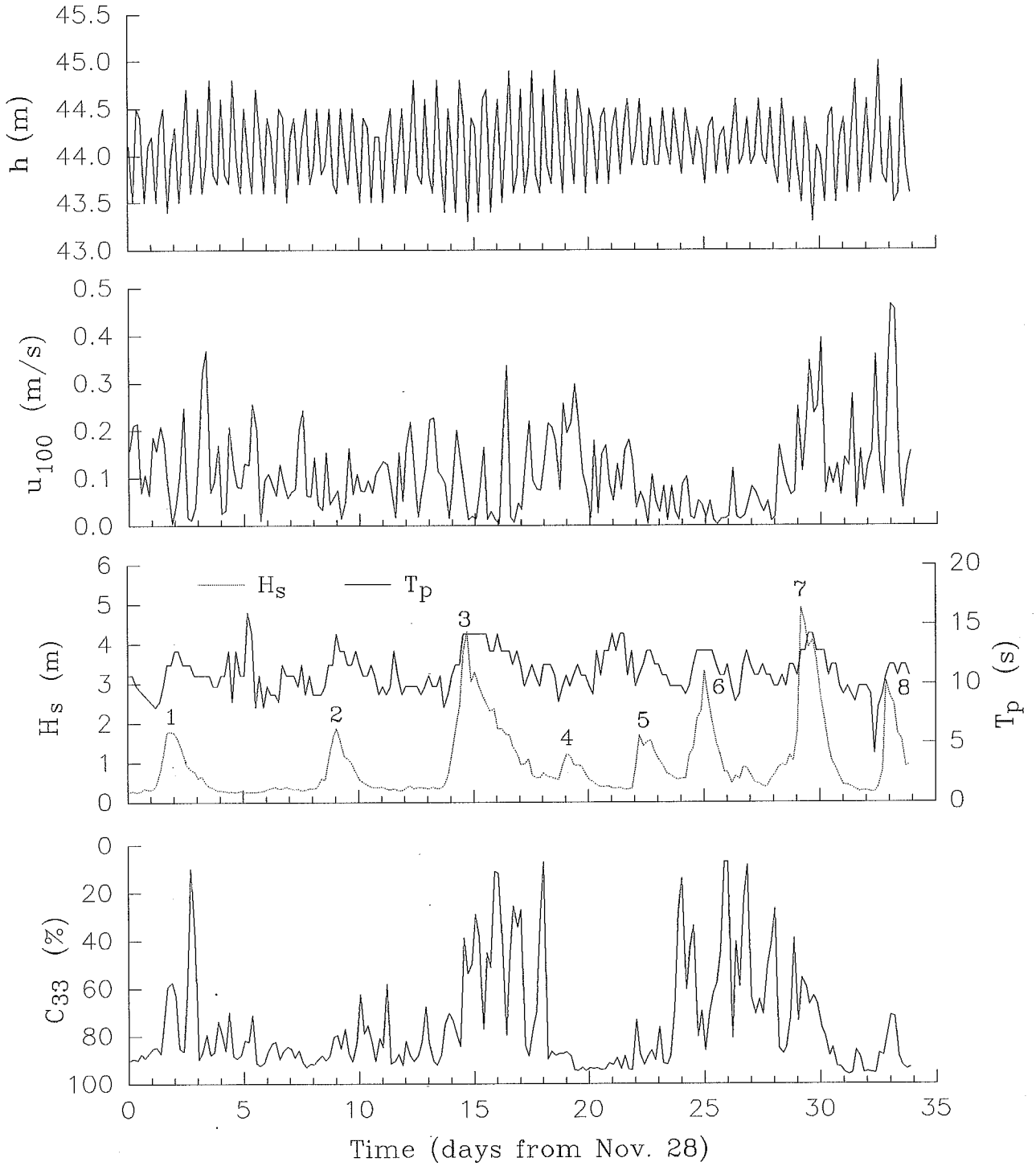

Figure 5 Overview of Site 3 RALPH data showing the time series plots of time series plots of water depth h, mean velocity (u_{100}), significant wave height (H_s), spectral-peak wave period (T_p) and sand suspension in transmition % at 33 cm above the seabed (C_{33}).

height were very limited. Therefore the height for current or current-dominant ripples was calculated according to Allen (1970):

$$H_r = 0.074L_r^{1.19} \quad (1)$$

For wave, wave-dominant or combined wave-current ripples, a mean ripple steepness of $H_r/L_r = 0.13$ was assumed based on ripple measurements at Site 1 (Li and Amos, in review[a]). The ripple height was then simply computed as $H_r = 0.13L_r$ for these ripples. The ripple crest lines were traced on to a mylar template and the tracings from each related pair of seabed images were overlain to measure the ripple migration rate M_r and migration direction M_{dir}. For wave ripples, the traced ripple crestlines will randomly cross each other and do not show clear migration. Though bedload transport is defined for these cases, net migration cannot be obtained. The measured ripple migration rates and ripple heights calculated from measured ripple lengths were then converted to bedform mass sediment transport rate from:

$$q_r = 0.5\rho_b H_r M_r \quad (2)$$

where ρ_b is the bottom sediment bulk density taken to be 1.8 g/cm^3. Due to the closeness of Sites 3 and 4 to the rig, drilling mud released from the platform was frequently observed to cover bedforms or cause poor visibility. No bed state classification and bedform measurements were made for these bursts.

The results of seabed image analysis are given in Appendix 7 which lists the following parameters for each time series:

time	-	in total hours
fm#	-	film frame number
bed	-	classification of bed states
C_r	-	current ripple crest orientation (degrees)
W_r	-	wave ripple crest orientation (degrees)
H_r	-	ripple height (cm), subscripts c and w indicate current and wave ripples
L_r	-	ripple wave length (cm)
M_r	-	ripple migration rate (cm/minute)
M_{dir}	-	ripple migration direction (degrees)
q_r	-	bedform-derived mass transport rate (10^{-3} kg m^{-1} s^{-1})

The following types of bed states are used in Appendix 7:

DM	drilling mud
NM	no motion
C	current ripples: C_s, straight-crested; C_l, linguoid
C_w	current-dominant ripples with secondary wave ripples
WC	wave and current ripples of equal magnitude
W_c	wave-dominant ripples with secondary current ripples
W	wave ripples
LWR	large wave ripples
SS	saltation/suspension
UPB	upper plane bed under sheet flow

Appendix 7 shows that at site 3 the measured bedform transport rates ranged from 0.0003 to 0.0006 kg m^{-1} s^{-1} during moderate storms, while the maximum observed transport rates reached about 0.001 kg m^{-1} s^{-1} during major storms. Bed state, near-bed wave orbital velocity u_b and mean current velocity u_{100} are plotted in Figure 6 as time series. From low to high levels of energy, the bed state is numbered as NM = 1, C and C_w = 2, WC = 3, W and W_c = 4, LWR = 5, SS = 6 and UPB = 7. Bed state numbers from 2 to 4 (i.e. various rippled beds before sand suspension) are also indicated as bedload state in Figure 6. Figure 6 shows good correlation between seabed states and wave-current dynamics. High transport stages, namely SS, UPB, and LWR, are mostly due to passages of storms when u_b was 0.4 m/s or higher. Suspension and LWR were also observed during moderate storms. During quiet periods when u_b was < 0.1 m/s , e.g. days 4-8 and 11-14, no sediment transport was observed even though peak u_{100} reached more than 0.2 m/s. This suggests that for the depth and grain size at Site 3, the mean current was generally not strong enough to cause bedload sediment transport. For moderate storms during days 9 and 33, u_b was smaller than 0.4 m/s for both events. However, u_{100} reached 0.45 m/s on day 33 while it was less than 0.1 m/s on day 9. The wave-dominant storm on day 9 only resulted in saltation/suspension transport, but upper-plane-bed sheet flow was observed during the storm on day 33 due to a stronger mean current. This shows the importance of wave-current interaction on the Scotian Shelf.

4.5 Predictions By SEDTRANS92

The mean sediment grain size, D, was 0.38 mm at site 3. The measured ripple heights in Appendix 7 were averaged to obtain the mean ripple height H_r = 1.7 cm for the entire deployment period. These

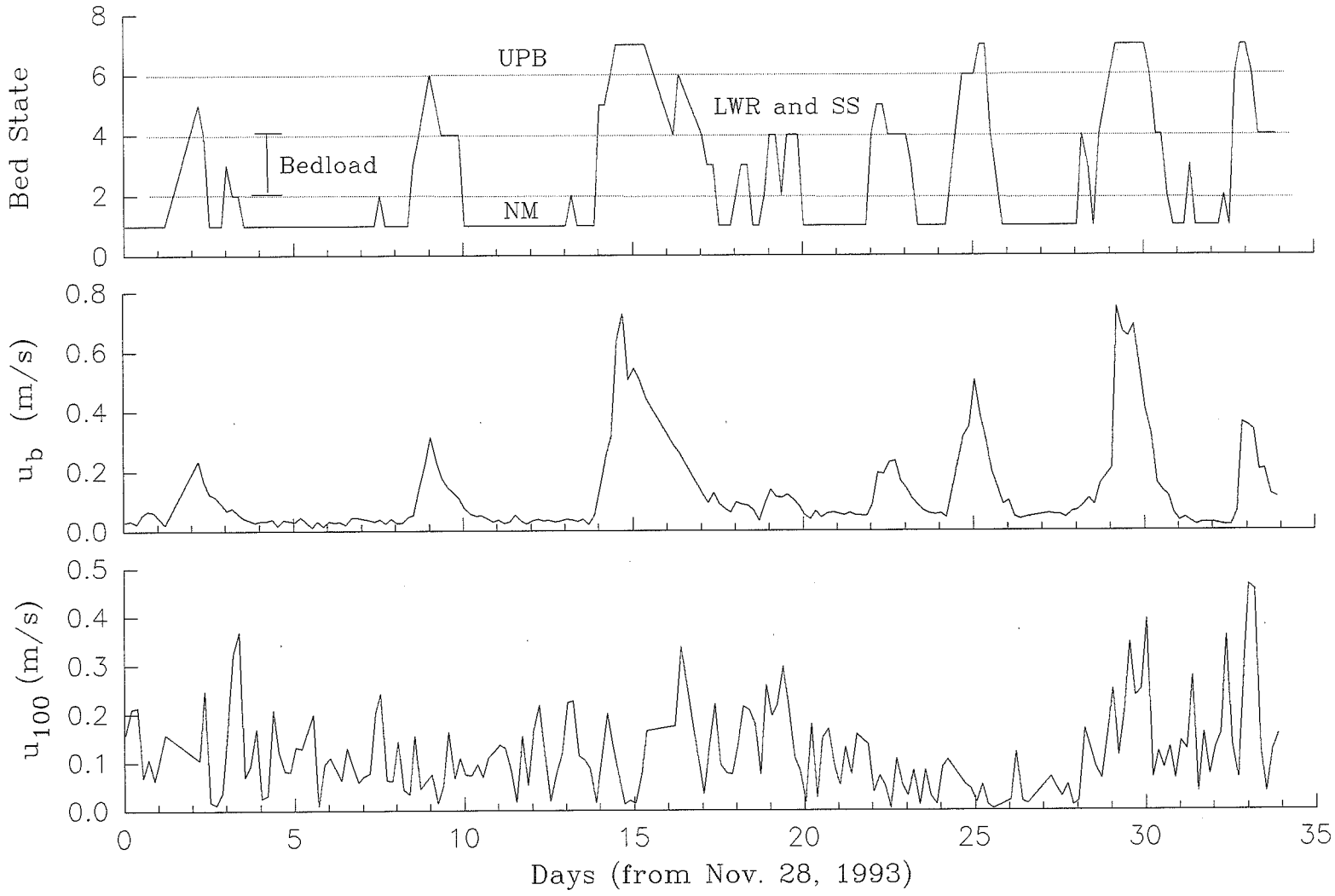

Figure 6 Time series plots of observed bed states, nearbed wave orbital velocity (u_b) and mean velocity u_{100} for Site 3. See text for numbers representing various bed states.

values of D, H_r, same values of grain size class fraction F, sediment and flow densities R_s and R_f as used for Site 2, and the wave-current raw data of Appendix 6 were used as the input data to run the sediment transport model SEDTRANS92. The model outputs are again divided into two parts as for Site 2: Appendix 8A lists the predicted bottom boundary layer parameters and Appendix 8B gives the predicted magnitude and direction of sediment transport using various formulae. Definitions of the parameters in Appendices 8A and 8B are the same as that in section 3.4 for Site 2 data. Appendix 8B shows that using the Einstein-Brown bedload formula, the predicted sediment transport rates during moderate storms were about 0.0001 - 0.0002 kg m^{-1} s^{-1} and that the predicted transport rates reached 0.006 - 0.05 kg m^{-1} s^{-1} during major storms.

5. DATA FROM SITE 4

5.1 Instrumentation and General Description

Site 4 was located northeast of the rig at Cohasset, also roughly at the centre of the study region (43^0 52.02'N, 60^0 36.75'W, Fig. 1). The water depth at Site 4 was about 36 meters. Instrumented tripods RALPH and SOBS were deployed at Site 4 from March 7 to April 29, 1994. No S4 wave-current meters were deployed at this site. One bottom sediment sample was also collected at the RALPH location using the van Veen grab sampler. The top few mm of the sample was composed of well-sorted medium sand with a mean grain size of 0.31 mm. Sediment grain size then became coarser beneath to reach about 0.35 mm from 1 to 12 cm. Plots and detailed grain size data are again given in Appendix 1.

5.2 RALPH Wave-Current and Sediment Suspension Data

RALPH recorded data from 7/3/93 to 29/4/94 for a total of 53 days. The instrumentation, sensor heights and sampling strategy were kept the same as that in Site 3 deployment. Details of these can be found in section 4.3. SOBS failed to record any data at this site.

For each time series, the data was again averaged to obtain the mean water depth (h), mean current velocities at 0.5 and 1.0 m above the bottom (u_{50} and u_{100}), current direction for u_{100} (C_{dir}), and mean water attenuations (%) at 0.33 and 0.68 m heights (C_{33} and C_{68}). Martec Limited was also contracted to process

the data to derive wave parameters (Martec Ltd., 1995). The method of how to obtain significant wave height H_s, wave period T_p and wave propagation direction W_{dir} is described in section 4.3. The measured wave-current data of h, u_{100}, z (height of mean current measurement), C_{dir}, H_s, T_p, W_{dir}, C_{33} and C_{68} are listed in Appendix 9 for all the bursts recorded by RALPH at Site 4. Time series of h, u_{100}, H_s, T_p, and C_{68} are plotted in Figure 7. Appendix 9 shows that the reading of the lower transmissometer (at 33 cm above the bottom) dropped sharply from >90% to nearly 0% at hour 3:00 on April 5th. This may indicate malfunctioning of this sensor. Figure 7 shows that four spring tides and three neap tides occurred during the deployment at Site 4. The mean currents ranged from 0.25 to 0.45 m/s during spring tides, while the mean current velocity was generally less than 0.2 m/s during the neap tides. Though there were several small storms during the deployment period, only one major storm with H_s of ~3 m was encountered on Julian day 71. The time series of the water attenuation (C_{68}) shows peculiar variations. Though some peaks correlated with storm events, many strong peaks occurred when both waves and mean currents were weak (peaks during days 94-97 and 111-115). Again we believe that these peaks were due to the release of drilling mud from the rig.

5.3 RALPH Seabed Image Data

A total of 2734 seabed photos were taken at Site 4 by the RALPH camera and these correlated with 318 wave-current time series. The same document viewer as for Site 3 data was used to analyze these seabed images. Similarly as for Site 3 images, each burst-correlated pair of images was directly analyzed for seabed state classification, ripple orientation, ripple geometry and ripple migration rate measurements. The clearness of the image in combination with migrating ripples or ripple pattern change defines bedload transport. The general deterioration of image clarity marks the initiation of saltation/suspension, while the combination of strong image blurring and clearly-recognizable flat bed indicates the upper-plane bed sheet flow conditions. For each image, ripple wavelength L_r was directly measured by referencing to the scales on the shadow wire. Ripple heights were again calculated using equation 1 and $H_r = 0.13L_r$ as given in section 4.4 since the shadow wire was buried for most of the deployment period. The ripple crest lines were traced on to a mylar template and the tracings from each related pair of seabed images were overlain to measure the ripple migration rate M_r and migration direction M_{dir}. The ASCII data file of RALPH indicates that starting from April 10th, only one photo was taken by the RALPH camera for each data burst (at the end of each time series). Thus a longer duration of 30 minutes was used to obtain the ripple migration rates M_r for these bursts. The measured ripple heights and migration rates were then used in

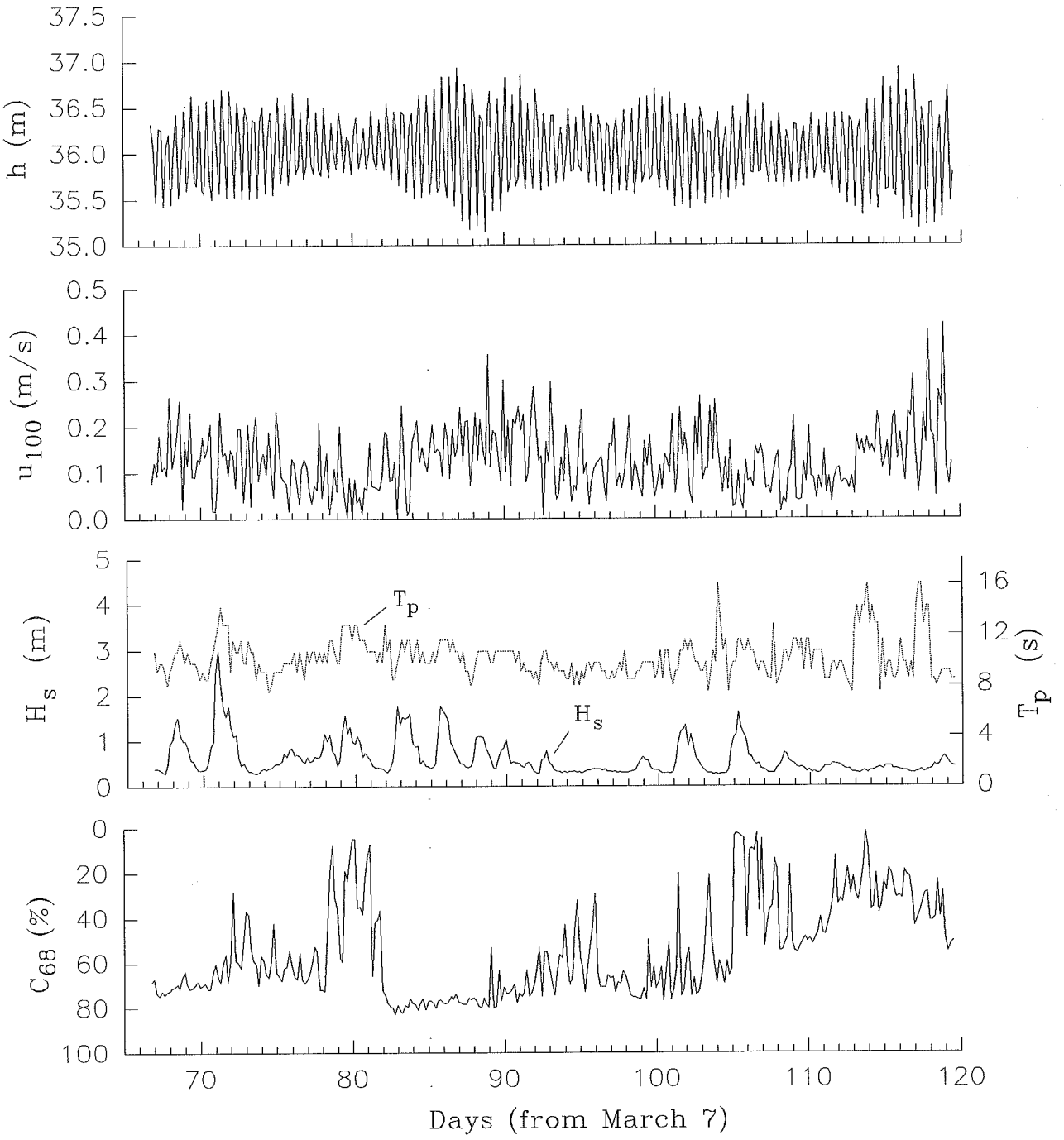

Figure 7 Overview of Site 4 RALPH data showing the time series plots of water depth (h), mean velocity (u_{100}), significant wave height (H_s), spectral peak wave period (T_p) and transmission % at 68 cm above the seabed (C_{68}).

equation 2 to calculate the bedform transport rates q_r. Drilling mud was also observed in some bursts for Site 4 data and again no bed state classification and bedform measurements were made for these bursts.

The results of seabed image analysis for Site 4 are listed in Appendix 10. The parameters and bed states in Appendix 10 are defined in the same way as those in Appendix 7 (see section 4.4 for explanations). The measured bedform transport rates during storms were about 0.0006 kg m^{-1} s^{-1}. The time series of bed state, near-bed wave orbital velocity u_b and mean current velocity u_{100} are plotted in Figure 8. The bed state is again numbered from 1 to 7 as energy level increases from low to high (see Fig. 6) and bed state numbers from 2 to 4 are defined as bedload transport mode. Figure 8 shows that high sediment transport stages again coincided with storm events when wave orbital velocity u_b was higher than 0.2 m/s. But this late-winter to early-spring deployment was generally less energetic than the Site 3 deployment. Upper-plane bed sheet flow was observed only in one storm and sediment suspension was observed only briefly for two storms. Most of the seabed images showed bedload transport over rippled bed (bed state number ≤ 4).

5.4 Predictions By SEDTRANS92

The mean sediment grain size, D, was 0.31 mm at site 4. The ripple heights calculated from the measured ripple lengths were averaged to obtain the mean ripple height H_r = 1.8 cm for the entire deployment period. These values of D, H_r, same values of grain size class fraction F, sediment and flow densities R_s and R_f as used for Site 2, and the wave-current raw data of Appendix 9 were used as the input data to run the sediment transport model SEDTRANS92 to predict boundary layer dynamics and sediment transport. The model-predicted bottom boundary layer parameters are listed in Appendix 11A. Sediment transport rates and directions predicted by the model are given in Appendix 11B. Definitions of the parameters in Appendices 11A and 11B are the same as in section 3.4 for Site 2 data. Appendix 11B indicates that based on the Einstein-Brown formula, the predicted sediment transport rates reached 0.004 kg m^{-1} s^{-1} during the moderate storms recorded at Site 4.

6. CSS HUDSON CRUISE 95-033A

A multi-purpose survey of the Cohasset/Panuke development region was conducted on board CSS

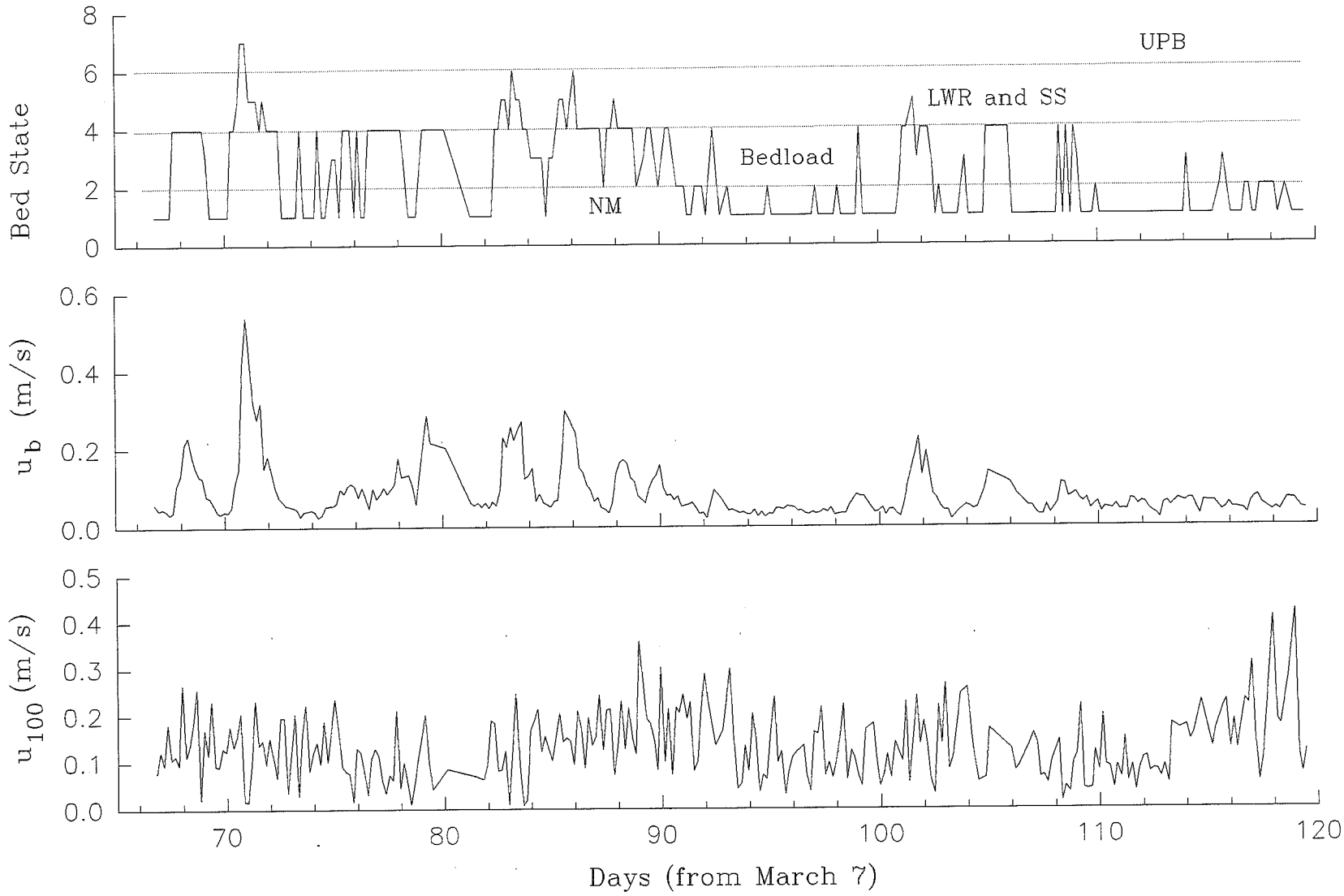

Figure 8 Time series plots of observed bed states, nearbed wave orbital velocity (u_b) and mean velocity u_{100} for Site 4. See text for numbers representing various bed states.

Hudson from 15 to 22 November, 1995 (Amos et al., 1996). The overall objectives of the cruise were to collect geological, geophysical and sediment dynamics data in the Cohasset/Panuke region so that the processes of sediment transport, large-scale bedform genesis and stability and seabed reworking due to the migration of these bedforms can be linked together. RALPH2 was deployed at a deep site (60 m depth) over fine sand and left there to be recovered in December of 1995. The expanded RALPH3, with 2D-DODO being mounted on the quadrapod, was deployed in 40 m depth from 16 to 19 of November 16 for testing. Most sensors were found to have worked properly. With minor reprogramming, it was re-deployed on 19 November and left there to be recovered in December. A total of 23 IKU and van Veen grab samples were collected to provide data on sediment grain size, sedimentary structures and the depth of the mobile layer. Eleven camera stations were occupied to obtain seabed photos. One anchor station was also carried out at which sediment traps were deployed 14 times to measure sediment transport rates at this station. A total of 270 km of seismic and side-scan sonar data were collected to define the bedforms and morphology of the region. The details of the CSS Hudson 95-033A Cruise can be found in the GSCA Open File Report by Amos et al. (1996).

7. SUMMARY

In summary, 12 cruises were conducted during the period from 28 February 1993 to the end of 1995 in this hydrodynamics and seabed stability joint project between GSCA and LASMO. GSCA instrumentation packages of RALPH, SOBS, DODO, S4 current meters and Helley-Smith sediment traps were deployed 23 times. These cruises covered five sites for which the depths ranged from 27 m to 62 m and sediment grain size ranged from fine sand to medium/coarse sands. A total of 104 bottom/trap sediment samples were obtained and 35 camera/vibrocore stations were occupied in this period. One hundred and three hours of seismic profiling/sidescan sonar survey were completed. Through these deployments, five data sets were collected on waves, currents, suspended sediment concentrations and seabed responses. Data collected at Sites 2, 3, and 4 have been processed and analyzed. Five major storms and numerous moderate storms were recorded by our instruments. The significant wave height H_s and wave period T_p reached more than 3 m and 15 s during the major storms, while H_s and T_p were generally 1 - 3 m and 12 - 13 s during the moderate storms. Sand suspension, sheet-flow upper plane beds and large-wave ripples (L_r of ~60 cm and H_r of ~7 cm) were observed during the major storms. Only sand suspension and large wave ripples were observed during moderate storms. The measured bedform transport

rates ranged from 0.0003 to 0.0006 kg m^{-1} s^{-1} during moderate storms and the maximum bedform transport rates observed in major storms reached 0.0012 kg m^{-1} s^{-1}. Using the Einstein-Brown formula, SEDTRANS92 predicted that sediment transport rates are 0.0002 to 0.004 kg m^{-1} s^{-1} for moderate storms, and 0.007 to 0.05 kg m^{-1} s^{-1} for major storms at these sites. The large difference between the observed and predicted sediment transport rates during major storms is due to the wash-out of ripples and sediment transport in sheet flows which cannot be measured using the ripple migration method. The data collected during the periods of 1993/94 and 1994/95 will significantly improve our understanding of the free stream bottom boundary layer dynamics and the sediment transport pattern at the LASMO production site. We have also begun to examine the issue of genesis and stability of large scale bedforms on Sable Island Bank. All of these will significantly improve our modelling and predictive ability for free-stream storm sediment transport and scouring on an exposed high-energy continental shelf. These will form the foundation for the eventual monitoring and prediction of sediment transport and seabed scour around seabed installations.

Acknowledgements

We would like to thank Cal Ross, all the shorebase personnel and ship crews of LASMO for their corporation during this joint project. The effort of CSS Hudson crew was also appreciated. Special thanks go to Steve Solomon for his help in the analysis of seabed photos and his informational discussions, and to Don Clattenburg for sediment grain size analysis. We also acknowledge the assistance of Angus Robertson and David Lintern in field activities and seabed photo analyses. The reviews of the draft of this report by Harold Christian and Gary Sonnichsen have improved this Open File Report. The funding of this project was provided by the Panel on Energy Research and Development (PERD) of the Federal Government of Canada through the Offshore Geotechnics Program 63204.

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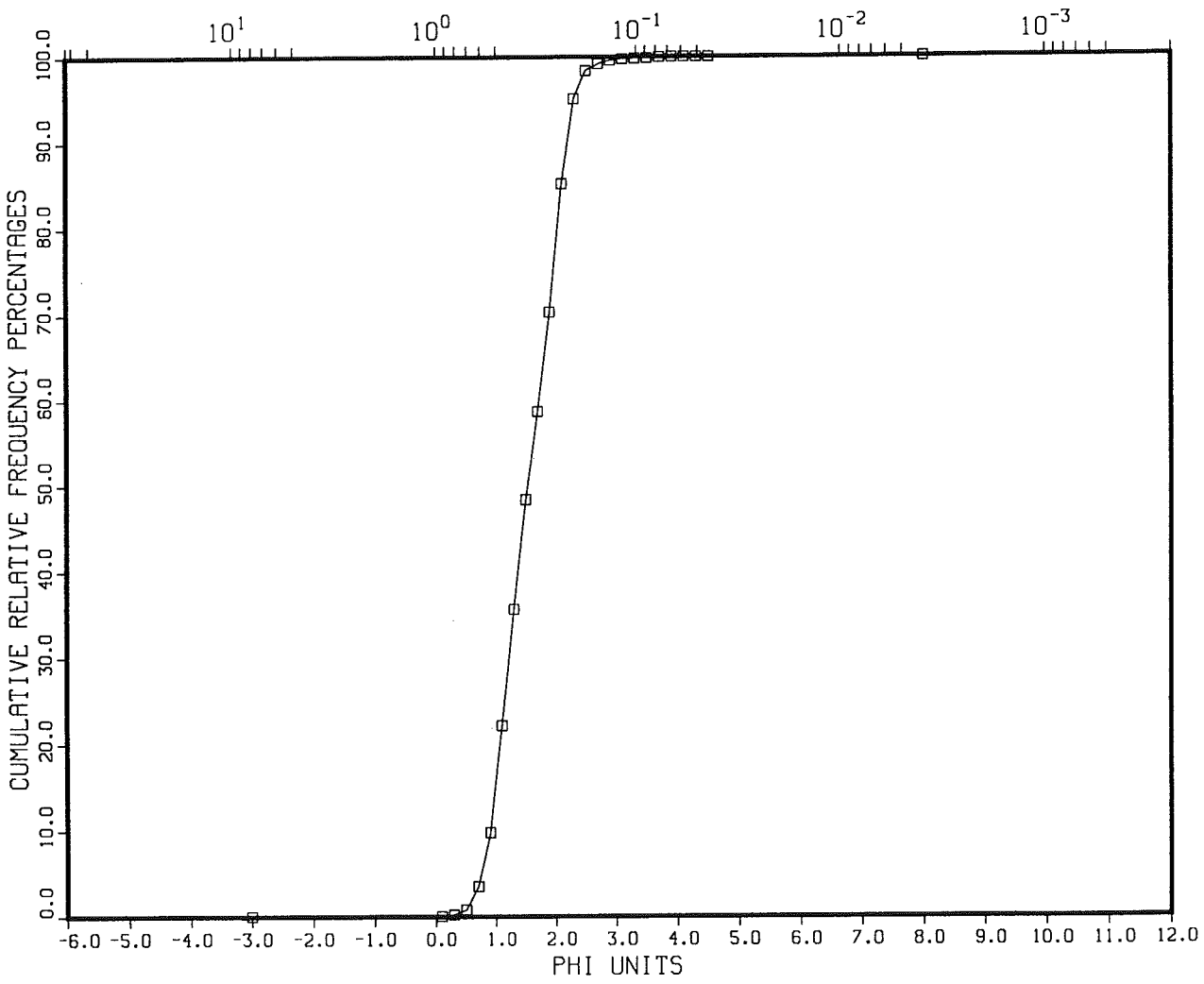
Appendix 1

Bottom sediment grain size data for Site 2 (RD008440), Site 3 (RD008948), and Site 4 (RD009033). For each sediment sample, the tabulated and graphical results of grain size analysis are given.

93502-SOBS SITE 2,RD008440,
,00107,

Carl Amos
SIB 93



CALCULATION RESULTS FOR
THE SAMPLE WITH THE IDENTIFIER:

93502-SOBS SITE 2,RD008440,
,00107,

Carl Amos
SIB 93

RESULTS

MIDPOINTS MM	MIDPOINTS PHI	RELATIVE FREQUENCY PERCENTAGES	CUMULATIVE FREQUENCY PERCENTAGES
8.0	-3.00	0.06	0.06
.93	0.10	0.01	0.06
.81	0.30	0.16	0.23
.71	0.50	0.57	0.79
.62	0.70	2.73	3.52
.54	0.90	6.25	9.77
.47	1.10	12.43	22.20
.41	1.30	13.49	35.68
.35	1.50	12.76	48.45
.31	1.70	10.30	58.75
.27	1.90	11.63	70.38
.23	2.10	14.95	85.33
.20	2.30	9.82	95.14
.18	2.50	3.26	98.40
.15	2.70	0.77	99.17
.13	2.90	0.41	99.58
.12	3.10	0.17	99.75
.10	3.30	0.06	99.81
.88E-01	3.50	0.04	99.86
.77E-01	3.70	0.10	99.96
.67E-01	3.90	0.04	100.00
.58E-01	4.10	0.00	100.00
.51E-01	4.30	0.00	100.00
.44E-01	4.50	0.00	100.00
.39E-02	8.00	0.00	100.00

GRAIN SIZE BREAKDOWN

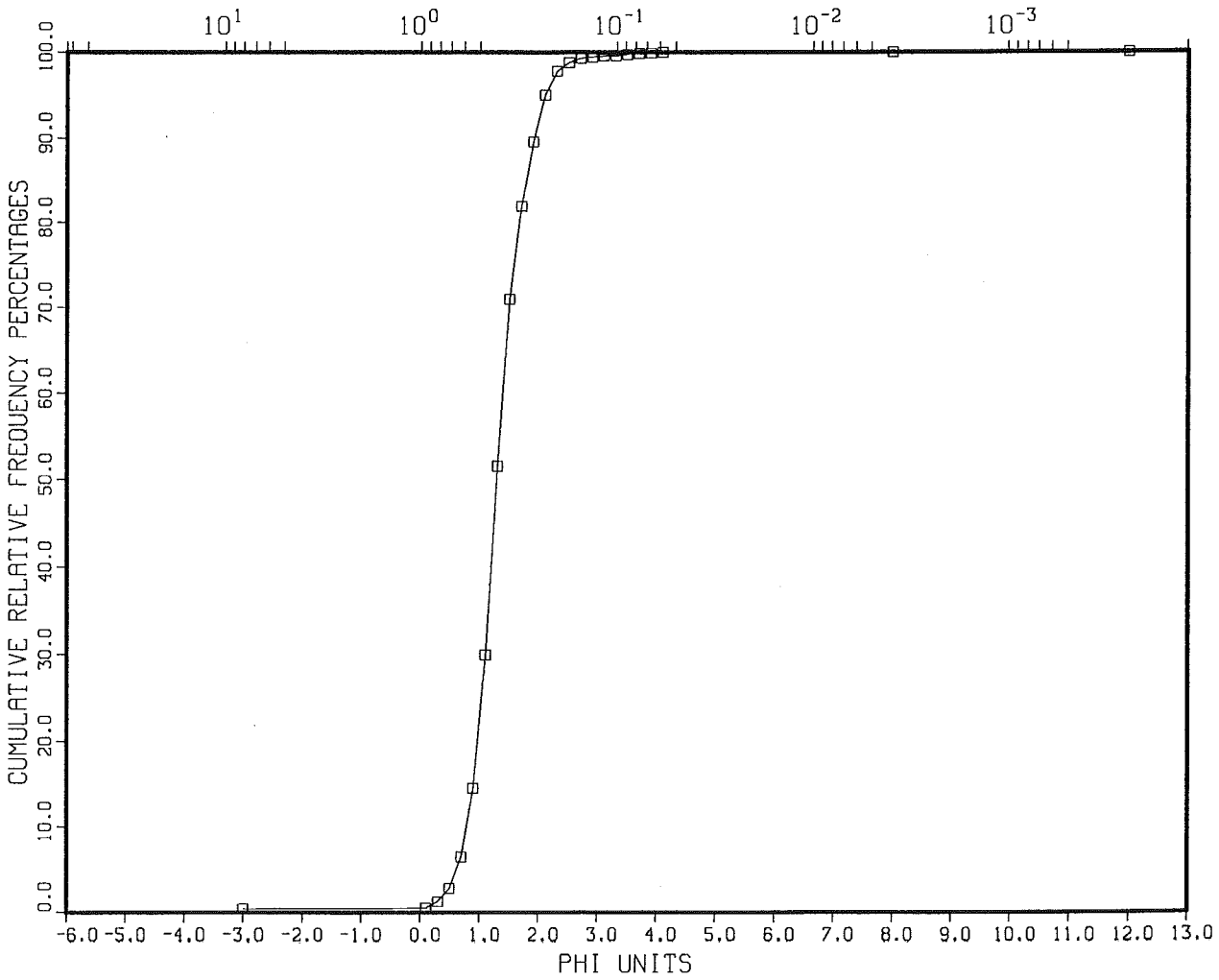
% GRAVEL	% SAND	% MUD
0.06	99.94	0.00

STATISTICAL MEASURES

MEAN (PHI)	STANDARD DEVIATION (PHI)	KURTOSIS (NO DIM.)	SKEWNESS (NO DIM.)
1.64	0.52	6.20	-0.29

93505-002-SS,RD008948, Dr. Carl Amos

,00165, Sable Island Bank - Copan



CALCULATION RESULTS FOR
THE SAMPLE WITH THE IDENTIFIER:

93505-002-SS,RD008948, Dr. Carl Amos
,00165, Sable Island Bank - Copan

RESULTS

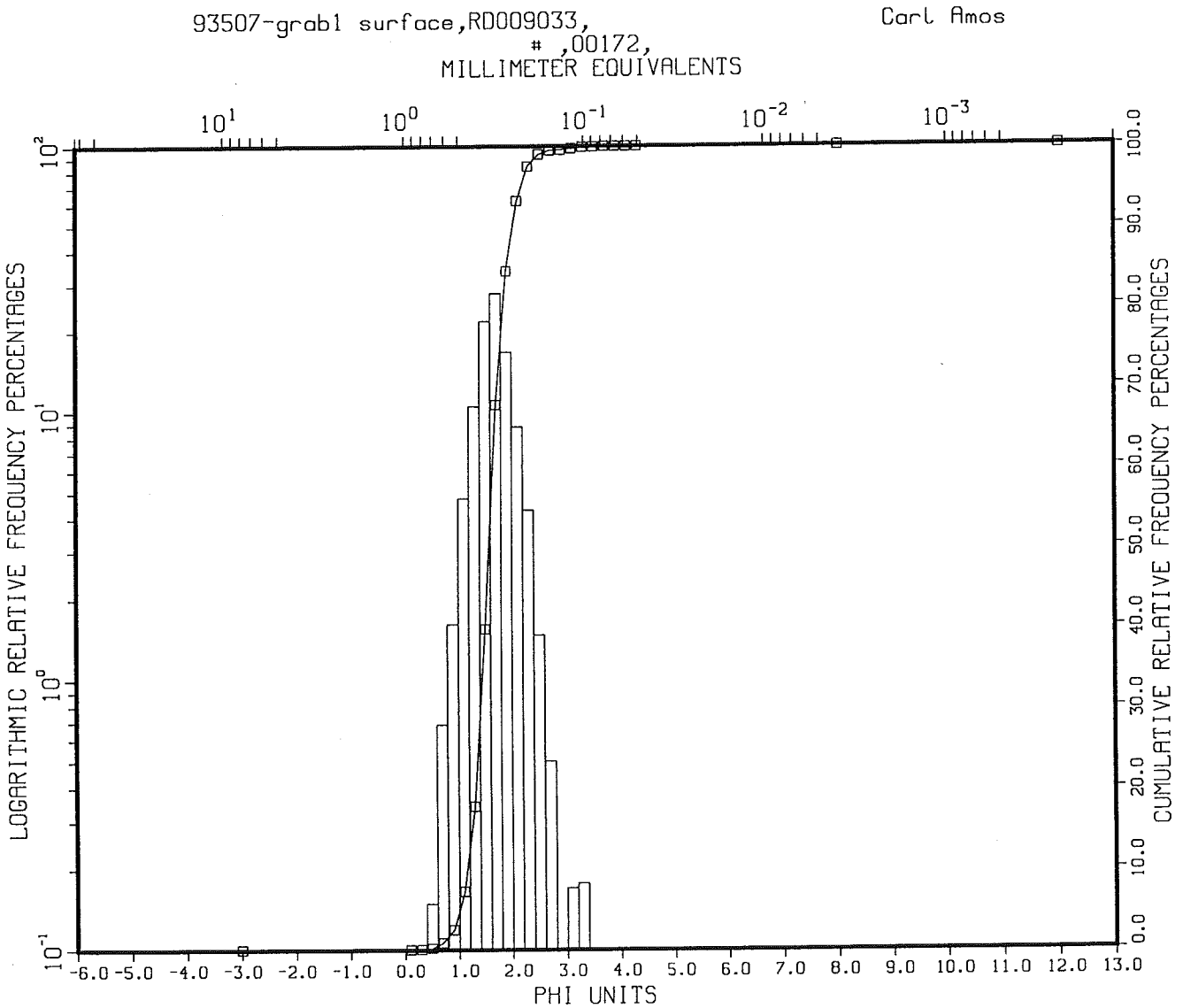
MIDPOINTS MM	MIDPOINTS PHI	RELATIVE FREQUENCY PERCENTAGES	CUMULATIVE FREQUENCY PERCENTAGES
8.0	-3.00	0.41	0.41
.93	0.10	0.09	0.49
.81	0.30	0.77	1.26
.71	0.50	1.54	2.81
.62	0.70	3.74	6.55
.54	0.90	7.89	14.44
.47	1.10	15.48	29.92
.41	1.30	21.61	51.53
.35	1.50	19.46	70.99
.31	1.70	10.94	81.93
.27	1.90	7.65	89.58
.23	2.10	5.43	95.00
.20	2.30	2.75	97.75
.18	2.50	1.02	98.77
.15	2.70	0.51	99.28
.13	2.90	0.17	99.45
.12	3.10	0.09	99.54
.10	3.30	0.02	99.56
.88E-01	3.50	0.18	99.74
.77E-01	3.70	0.11	99.85
.67E-01	3.90	0.04	99.89
.58E-01	4.10	0.11	100.00
.39E-02	8.00	0.00	100.00
.24E-03	12.00	0.00	100.00

GRAIN SIZE BREAKDOWN

% GRAVEL	% SAND	% SILT	% CLAY	% MUD
0.41	99.48	0.11	0.00	0.11

STATISTICAL MEASURES

MEAN (PHI)	STANDARD DEVIATION (PHI)	KURTOSIS (NO DIM.)	SKEWNESS (NO DIM.)
1.41	0.54	21.70	-1.69


93507-grab1 surface,RD009033,
,00172,
Carl Amos
MILLIMETER EQUIVALENTS
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-3}
LOGARITHMIC RELATIVE FREQUENCY PERCENTAGES
10^{2}
10^{1}
10^{0}
10^{-1}
CUMULATIVE RELATIVE FREQUENCY PERCENTAGES
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
-6.0 -5.0 -4.0 -3.0 -2.0 -1.0 0.0 1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0 9.0 10.0 11.0 12.0 13.0
PHI UNITS

CALCULATION RESULTS FOR
THE SAMPLE WITH THE IDENTIFIER:

93507-grab1 surface,RD009033, Carl Amos
,00172,$

RESULTS

MIDPOINTS MM	MIDPOINTS PHI	RELATIVE FREQUENCY PERCENTAGES	CUMULATIVE FREQUENCY PERCENTAGES
8.0	-3.00	0.04	0.04
.93	0.10	0.01	0.05
.81	0.30	0.02	0.07
.71	0.50	0.15	0.22
.62	0.70	0.68	0.90
.54	0.90	1.62	2.52
.47	1.10	4.77	7.29
.41	1.30	10.50	17.79
.35	1.50	21.90	39.69
.31	1.70	27.90	67.60
.27	1.90	16.75	84.35
.23	2.10	8.81	93.16
.20	2.30	4.32	97.48
.18	2.50	1.47	98.96
.15	2.70	0.50	99.46
.13	2.90	0.07	99.54
.12	3.10	0.17	99.71
.10	3.30	0.18	99.88
.88E-01	3.50	0.04	99.93
.77E-01	3.70	0.07	100.00
.67E-01	3.90	0.00	100.00
.58E-01	4.10	0.00	100.00
.51E-01	4.30	0.00	100.00
.39E-02	8.00	0.00	100.00
.24E-03	12.00	0.00	100.00

GRAIN SIZE BREAKDOWN

% GRAVEL	% SAND	% SILT	% CLAY	% MUD
0.04	99.96	0.00	0.00	0.00

STATISTICAL MEASURES

MEAN (PHI)	STANDARD DEVIATION (PHI)	KURTOSIS (NO DIM.)	SKEWNESS (NO DIM.)
1.68	0.37	15.89	-0.49

Appendix 2

List of wave-current and SEDTRANS92 input data for Site 2: Day, Hour, total time (hour), water depth (h, m), mean velocity (u_{50}, m/s), velocity measurement height (z, m), mean current direction (C_{dir}), significant wave height (H_s, m), wave period (T_p, s), wave propagation direction W_{dir}, sediment mean grain size (D, m), mean ripple height (H_r, m), grain size class fraction F, sediment and flow densities (R_s and R_f, kg/m^3).

Day	Hour	time	h	u50	z	Cdir	Hs	Tp	Wdir	D	Hr	F	Rs	Rf
58	2	1	56.62	0.014	0.5	117	0.154	10.7	276	0.00032	0.013	1	2650	1025
58	4	3	56.58	0.098	0.5	184	0.125	10.7	77	0.00032	0.013	1	2650	1025
58	6	5	56.17	0.093	0.5	203	0.121	9.1	23	0.00032	0.013	1	2650	1025
58	8	7	55.80	0.081	0.5	242	0.139	10.7	6	0.00032	0.013	1	2650	1025
58	10	9	55.75	0.100	0.5	303	0.111	10.7	16	0.00032	0.013	1	2650	1025
58	12	11	56.06	0.085	0.5	326	0.124	10.7	14	0.00032	0.013	1	2650	1025
58	14	13	56.45	0.005	0.5	284	0.092	10.7	338	0.00032	0.013	1	2650	1025
58	16	15	56.47	0.096	0.5	193	0.108	12.8	346	0.00032	0.013	1	2650	1025
58	18	17	56.13	0.123	0.5	207	0.090	10.7	337	0.00032	0.013	1	2650	1025
58	20	19	55.79	0.108	0.5	243	0.106	10.7	1	0.00032	0.013	1	2650	1025
58	22	21	55.74	0.094	0.5	273	0.120	10.7	283	0.00032	0.013	1	2650	1025
59	0	23	56.05	0.110	0.5	317	0.092	10.7	339	0.00032	0.013	1	2650	1025
59	2	25	56.50	0.049	0.5	348	0.112	10.7	325	0.00032	0.013	1	2650	1025
59	4	27	56.63	0.076	0.5	179	0.109	10.7	321	0.00032	0.013	1	2650	1025
59	6	29	56.35	0.095	0.5	198	0.121	12.8	356	0.00032	0.013	1	2650	1025
59	8	31	55.96	0.116	0.5	218	0.146	12.8	314	0.00032	0.013	1	2650	1025
59	10	33	55.79	0.094	0.5	261	0.211	12.8	338	0.00032	0.013	1	2650	1025
59	12	35	55.96	0.095	0.5	304	0.222	10.7	313	0.00032	0.013	1	2650	1025
59	14	37	56.33	0.045	0.5	303	0.284	10.7	301	0.00032	0.013	1	2650	1025
59	16	39	56.52	0.047	0.5	258	0.623	9.1	301	0.00032	0.013	1	2650	1025
59	18	41	56.28	0.143	0.5	275	0.728	9.1	299	0.00032	0.013	1	2650	1025
59	20	43	55.96	0.213	0.5	276	1.079	10.7	305	0.00032	0.013	1	2650	1025
59	22	45	55.84	0.274	0.5	294	1.471	10.7	301	0.00032	0.013	1	2650	1025
60	0	47	55.99	0.239	0.5	315	2.305	12.8	304	0.00032	0.013	1	2650	1025
60	2	49	56.47	0.251	0.5	334	2.518	12.8	320	0.00032	0.013	1	2650	1025
60	4	51	56.70	0.046	0.5	314	3.181	12.8	325	0.00032	0.013	1	2650	1025
60	6	53	56.56	0.028	0.5	183	2.976	16.0	1	0.00032	0.013	1	2650	1025
60	8	55	56.18	0.029	0.5	205	2.720	16.0	353	0.00032	0.013	1	2650	1025
60	10	57	55.91	0.026	0.5	200	2.227	12.8	8	0.00032	0.013	1	2650	1025
60	12	59	55.92	0.021	0.5	165	2.431	12.8	18	0.00032	0.013	1	2650	1025
60	14	61	56.18	0.026	0.5	98	2.438	12.8	22	0.00032	0.013	1	2650	1025
60	16	63	56.41	0.040	0.5	153	1.724	12.8	31	0.00032	0.013	1	2650	1025
60	18	65	56.34	0.102	0.5	171	1.306	12.8	24	0.00032	0.013	1	2650	1025
60	20	67	56.04	0.059	0.5	207	1.244	12.8	19	0.00032	0.013	1	2650	1025
60	22	69	55.81	0.050	0.5	239	0.854	12.8	5	0.00032	0.013	1	2650	1025
61	0	71	55.81	0.053	0.5	278	1.130	12.8	1	0.00032	0.013	1	2650	1025
61	2	73	56.13	0.082	0.5	334	0.744	10.7	351	0.00032	0.013	1	2650	1025
61	4	75	56.51	0.011	0.5	20	0.760	10.7	347	0.00032	0.013	1	2650	1025
61	6	77	56.57	0.028	0.5	147	0.652	12.8	333	0.00032	0.013	1	2650	1025
61	8	79	56.34	0.029	0.5	163	0.687	10.7	331	0.00032	0.013	1	2650	1025
61	10	81	56.02	0.020	0.5	209	0.524	12.8	347	0.00032	0.013	1	2650	1025
61	12	83	55.86	0.007	0.5	349	0.493	12.8	337	0.00032	0.013	1	2650	1025
61	14	85	56.01	0.068	0.5	44	0.461	12.8	331	0.00032	0.013	1	2650	1025
61	16	87	56.31	0.067	0.5	101	0.479	12.8	331	0.00032	0.013	1	2650	1025

Day	Hour	time	h	u50	z	Cdir	Hs	Tp	Wdir	D	Hr	F	Rs	Rf
61	18	89	56.43	0.060	0.5	169	0.480	12.8	321	0.00032	0.013	1	2650	1025
61	20	91	56.27	0.055	0.5	185	0.488	12.8	324	0.00032	0.013	1	2650	1025
61	22	93	56.03	0.028	0.5	198	0.407	12.8	328	0.00032	0.013	1	2650	1025
62	0	95	55.86	0.025	0.5	212	0.562	12.8	325	0.00032	0.013	1	2650	1025
62	2	97	55.98	0.018	0.5	263	0.566	12.8	314	0.00032	0.013	1	2650	1025
62	4	99	56.39	0.035	0.5	306	0.657	12.8	319	0.00032	0.013	1	2650	1025
62	6	101	56.66	0.016	0.5	189	0.685	12.8	313	0.00032	0.013	1	2650	1025
62	8	103	56.58	0.025	0.5	202	0.444	12.8	321	0.00032	0.013	1	2650	1025
62	10	105	56.26	0.026	0.5	150	0.782	12.8	327	0.00032	0.013	1	2650	1025
62	12	107	55.95	0.017	0.5	191	0.922	12.8	323	0.00032	0.013	1	2650	1025
62	14	109	55.92	0.019	0.5	226	0.661	12.8	326	0.00032	0.013	1	2650	1025
62	16	111	56.16	0.021	0.5	90	0.733	12.8	330	0.00032	0.013	1	2650	1025
62	18	113	56.42	0.048	0.5	161	0.841	12.8	321	0.00032	0.013	1	2650	1025
62	20	115	56.43	0.039	0.5	195	1.045	12.8	322	0.00032	0.013	1	2650	1025
62	22	117	56.21	0.034	0.5	200	0.717	12.8	329	0.00032	0.013	1	2650	1025
63	0	119	55.92	0.030	0.5	229	0.739	12.8	322	0.00032	0.013	1	2650	1025
63	2	121	55.85	0.035	0.5	272	0.686	12.8	321	0.00032	0.013	1	2650	1025
63	4	123	56.16	0.096	0.5	17	0.567	12.8	327	0.00032	0.013	1	2650	1025
63	6	125	56.55	0.036	0.5	43	0.450	12.8	318	0.00032	0.013	1	2650	1025
63	8	127	56.67	0.088	0.5	92	0.548	12.8	330	0.00032	0.013	1	2650	1025
63	10	129	56.49	0.059	0.5	150	0.341	12.8	319	0.00032	0.013	1	2650	1025
63	12	131	56.09	0.024	0.5	204	0.319	10.7	316	0.00032	0.013	1	2650	1025
63	14	133	55.81	0.024	0.5	235	0.320	10.7	330	0.00032	0.013	1	2650	1025
63	16	135	55.94	0.089	0.5	22	0.337	10.7	312	0.00032	0.013	1	2650	1025
63	18	137	56.31	0.025	0.5	159	0.325	10.7	325	0.00032	0.013	1	2650	1025
63	20	139	56.50	0.059	0.5	184	0.236	10.7	324	0.00032	0.013	1	2650	1025
63	22	141	56.39	0.060	0.5	195	0.298	10.7	316	0.00032	0.013	1	2650	1025
64	0	143	56.03	0.059	0.5	215	0.202	10.7	332	0.00032	0.013	1	2650	1025
64	2	145	55.73	0.056	0.5	250	0.219	10.7	330	0.00032	0.013	1	2650	1025
64	4	147	55.85	0.107	0.5	332	0.213	10.7	317	0.00032	0.013	1	2650	1025
64	6	149	56.32	0.011	0.5	253	0.222	10.7	318	0.00032	0.013	1	2650	1025
64	8	151	56.69	0.012	0.5	271	0.201	10.7	312	0.00032	0.013	1	2650	1025
64	10	153	56.67	0.039	0.5	128	0.237	10.7	311	0.00032	0.013	1	2650	1025
64	12	155	56.28	0.061	0.5	174	0.210	10.7	313	0.00032	0.013	1	2650	1025
64	14	157	55.79	0.032	0.5	241	0.207	10.7	306	0.00032	0.013	1	2650	1025
64	16	159	55.72	0.072	0.5	322	0.208	10.7	322	0.00032	0.013	1	2650	1025
64	18	161	56.12	0.043	0.5	356	0.202	10.7	303	0.00032	0.013	1	2650	1025
64	20	163	56.53	0.068	0.5	209	0.198	10.7	326	0.00032	0.013	1	2650	1025
64	22	165	56.62	0.092	0.5	210	0.251	9.1	329	0.00032	0.013	1	2650	1025
65	0	167	56.30	0.138	0.5	220	0.253	9.1	317	0.00032	0.013	1	2650	1025
65	2	169	55.83	0.155	0.5	243	0.373	9.1	320	0.00032	0.013	1	2650	1025
65	4	171	55.67	0.246	0.5	292	0.604	10.7	318	0.00032	0.013	1	2650	1025
65	6	173	56.10	0.238	0.5	324	0.670	10.7	306	0.00032	0.013	1	2650	1025
65	8	175	56.68	0.215	0.5	345	0.859	10.7	298	0.00032	0.013	1	2650	1025

Day	Hour	time	h	u50	z	Cdir	Hs	Tp	Wdir	D	Hr	F	Rs	Rf
65	10	177	56.91	0.021	0.5	328	1.179	10.7	299	0.00032	0.013	1	2650	1025
65	12	179	56.61	0.040	0.5	205	1.603	10.7	313	0.00032	0.013	1	2650	1025
65	14	181	56.02	0.087	0.5	276	1.879	12.8	299	0.00032	0.013	1	2650	1025
65	16	183	55.67	0.131	0.5	297	2.183	12.8	303	0.00032	0.013	1	2650	1025
65	18	185	55.89	0.198	0.5	326	2.091	12.8	298	0.00032	0.013	1	2650	1025
65	20	187	56.46	0.156	0.5	345	1.585	12.8	305	0.00032	0.013	1	2650	1025
65	22	189	56.80	0.054	0.5	3	1.972	12.8	298	0.00032	0.013	1	2650	1025
66	0	191	56.55	0.036	0.5	195	1.536	12.8	307	0.00032	0.013	1	2650	1025
66	2	193	55.95	0.031	0.5	196	1.492	12.8	305	0.00032	0.013	1	2650	1025
66	4	195	55.51	0.007	0.5	22	1.408	12.8	304	0.00032	0.013	1	2650	1025
66	6	197	55.65	0.024	0.5	6	1.351	12.8	308	0.00032	0.013	1	2650	1025
66	8	199	56.29	0.078	0.5	53	0.764	12.8	307	0.00032	0.013	1	2650	1025
66	10	201	56.78	0.062	0.5	105	0.912	12.8	289	0.00032	0.013	1	2650	1025
66	12	203	56.67	0.089	0.5	140	1.068	10.7	338	0.00032	0.013	1	2650	1025
66	14	205	56.04	0.065	0.5	116	0.914	12.8	308	0.00032	0.013	1	2650	1025
66	16	207	55.44	0.047	0.5	113	1.102	12.8	345	0.00032	0.013	1	2650	1025
66	18	209	55.42	0.060	0.5	38	0.853	12.8	45	0.00032	0.013	1	2650	1025
66	20	211	56.03	0.101	0.5	70	0.986	10.7	54	0.00032	0.013	1	2650	1025
66	22	213	56.66	0.090	0.5	128	0.591	10.7	48	0.00032	0.013	1	2650	1025
67	0	215	56.68	0.150	0.5	148	0.746	10.7	55	0.00032	0.013	1	2650	1025
67	2	217	56.12	0.105	0.5	154	0.792	10.7	65	0.00032	0.013	1	2650	1025
67	4	219	55.47	0.258	0.5	189	0.629	10.7	60	0.00032	0.013	1	2650	1025
67	6	221	55.33	0.073	0.5	259	0.512	10.7	57	0.00032	0.013	1	2650	1025
67	8	223	55.88	0.095	0.5	3	0.534	10.7	61	0.00032	0.013	1	2650	1025
67	10	225	56.64	0.056	0.5	87	0.465	10.7	52	0.00032	0.013	1	2650	1025
67	12	227	56.83	0.147	0.5	149	0.517	10.7	67	0.00032	0.013	1	2650	1025
67	14	229	56.34	0.254	0.5	170	0.367	10.7	61	0.00032	0.013	1	2650	1025
67	16	231	55.64	0.186	0.5	193	0.412	10.7	59	0.00032	0.013	1	2650	1025
67	18	233	55.33	0.072	0.5	256	0.373	10.7	48	0.00032	0.013	1	2650	1025
67	20	235	55.77	0.074	0.5	346	0.212	10.7	53	0.00032	0.013	1	2650	1025
67	22	237	56.59	0.065	0.5	65	0.217	10.7	54	0.00032	0.013	1	2650	1025
68	0	239	56.94	0.160	0.5	164	0.236	10.7	48	0.00032	0.013	1	2650	1025
68	2	241	56.53	0.204	0.5	183	0.225	10.7	45	0.00032	0.013	1	2650	1025
68	4	243	55.79	0.195	0.5	201	0.193	10.7	43	0.00032	0.013	1	2650	1025
68	6	245	55.35	0.118	0.5	250	0.149	9.1	27	0.00032	0.013	1	2650	1025
68	8	247	55.61	0.167	0.5	325	0.155	12.8	25	0.00032	0.013	1	2650	1025
68	10	249	56.42	0.146	0.5	1	0.151	12.8	36	0.00032	0.013	1	2650	1025
68	12	251	56.92	0.050	0.5	96	0.132	9.1	348	0.00032	0.013	1	2650	1025
68	14	253	56.65	0.097	0.5	175	0.111	12.8	3	0.00032	0.013	1	2650	1025
68	16	255	55.93	0.143	0.5	208	0.118	12.8	36	0.00032	0.013	1	2650	1025
68	18	257	55.39	0.108	0.5	252	0.111	10.7	4	0.00032	0.013	1	2650	1025
68	20	259	55.53	0.187	0.5	350	0.102	12.8	5	0.00032	0.013	1	2650	1025
68	22	261	56.33	0.092	0.5	8	0.095	12.8	340	0.00032	0.013	1	2650	1025
69	0	263	56.98	0.048	0.5	169	0.110	12.8	331	0.00032	0.013	1	2650	1025

Day	Hour	time	h	u50	z	Cdir	Hs	Tp	Wdir	D	Hr	F	Rs	Rf
69	2	265	56.85	0.089	0.5	196	0.092	10.7	234	0.00032	0.013	1	2650	1025
69	4	267	56.15	0.070	0.5	214	0.106	10.7	332	0.00032	0.013	1	2650	1025
69	6	269	55.52	0.030	0.5	268	0.119	12.8	307	0.00032	0.013	1	2650	1025
69	8	271	55.42	0.107	0.5	341	0.171	12.8	329	0.00032	0.013	1	2650	1025
69	10	273	56.06	0.114	0.5	16	0.175	12.8	325	0.00032	0.013	1	2650	1025
69	12	275	56.78	0.040	0.5	153	0.165	10.7	6	0.00032	0.013	1	2650	1025
69	14	277	56.78	0.180	0.5	174	0.182	12.8	19	0.00032	0.013	1	2650	1025
69	16	279	56.19	0.111	0.5	187	0.256	10.7	39	0.00032	0.013	1	2650	1025
69	18	281	55.56	0.030	0.5	227	0.245	12.8	39	0.00032	0.013	1	2650	1025
69	20	283	55.39	0.046	0.5	286	0.270	12.8	43	0.00032	0.013	1	2650	1025
69	22	285	55.95	0.154	0.5	9	0.422	10.7	37	0.00032	0.013	1	2650	1025
70	0	287	56.78	0.023	0.5	114	0.308	10.7	40	0.00032	0.013	1	2650	1025
70	2	289	56.97	0.114	0.5	175	0.387	10.7	37	0.00032	0.013	1	2650	1025
70	4	291	56.44	0.100	0.5	195	0.319	10.7	41	0.00032	0.013	1	2650	1025
70	6	293	55.78	0.032	0.5	222	0.334	12.8	47	0.00032	0.013	1	2650	1025
70	8	295	55.42	0.013	0.5	263	0.235	10.7	36	0.00032	0.013	1	2650	1025
70	10	297	55.75	0.128	0.5	356	0.310	10.7	37	0.00032	0.013	1	2650	1025
70	12	299	56.52	0.036	0.5	20	0.318	10.7	39	0.00032	0.013	1	2650	1025
70	14	301	56.83	0.087	0.5	197	0.215	10.7	38	0.00032	0.013	1	2650	1025
70	16	303	56.47	0.128	0.5	201	0.204	10.7	29	0.00032	0.013	1	2650	1025
70	18	305	55.83	0.151	0.5	239	0.322	10.7	31	0.00032	0.013	1	2650	1025
70	20	307	55.49	0.151	0.5	270	0.369	9.1	22	0.00032	0.013	1	2650	1025
70	22	309	55.68	0.180	0.5	335	1.013	9.1	13	0.00032	0.013	1	2650	1025
71	0	311	56.42	0.094	0.5	341	1.496	10.7	2	0.00032	0.013	1	2650	1025
71	2	313	56.90	0.047	0.5	7	0.928	10.7	41	0.00032	0.013	1	2650	1025
71	4	315	56.62	0.017	0.5	131	0.833	12.8	53	0.00032	0.013	1	2650	1025
71	6	317	56.00	0.001	0.5	83	1.054	12.8	60	0.00032	0.013	1	2650	1025
71	8	319	55.51	0.043	0.5	65	0.774	12.8	51	0.00032	0.013	1	2650	1025
71	10	321	55.56	0.030	0.5	35	1.047	12.8	50	0.00032	0.013	1	2650	1025
71	12	323	56.15	0.020	0.5	87	0.787	10.7	41	0.00032	0.013	1	2650	1025
71	14	325	56.70	0.078	0.5	170	0.772	12.8	48	0.00032	0.013	1	2650	1025
71	16	327	56.58	0.058	0.5	196	0.934	12.8	39	0.00032	0.013	1	2650	1025
71	18	329	56.03	0.048	0.5	201	1.049	12.8	42	0.00032	0.013	1	2650	1025
71	20	331	55.57	0.026	0.5	224	0.798	12.8	42	0.00032	0.013	1	2650	1025
71	22	333	55.58	0.111	0.5	344	0.819	10.7	42	0.00032	0.013	1	2650	1025
72	0	335	56.13	0.081	0.5	360	0.574	12.8	46	0.00032	0.013	1	2650	1025
72	2	337	56.75	0.063	0.5	36	0.465	10.7	44	0.00032	0.013	1	2650	1025
72	4	339	56.79	0.112	0.5	152	0.576	12.8	56	0.00032	0.013	1	2650	1025
72	6	341	56.31	0.038	0.5	148	0.356	10.7	53	0.00032	0.013	1	2650	1025
72	8	343	55.81	0.032	0.5	138	0.540	10.7	49	0.00032	0.013	1	2650	1025
72	10	345	55.63	0.056	0.5	137	0.498	10.7	51	0.00032	0.013	1	2650	1025
72	12	347	55.94	0.025	0.5	69	0.456	10.7	59	0.00032	0.013	1	2650	1025
72	14	349	56.50	0.078	0.5	148	0.336	10.7	63	0.00032	0.013	1	2650	1025
72	16	351	56.64	0.104	0.5	169	0.275	10.7	59	0.00032	0.013	1	2650	1025

Day	Hour	time	h	u50	z	Cdir	Hs	Tp	Wdir	D	Hr	F	Rs	Rf
72	18	353	56.29	0.054	0.5	185	0.252	10.7	62	0.00032	0.013	1	2650	1025
72	20	355	55.86	0.043	0.5	209	0.216	10.7	41	0.00032	0.013	1	2650	1025
72	22	357	55.67	0.054	0.5	240	0.208	9.1	36	0.00032	0.013	1	2650	1025
73	0	359	55.92	0.112	0.5	11	0.161	10.7	35	0.00032	0.013	1	2650	1025
73	2	361	56.59	0.092	0.5	37	0.160	10.7	41	0.00032	0.013	1	2650	1025
73	4	363	56.77	0.102	0.5	148	0.463	9.1	23	0.00032	0.013	1	2650	1025
73	6	365	56.56	0.056	0.5	174	1.233	10.7	14	0.00032	0.013	1	2650	1025
73	8	367	56.13	0.033	0.5	186	1.605	12.8	338	0.00032	0.013	1	2650	1025
73	10	369	55.72	0.025	0.5	134	2.273	12.8	345	0.00032	0.013	1	2650	1025
73	12	371	55.70	0.037	0.5	340	2.804	12.8	354	0.00032	0.013	1	2650	1025
73	14	373	56.20	0.055	0.5	54	2.120	12.8	5	0.00032	0.013	1	2650	1025
73	16	375	56.36	0.061	0.5	110	5.137	12.8	4	0.00032	0.013	1	2650	1025
73	18	377	56.29	0.071	0.5	132	4.453	16.0	20	0.00032	0.013	1	2650	1025
73	20	379	55.96	0.041	0.5	137	3.130	16.0	12	0.00032	0.013	1	2650	1025
73	22	381	55.67	0.028	0.5	144	4.854	16.0	25	0.00032	0.013	1	2650	1025
74	0	383	55.77	0.008	0.5	38	4.021	16.0	26	0.00032	0.013	1	2650	1025
74	2	385	56.12	0.015	0.5	235	5.590	16.0	28	0.00032	0.013	1	2650	1025
74	4	387	56.57	0.057	0.5	147	6.522	16.0	39	0.00032	0.013	1	2650	1025
74	6	389	56.65	0.096	0.5	144	6.052	16.0	58	0.00032	0.013	1	2650	1025
74	8	391	56.39	0.126	0.5	161	4.774	16.0	53	0.00032	0.013	1	2650	1025
74	10	393	56.05	0.113	0.5	187	3.810	16.0	72	0.00032	0.013	1	2650	1025
74	12	395	55.88	0.046	0.5	233	4.070	16.0	57	0.00032	0.013	1	2650	1025
74	14	397	56.15	0.046	0.5	284	2.756	16.0	49	0.00032	0.013	1	2650	1025
74	16	399	56.53	0.038	0.5	241	2.584	12.8	50	0.00032	0.013	1	2650	1025
74	18	401	56.61	0.056	0.5	220	2.591	16.0	47	0.00032	0.013	1	2650	1025
74	20	403	56.44	0.108	0.5	199	1.965	16.0	50	0.00032	0.013	1	2650	1025
74	22	405	56.16	0.074	0.5	222	2.013	12.8	50	0.00032	0.013	1	2650	1025
75	0	407	56.03	0.059	0.5	249	1.753	16.0	54	0.00032	0.013	1	2650	1025
75	2	409	56.24	0.052	0.5	285	1.392	12.8	51	0.00032	0.013	1	2650	1025
75	4	411	56.63	0.027	0.5	281	1.079	12.8	45	0.00032	0.013	1	2650	1025
75	6	413	56.81	0.024	0.5	258	1.136	12.8	49	0.00032	0.013	1	2650	1025
75	8	415	56.71	0.067	0.5	225	0.880	12.8	57	0.00032	0.013	1	2650	1025
75	10	417	56.41	0.072	0.5	235	0.846	12.8	47	0.00032	0.013	1	2650	1025
75	12	419	56.13	0.053	0.5	271	0.812	12.8	52	0.00032	0.013	1	2650	1025
75	14	421	56.12	0.060	0.5	307	0.561	12.8	52	0.00032	0.013	1	2650	1025
75	16	423	56.44	0.023	0.5	278	0.680	12.8	48	0.00032	0.013	1	2650	1025
75	18	425	56.66	0.027	0.5	234	0.654	12.8	50	0.00032	0.013	1	2650	1025
75	20	427	56.63	0.047	0.5	213	0.467	12.8	51	0.00032	0.013	1	2650	1025
75	22	429	56.42	0.061	0.5	210	0.458	12.8	46	0.00032	0.013	1	2650	1025
76	0	431	56.16	0.037	0.5	249	0.500	10.7	47	0.00032	0.013	1	2650	1025
76	2	433	56.12	0.068	0.5	340	0.331	12.8	45	0.00032	0.013	1	2650	1025
76	4	435	56.44	0.025	0.5	316	0.266	12.8	42	0.00032	0.013	1	2650	1025
76	6	437	56.74	0.026	0.5	238	0.215	12.8	40	0.00032	0.013	1	2650	1025
76	8	439	56.77	0.027	0.5	213	0.228	12.8	26	0.00032	0.013	1	2650	1025

Day	Hour	time	h	u50	z	Cdir	Hs	Tp	Wdir	D	Hr	F	Rs	Rf
76	10	441	56.58	0.029	0.5	198	0.174	12.8	8	0.00032	0.013	1	2650	1025
76	12	443	56.26	0.017	0.5	240	0.193	12.8	35	0.00032	0.013	1	2650	1025
76	14	445	56.07	0.018	0.5	279	0.159	12.8	36	0.00032	0.013	1	2650	1025
76	16	447	56.22	0.076	0.5	354	0.210	9.1	31	0.00032	0.013	1	2650	1025
76	18	449	56.53	0.028	0.5	191	0.193	10.7	25	0.00032	0.013	1	2650	1025
76	20	451	56.68	0.045	0.5	172	0.194	9.1	51	0.00032	0.013	1	2650	1025
76	22	453	56.56	0.021	0.5	211	0.220	9.1	61	0.00032	0.013	1	2650	1025
77	0	455	56.27	0.015	0.5	228	0.253	9.1	46	0.00032	0.013	1	2650	1025
77	2	457	56.07	0.018	0.5	277	0.318	9.1	48	0.00032	0.013	1	2650	1025
77	4	459	56.17	0.079	0.5	343	0.237	9.1	38	0.00032	0.013	1	2650	1025
77	6	461	56.54	0.053	0.5	348	0.211	9.1	30	0.00032	0.013	1	2650	1025
77	8	463	56.79	0.023	0.5	218	0.250	9.1	46	0.00032	0.013	1	2650	1025
77	10	465	56.74	0.027	0.5	219	0.254	9.1	43	0.00032	0.013	1	2650	1025
77	12	467	56.43	0.019	0.5	254	0.352	9.1	23	0.00032	0.013	1	2650	1025
77	14	469	56.11	0.059	0.5	342	0.437	10.7	23	0.00032	0.013	1	2650	1025
77	16	471	56.09	0.044	0.5	339	0.674	10.7	15	0.00032	0.013	1	2650	1025
77	18	473	56.38	0.034	0.5	17	0.809	10.7	16	0.00032	0.013	1	2650	1025
77	20	475	56.67	0.042	0.5	166	1.025	10.7	4	0.00032	0.013	1	2650	1025
77	22	477	56.66	0.038	0.5	178	0.951	10.7	8	0.00032	0.013	1	2650	1025
78	0	479	56.38	0.022	0.5	232	1.111	10.7	351	0.00032	0.013	1	2650	1025
78	2	481	56.07	0.027	0.5	258	1.062	12.8	344	0.00032	0.013	1	2650	1025
78	4	483	56.01	0.046	0.5	298	1.282	12.8	326	0.00032	0.013	1	2650	1025
78	6	485	56.36	0.040	0.5	306	1.039	12.8	7	0.00032	0.013	1	2650	1025
78	8	487	56.74	0.026	0.5	267	1.284	12.8	7	0.00032	0.013	1	2650	1025
78	10	489	56.86	0.027	0.5	254	0.869	12.8	14	0.00032	0.013	1	2650	1025
78	12	491	56.58	0.034	0.5	245	0.918	12.8	8	0.00032	0.013	1	2650	1025
78	14	493	56.17	0.049	0.5	255	0.883	12.8	5	0.00032	0.013	1	2650	1025
78	16	495	55.99	0.089	0.5	318	0.759	12.8	357	0.00032	0.013	1	2650	1025
78	18	497	56.21	0.078	0.5	295	0.592	12.8	353	0.00032	0.013	1	2650	1025
78	20	499	56.60	0.061	0.5	245	0.564	12.8	348	0.00032	0.013	1	2650	1025
78	22	501	56.76	0.057	0.5	257	0.363	10.7	351	0.00032	0.013	1	2650	1025
79	0	503	56.56	0.053	0.5	247	0.438	10.7	349	0.00032	0.013	1	2650	1025
79	2	505	56.18	0.099	0.5	253	0.283	10.7	327	0.00032	0.013	1	2650	1025
79	4	507	55.99	0.125	0.5	288	0.344	10.7	345	0.00032	0.013	1	2650	1025
79	6	509	56.21	0.142	0.5	308	0.332	10.7	351	0.00032	0.013	1	2650	1025
79	8	511	56.65	0.095	0.5	285	0.190	10.7	338	0.00032	0.013	1	2650	1025
79	10	513	56.90	0.072	0.5	251	0.231	10.7	339	0.00032	0.013	1	2650	1025
79	12	515	56.72	0.137	0.5	226	0.195	10.7	309	0.00032	0.013	1	2650	1025
79	14	517	56.26	0.094	0.5	253	0.203	12.8	324	0.00032	0.013	1	2650	1025
79	16	519	55.96	0.105	0.5	271	0.166	12.8	336	0.00032	0.013	1	2650	1025
79	18	521	56.07	0.108	0.5	309	0.169	10.7	325	0.00032	0.013	1	2650	1025
79	20	523	56.54	0.018	0.5	248	0.147	10.7	321	0.00032	0.013	1	2650	1025
79	22	525	56.86	0.042	0.5	197	0.172	12.8	326	0.00032	0.013	1	2650	1025
80	0	527	56.76	0.123	0.5	216	0.168	12.8	321	0.00032	0.013	1	2650	1025

Day	Hour	time	h	u50	z	Cdir	Hs	Tp	Wdir	D	Hr	F	Rs	Rf
80	2	529	56.34	0.124	0.5	229	0.191	12.8	325	0.00032	0.013	1	2650	1025
80	4	531	55.99	0.104	0.5	252	0.176	10.7	320	0.00032	0.013	1	2650	1025
80	6	533	56.05	0.101	0.5	301	0.203	12.8	338	0.00032	0.013	1	2650	1025
80	8	535	56.51	0.073	0.5	319	0.190	12.8	315	0.00032	0.013	1	2650	1025
80	10	537	56.89	0.040	0.5	234	0.179	10.7	330	0.00032	0.013	1	2650	1025
80	12	539	56.83	0.068	0.5	211	0.172	12.8	318	0.00032	0.013	1	2650	1025
80	14	541	56.41	0.088	0.5	231	0.189	10.7	314	0.00032	0.013	1	2650	1025
80	16	543	55.99	0.077	0.5	279	0.155	12.8	321	0.00032	0.013	1	2650	1025
80	18	545	55.99	0.112	0.5	290	0.214	10.7	320	0.00032	0.013	1	2650	1025
80	20	547	56.41	0.095	0.5	321	0.217	10.7	317	0.00032	0.013	1	2650	1025
80	22	549	56.85	0.037	0.5	250	0.211	10.7	329	0.00032	0.013	1	2650	1025
81	0	551	56.87	0.075	0.5	218	0.292	10.7	317	0.00032	0.013	1	2650	1025
81	2	553	56.47	0.094	0.5	230	0.240	10.7	323	0.00032	0.013	1	2650	1025
81	4	555	56.01	0.115	0.5	242	0.201	10.7	334	0.00032	0.013	1	2650	1025
81	6	557	55.93	0.058	0.5	267	0.281	10.7	339	0.00032	0.013	1	2650	1025
81	8	559	56.31	0.106	0.5	312	0.152	10.7	329	0.00032	0.013	1	2650	1025
81	10	561	56.79	0.031	0.5	309	0.245	10.7	329	0.00032	0.013	1	2650	1025
81	12	563	56.89	0.059	0.5	218	0.159	10.7	328	0.00032	0.013	1	2650	1025
81	14	565	56.50	0.098	0.5	221	0.181	10.7	328	0.00032	0.013	1	2650	1025
81	16	567	56.04	0.092	0.5	270	0.184	10.7	331	0.00032	0.013	1	2650	1025
81	18	569	55.90	0.099	0.5	321	0.172	10.7	339	0.00032	0.013	1	2650	1025
81	20	571	56.24	0.143	0.5	341	0.200	12.8	330	0.00032	0.013	1	2650	1025
81	22	573	56.77	0.076	0.5	335	0.193	10.7	331	0.00032	0.013	1	2650	1025
82	0	575	56.97	0.048	0.5	206	0.160	10.7	320	0.00032	0.013	1	2650	1025
82	2	577	56.62	0.104	0.5	206	0.160	10.7	321	0.00032	0.013	1	2650	1025
82	4	579	56.09	0.020	0.5	227	0.160	10.7	331	0.00032	0.013	1	2650	1025
82	6	581	55.87	0.019	0.5	251	0.180	10.7	304	0.00032	0.013	1	2650	1025
82	8	583	56.15	0.099	0.5	354	0.196	12.8	316	0.00032	0.013	1	2650	1025
82	10	585	56.68	0.053	0.5	32	0.178	10.7	329	0.00032	0.013	1	2650	1025
82	12	587	56.92	0.054	0.5	155	0.153	10.7	316	0.00032	0.013	1	2650	1025
82	14	589	56.66	0.078	0.5	177	0.157	12.8	320	0.00032	0.013	1	2650	1025
82	16	591	56.15	0.020	0.5	181	0.157	12.8	313	0.00032	0.013	1	2650	1025
82	18	593	55.91	0.015	0.5	222	0.140	10.7	315	0.00032	0.013	1	2650	1025
82	20	595	56.13	0.100	0.5	345	0.128	10.7	312	0.00032	0.013	1	2650	1025
82	22	597	56.70	0.024	0.5	39	0.130	12.8	323	0.00032	0.013	1	2650	1025
83	0	599	57.02	0.061	0.5	182	0.159	12.8	324	0.00032	0.013	1	2650	1025
83	2	601	56.78	0.111	0.5	215	0.147	12.8	305	0.00032	0.013	1	2650	1025
83	4	603	56.26	0.102	0.5	243	0.125	16.0	315	0.00032	0.013	1	2650	1025
83	6	605	55.91	0.098	0.5	299	0.129	10.7	300	0.00032	0.013	1	2650	1025
83	8	607	56.03	0.140	0.5	322	0.146	16.0	331	0.00032	0.013	1	2650	1025
83	10	609	56.56	0.080	0.5	329	0.157	12.8	312	0.00032	0.013	1	2650	1025
83	12	611	56.94	0.043	0.5	250	0.159	16.0	309	0.00032	0.013	1	2650	1025
83	14	613	56.78	0.095	0.5	220	0.102	10.7	315	0.00032	0.013	1	2650	1025
83	16	615	56.29	0.106	0.5	235	0.163	12.8	316	0.00032	0.013	1	2650	1025

Day	Hour	time	h	u50	z	Cdir	Hs	Tp	Wdir	D	Hr	F	Rs	Rf
83	18	617	55.95	0.151	0.5	284	0.130	12.8	312	0.00032	0.013	1	2650	1025
83	20	619	56.06	0.171	0.5	312	0.114	10.7	302	0.00032	0.013	1	2650	1025
83	22	621	56.57	0.106	0.5	321	0.163	12.8	322	0.00032	0.013	1	2650	1025
84	0	623	56.99	0.075	0.5	322	0.115	12.8	319	0.00032	0.013	1	2650	1025
84	2	625	56.93	0.052	0.5	219	0.133	12.8	319	0.00032	0.013	1	2650	1025
84	4	627	56.41	0.069	0.5	217	0.104	12.8	315	0.00032	0.013	1	2650	1025
84	6	629	55.97	0.054	0.5	269	0.139	12.8	339	0.00032	0.013	1	2650	1025
84	8	631	55.95	0.068	0.5	317	0.099	12.8	322	0.00032	0.013	1	2650	1025
84	10	633	56.39	0.087	0.5	352	0.114	10.7	319	0.00032	0.013	1	2650	1025
84	12	635	56.87	0.009	0.5	83	0.114	12.8	329	0.00032	0.013	1	2650	1025
84	14	637	56.86	0.117	0.5	188	0.119	12.8	331	0.00032	0.013	1	2650	1025
84	16	639	56.39	0.092	0.5	202	0.102	12.8	326	0.00032	0.013	1	2650	1025
84	18	641	55.98	0.080	0.5	230	0.104	12.8	326	0.00032	0.013	1	2650	1025
84	20	643	55.96	0.063	0.5	295	0.087	10.7	333	0.00032	0.013	1	2650	1025
84	22	645	56.40	0.065	0.5	359	0.103	12.8	328	0.00032	0.013	1	2650	1025

Appendix 3

The results of Site 2 video image analyses. The listed parameters are burst number (bt#), day, hour, tape counter number (Ctr#), and bed classification. See text for bed type definitions.

BT	Day	Time	Ctr#	bed	Notes
1	55	2	0	Wc-r	totally dark
2	55	3	19	Wc-r	becoming light, see bar
3	55	4	39	Wc-r	
4	55	5	58	Wc-r	
5	55	6	77	Wc-r	
6	55	7	96	Wc-r	
7	55	8	111	Wc-r	
8	55	9	130	Wc-r	becoming dark
9	55	10	149	Wc-r	
10	55	11	167	Wc-r	
11	55	12	184	Wc-r	barely see bars
12	55	13	202	Wc-r	totally dark
13	55	14	219	Wc-r	
14	55	15	235	Wc-r	
15	55	16	253	Wc-r	
16	55	17	270	Wc-r	
17	55	18	288	Wc-r	
18	55	19	305	Wc-r	
19	55	20	323	Wc-r	
20	55	21	340	Wc-r	
21	55	22	357	Wc-r	
22	55	23	373	Wc-r	
23	56	0	390	Wc-r	
24	56	1	407	Wc-r	
25	56	2	424	Wc-r	
26	56	3	441	Wc-r	
27	56	4	458	Wc-r	becoming light
28	56	5	474	Wc-r	
29	56	6	489	Wc-r	
30	56	7	504	Wc-r	bars slightly shaking
31	56	8	520	Wc-r	becoming dark
32	56	9	537	Wc-r	
33	56	10	553	Wc-r	
34	56	11	569	Wc-r	
35	56	12	583	Wc-r	barely see bars
36	56	13	600	Wc-r	totally dark
37	56	14	615	Wc-r	
38	56	15	634	Wc-r	
39	56	16	647	Wc-r	bars slightly shaking
40	56	17	663	Wc-r	
41	56	18	677	Wc-r	
42	56	19	693	Wc-r	

BT	Day	Time	Ctr#	bed	Notes
43	56	20	709	Wc-r	
44	56	21	724	Wc-r	
45	56	22	737	Wc-r	
46	56	23	752	Wc-r	
47	57	0	767	Wc-r	
48	57	1	781	Wc-r	
49	57	2	796	Wc-r	
50	57	3	810	Wc-r	
51	57	4	825	Wc-r	becoming light
52	57	5	841	Wc-r	
53	57	6	856	Wc-r	
54	57	7	871	Wc-r	
55	57	8	886	Wc-r	
56	57	9	900	Wc-r	bars shaking
57	57	10	915	Wc-r	becoming dark
58	57	11	928	Wc-r	
59	57	12	944	Wc-r	barely see bars
60	57	13	959	Wc-r	totally dark
61	57	14	972	Wc-r	
62	57	15	987	Wc-r	
63	57	16	1001	Wc-r	
64	57	17	1016	Wc-r	
65	57	18	1029	Wc-r	
66	57	19	1044	Wc-r	
67	57	20	1057	Wc-r	
68	57	21	1071	Wc-r	
69	57	22	1086	Wc-r	
70	57	23	1100	Wc-r	
71	58	0	1114	Wc-r	
72	58	1	1129	Wc-r	
73	58	2	1143	Wc-r	
74	58	3	1156	Wc-r	
75	58	4	1170	Wc-r	
76	58	5	1184	Wc-r	becoming light
77	58	6	1198	Wc-r	
78	58	7	1211	Wc-r	
79	58	8	1224	W	bedload; becoming dark
80	58	9	1238	W	bedload; ripples migrated
81	58	10	1251	W	bedload; ripples migrated
82	58	11	1265	W	bedload; ripples migrated; barely see bars
83	58	12	1278	W	bedload; totally dark
84	58	13	1291	W	bedload; ripples migrated

BT	Day	Time	Ctr#	bed	Notes
85	58	14	1304	W/SS	strong suspension; water murky
86	58	15	1320	W/SS	suspension; transitory wave ripples
87	58	16	1333	W/SS	weak suspension
88	58	17	1345	UPB	sheet flow and strong suspension
89	58	18	1360	UPB	sheet flow; transitory ripples at reverses
90	58	19	1373	W/SS	suspension; possible large wave ripples
91	58	20	1386	UPB	sheet flow; transitory ripples at reverses
92	58	21	1397	W/SS	suspension; transitory wave ripples

Appendix 4

Site 2 output data of GSC continental shelf sediment transport model SEDTRANS92: (A) bottom boundary layer parameters and (B) sediment transport rates and directions. The boundary layer parameters are time (hours), near-bed wave orbital velocity (u_b, m/s), near-bed wave orbital amplitude (A_b, m), combined wave-current friction factor (f_{cw}), skin friction current shear velocity (u_{*cs}, cm/s), skin friction wave shear velocity (u_{*ws}, cm/s), skin friction combined wave-current shear velocity (u_{*cws}, cm/s), total current shear velocity (u_{*c}, cm/s), total wave shear velocity (u_{*w}, cm/s), total combined wave-current shear velocity (u_{*cw}, cm/s), thickness of the wave-current boundary layer (d_{cw}, cm), inner-layer bottom roughness (z_o, cm), apparent bottom roughness (z_{oc}, cm). The sediment transport parameters include time (hour), mass sediment transport rates and directions predicted by Engelund-Hansen method (q_{EH}, D-EH), Einstein-Brown method (q_{EB}, D-EB), Bagnold method (q_{BGN}, D-BG), and Yalin method (q_{YL}, D-YL). All sediment transport rates are in kg m^{-1} s^{-1}.

time	ub	Ab	fcws	u*cs	u*ws	u*cw$	u*c	u*w	u*cw	dcw	z0	z0c
1	0.012	0.020	0.0277	0.07	0.15	0.17	0.12	0.51	0.52	0.71	0.158	0.503
3	0.010	0.016	0.0182	0.39	0.19	0.41	0.70	0.51	0.79	1.08	0.158	0.195
5	0.005	0.008	0.0197	0.38	0.14	0.40	0.68	0.39	0.78	0.91	0.158	0.199
7	0.011	0.019	0.0190	0.33	0.20	0.37	0.60	0.54	0.76	1.04	0.158	0.236
9	0.009	0.015	0.0181	0.40	0.19	0.41	0.72	0.49	0.79	1.08	0.158	0.189
11	0.010	0.017	0.0187	0.35	0.19	0.39	0.63	0.52	0.78	1.07	0.158	0.228
13	0.007	0.012	0.0370	0.03	0.10	0.10	0.04	0.35	0.35	0.48	0.158	0.426
15	0.012	0.025	0.0162	0.40	0.22	0.45	0.72	0.58	0.91	1.49	0.158	0.253
17	0.007	0.012	0.0165	0.49	0.18	0.51	0.88	0.46	0.96	1.31	0.158	0.190
19	0.008	0.014	0.0174	0.43	0.19	0.45	0.78	0.49	0.87	1.19	0.158	0.194
21	0.010	0.016	0.0177	0.39	0.20	0.43	0.70	0.53	0.87	1.19	0.158	0.236
23	0.007	0.012	0.0170	0.44	0.18	0.48	0.80	0.46	0.92	1.25	0.158	0.206
25	0.009	0.015	0.0225	0.21	0.15	0.26	0.38	0.45	0.58	0.79	0.158	0.278
27	0.008	0.014	0.0196	0.31	0.17	0.35	0.56	0.47	0.71	0.97	0.158	0.230
29	0.014	0.028	0.0160	0.40	0.24	0.46	0.73	0.62	0.95	1.54	0.158	0.268
31	0.017	0.034	0.0158	0.46	0.27	0.48	0.84	0.68	0.94	1.53	0.158	0.202
33	0.024	0.049	0.0162	0.39	0.31	0.45	0.73	0.83	0.99	1.61	0.158	0.289
35	0.018	0.030	0.0167	0.41	0.28	0.50	0.75	0.75	1.06	1.44	0.158	0.303
37	0.022	0.038	0.0194	0.22	0.28	0.35	0.39	0.81	0.90	1.22	0.158	0.502
39	0.026	0.038	0.0202	0.23	0.32	0.38	0.41	0.94	1.01	1.17	0.158	0.516
41	0.031	0.045	0.0150	0.62	0.45	0.76	1.13	1.17	1.61	1.87	0.158	0.328
43	0.085	0.144	0.0114	1.00	0.93	1.34	1.65	1.89	2.47	3.37	0.084	0.287
45	0.116	0.197	0.0103	1.31	1.22	1.79	2.44	2.87	3.77	5.13	0.170	0.562
47	0.263	0.535	0.0087	1.39	2.08	2.50	2.33	4.05	4.66	7.60	0.088	0.820
49	0.284	0.578	0.0086	1.47	2.22	2.65	2.50	4.38	5.02	8.18	0.095	0.894
51	0.357	0.727	0.0088	0.46	2.40	2.45	0.72	4.71	4.77	7.77	0.082	3.908
53	0.434	1.106	0.0079	0.35	2.75	2.77	0.56	5.48	5.51	11.23	0.103	6.964
55	0.399	1.017	0.0081	0.35	2.56	2.58	0.55	4.98	5.01	10.21	0.090	6.053
57	0.254	0.518	0.0097	0.26	1.79	1.81	0.43	4.09	4.11	6.69	0.137	4.460
59	0.278	0.565	0.0095	0.23	1.92	1.93	0.36	4.16	4.17	6.80	0.112	4.753
61	0.277	0.563	0.0095	0.27	1.91	1.92	0.43	4.16	4.17	6.79	0.115	4.438
63	0.195	0.396	0.0104	0.34	1.43	1.45	0.59	3.62	3.64	5.93	0.184	3.366
65	0.148	0.301	0.0107	0.63	1.20	1.34	1.13	2.87	3.05	4.98	0.150	1.363
67	0.142	0.288	0.0111	0.41	1.13	1.20	0.73	2.35	2.87	4.68	0.158	1.983
69	0.098	0.199	0.0126	0.32	0.81	0.85	0.57	1.71	2.16	3.52	0.158	1.542
71	0.129	0.263	0.0118	0.36	1.00	1.02	0.64	2.12	2.58	4.21	0.158	1.855
73	0.058	0.099	0.0143	0.43	0.60	0.73	0.77	1.59	1.76	2.40	0.158	0.726
75	0.059	0.100	0.0162	0.08	0.53	0.54	0.13	1.53	1.54	2.09	0.158	1.696
77	0.073	0.149	0.0138	0.20	0.64	0.67	0.33	1.72	1.75	2.85	0.158	1.646
79	0.053	0.091	0.0162	0.19	0.51	0.54	0.31	1.45	1.48	2.01	0.158	1.175
81	0.060	0.122	0.0150	0.14	0.53	0.54	0.23	1.48	1.49	2.43	0.158	1.585
83	0.056	0.115	0.0155	0.06	0.50	0.50	0.08	1.42	1.42	2.31	0.158	1.970
85	0.053	0.107	0.0149	0.34	0.50	0.55	0.64	1.37	1.42	2.32	0.158	0.694
87	0.054	0.110	0.0143	0.35	0.53	0.61	0.64	1.41	1.51	2.46	0.158	0.767

time	ub	Ab	fcws	u*cs	u*ws	u*cws	u*c	u*w	u*cw	dcw	z0	z0c
89	0.054	0.110	0.0142	0.33	0.53	0.62	0.59	1.42	1.52	2.48	0.158	0.848
91	0.055	0.113	0.0144	0.31	0.53	0.60	0.55	1.43	1.51	2.45	0.158	0.902
93	0.046	0.095	0.0160	0.17	0.44	0.46	0.30	1.24	1.27	2.06	0.158	1.121
95	0.064	0.131	0.0147	0.17	0.56	0.57	0.29	1.56	1.57	2.55	0.158	1.528
97	0.065	0.132	0.0147	0.13	0.56	0.57	0.22	1.56	1.57	2.56	0.158	1.735
99	0.074	0.151	0.0136	0.23	0.65	0.69	0.40	1.74	1.78	2.90	0.158	1.509
101	0.077	0.157	0.0139	0.13	0.65	0.66	0.20	1.77	1.77	2.89	0.158	2.068
103	0.050	0.102	0.0159	0.16	0.46	0.47	0.27	1.3	1.32	2.15	0.158	1.255
105	0.089	0.180	0.0131	0.19	0.74	0.77	0.32	1.96	1.99	3.24	0.158	1.984
107	0.105	0.214	0.0126	0.14	0.84	0.85	0.22	1.78	2.22	3.61	0.158	2.633
109	0.075	0.154	0.0141	0.14	0.64	0.64	0.23	1.74	1.74	2.84	0.158	1.934
111	0.083	0.170	0.0135	0.16	0.69	0.70	0.26	1.87	1.88	3.06	0.158	2.038
113	0.095	0.193	0.0125	0.32	0.80	0.86	0.55	1.68	2.15	3.50	0.158	1.571
115	0.118	0.240	0.0120	0.29	0.94	0.97	0.49	1.98	2.44	3.98	0.158	2.069
117	0.081	0.166	0.0134	0.23	0.69	0.72	0.39	1.85	1.87	3.05	0.158	1.638
119	0.084	0.172	0.0136	0.21	0.70	0.70	0.36	1.88	1.89	3.07	0.158	1.736
121	0.078	0.160	0.0136	0.24	0.67	0.70	0.41	1.8	1.83	2.98	0.158	1.551
123	0.064	0.131	0.0132	0.48	0.63	0.76	0.89	1.62	1.78	2.91	0.158	0.676
125	0.051	0.103	0.0159	0.21	0.46	0.47	0.37	1.31	1.32	2.15	0.158	1.029
127	0.061	0.125	0.0136	0.44	0.59	0.70	0.82	1.55	1.68	2.74	0.158	0.684
129	0.038	0.078	0.0153	0.30	0.42	0.51	0.54	1.13	1.25	2.03	0.158	0.667
131	0.025	0.043	0.0214	0.13	0.27	0.29	0.23	0.85	0.86	1.17	0.158	0.690
133	0.025	0.043	0.0218	0.13	0.27	0.28	0.22	0.85	0.86	1.17	0.158	0.690
135	0.026	0.045	0.0172	0.38	0.34	0.46	0.71	0.93	1.07	1.45	0.158	0.331
137	0.025	0.043	0.0205	0.14	0.28	0.31	0.23	0.86	0.89	1.21	0.158	0.714
139	0.018	0.031	0.0194	0.26	0.25	0.35	0.48	0.72	0.84	1.15	0.158	0.373
141	0.023	0.039	0.0191	0.27	0.29	0.37	0.50	0.83	0.92	1.25	0.158	0.408
143	0.016	0.027	0.0205	0.25	0.22	0.31	0.47	0.65	0.75	1.02	0.158	0.317
145	0.017	0.030	0.0213	0.24	0.23	0.29	0.45	0.67	0.73	0.99	0.158	0.321
147	0.017	0.029	0.0162	0.45	0.28	0.53	0.82	0.75	1.11	1.51	0.158	0.282
149	0.017	0.029	0.0253	0.06	0.20	0.20	0.10	0.65	0.66	0.89	0.158	0.690
151	0.015	0.026	0.0259	0.07	0.18	0.19	0.11	0.61	0.61	0.84	0.158	0.625
153	0.018	0.031	0.0208	0.19	0.24	0.30	0.33	0.7	0.78	1.06	0.158	0.469
155	0.016	0.028	0.0195	0.27	0.24	0.35	0.49	0.68	0.81	1.11	0.158	0.339
157	0.016	0.028	0.0235	0.15	0.20	0.23	0.27	0.64	0.67	0.91	0.158	0.449
159	0.016	0.028	0.0183	0.32	0.25	0.40	0.57	0.7	0.90	1.23	0.158	0.335
161	0.016	0.027	0.0219	0.20	0.21	0.27	0.35	0.64	0.70	0.96	0.158	0.387
163	0.015	0.026	0.0197	0.29	0.23	0.34	0.53	0.64	0.77	1.05	0.158	0.288
165	0.011	0.015	0.0197	0.37	0.21	0.40	0.67	0.56	0.82	0.95	0.158	0.217
167	0.011	0.016	0.0172	0.54	0.23	0.55	0.98	0.61	1.03	1.19	0.158	0.175
169	0.016	0.024	0.0161	0.61	0.31	0.64	1.11	0.78	1.22	1.42	0.158	0.193
171	0.048	0.082	0.0117	1.06	0.67	1.24	1.93	1.36	2.47	3.37	0.158	0.309
173	0.052	0.089	0.0117	1.04	0.71	1.25	1.90	1.43	2.52	3.44	0.158	0.337
175	0.066	0.112	0.0119	0.95	0.77	1.18	1.76	1.58	2.46	3.34	0.158	0.376

time	ub	Ab	fcws	u*cs	u*ws	u*cw	u*c	u*w	u*cw	dcw	z0	z0c
177	0.090	0.153	0.0140	0.16	0.76	0.78	0.26	2.08	2.09	2.85	0.158	1.980
179	0.123	0.210	0.0126	0.29	0.99	1.01	0.50	2.14	2.62	3.57	0.158	1.973
181	0.214	0.436	0.0099	0.62	1.60	1.71	1.13	3.83	3.98	6.49	0.166	2.291
183	0.251	0.510	0.0092	0.89	1.88	2.08	1.50	3.89	4.17	6.80	0.103	1.506
185	0.239	0.487	0.0091	1.17	1.88	2.19	1.98	3.78	4.23	6.89	0.096	0.926
187	0.179	0.364	0.0100	0.90	1.45	1.66	1.71	3.54	3.86	6.29	0.187	1.318
189	0.221	0.449	0.0100	0.44	1.59	1.62	0.79	3.98	4.01	6.54	0.186	3.258
191	0.173	0.352	0.0108	0.30	1.28	1.30	0.49	3.05	3.06	4.99	0.135	2.790
193	0.170	0.347	0.0109	0.27	1.27	1.28	0.45	2.67	3.15	5.13	0.158	3.134
195	0.162	0.330	0.0111	0.08	1.21	1.21	0.12	2.56	3.02	4.93	0.158	4.320
197	0.155	0.316	0.0112	0.21	1.17	1.18	0.35	2.47	2.95	4.80	0.158	3.183
199	0.087	0.176	0.0129	0.43	0.74	0.79	0.79	1.94	2.00	3.25	0.158	0.975
201	0.102	0.208	0.0121	0.40	0.87	0.96	0.70	1.81	2.31	3.77	0.158	1.437
203	0.082	0.139	0.0131	0.49	0.78	0.92	0.89	1.64	2.19	2.99	0.158	0.908
205	0.104	0.212	0.0120	0.41	0.89	0.98	0.73	1.84	2.35	3.83	0.158	1.418
207	0.127	0.259	0.0117	0.34	1.01	1.04	0.59	2.11	2.59	4.23	0.158	2.012
209	0.099	0.201	0.0122	0.38	0.84	0.92	0.67	1.75	2.25	3.66	0.158	1.433
211	0.077	0.132	0.0130	0.54	0.76	0.93	0.98	1.59	2.17	2.96	0.158	0.792
213	0.045	0.077	0.0161	0.41	0.47	0.55	0.77	1.31	1.38	1.88	0.158	0.468
215	0.057	0.097	0.0142	0.64	0.60	0.75	1.21	1.56	1.70	2.32	0.158	0.345
217	0.062	0.105	0.0150	0.48	0.59	0.65	0.92	1.61	1.66	2.26	0.158	0.515
219	0.050	0.086	0.0117	1.09	0.69	1.24	1.99	1.39	2.45	3.34	0.158	0.280
221	0.041	0.070	0.0157	0.37	0.46	0.58	0.66	1.25	1.41	1.92	0.158	0.592
223	0.042	0.072	0.0154	0.44	0.47	0.60	0.81	1.27	1.43	1.95	0.158	0.466
225	0.036	0.061	0.0170	0.28	0.40	0.48	0.51	1.12	1.21	1.65	0.158	0.617
227	0.039	0.067	0.0147	0.61	0.48	0.68	1.13	1.24	1.46	1.99	0.158	0.277
229	0.029	0.049	0.0124	1.01	0.49	1.06	1.84	0.97	2.00	2.73	0.158	0.199
231	0.033	0.056	0.0132	0.78	0.49	0.89	1.43	0.98	1.79	2.44	0.158	0.274
233	0.030	0.051	0.0168	0.34	0.37	0.49	0.62	1.01	1.17	1.60	0.158	0.473
235	0.017	0.029	0.0191	0.31	0.24	0.37	0.57	0.69	0.82	1.12	0.158	0.284
237	0.017	0.028	0.0188	0.29	0.25	0.38	0.52	0.7	0.87	1.18	0.158	0.352
239	0.018	0.031	0.0147	0.64	0.32	0.69	1.17	0.81	1.33	1.81	0.158	0.211
241	0.017	0.030	0.0133	0.82	0.35	0.88	1.49	0.7	1.68	2.28	0.158	0.212
243	0.015	0.026	0.0135	0.79	0.33	0.85	1.43	0.65	1.63	2.22	0.158	0.217
245	0.007	0.010	0.0180	0.47	0.18	0.50	0.85	0.47	0.94	1.09	0.158	0.192
247	0.018	0.036	0.0134	0.67	0.32	0.72	1.22	0.79	1.37	2.23	0.158	0.211
249	0.017	0.035	0.0138	0.60	0.31	0.67	1.09	0.76	1.30	2.13	0.158	0.240
251	0.006	0.008	0.0266	0.20	0.12	0.22	0.36	0.34	0.45	0.52	0.158	0.199
253	0.012	0.025	0.0159	0.41	0.23	0.47	0.74	0.59	0.95	1.54	0.158	0.259
255	0.014	0.027	0.0140	0.59	0.27	0.65	1.07	0.67	1.26	2.05	0.158	0.233
257	0.009	0.015	0.0175	0.43	0.19	0.45	0.77	0.51	0.86	1.17	0.158	0.192
259	0.012	0.024	0.0129	0.75	0.27	0.80	1.36	0.66	1.51	2.46	0.158	0.206
261	0.011	0.022	0.0165	0.38	0.20	0.43	0.69	0.54	0.86	1.40	0.158	0.244
263	0.012	0.025	0.0199	0.21	0.19	0.28	0.38	0.53	0.65	1.06	0.158	0.344

time	ub	Ab	fcws	u*cs	u*ws	u*cw	u*c	u*w	u*cw	dcw	z0	z0c
265	0.007	0.012	0.0186	0.36	0.16	0.39	0.65	0.44	0.76	1.04	0.158	0.209
267	0.008	0.014	0.0206	0.28	0.16	0.31	0.52	0.45	0.63	0.86	0.158	0.217
269	0.014	0.028	0.0222	0.14	0.18	0.22	0.25	0.54	0.59	0.96	0.158	0.444
271	0.020	0.040	0.0149	0.46	0.31	0.55	0.84	0.79	1.15	1.87	0.158	0.306
273	0.020	0.041	0.0150	0.48	0.31	0.54	0.87	0.79	1.12	1.82	0.158	0.267
275	0.013	0.021	0.0227	0.18	0.18	0.25	0.32	0.55	0.63	0.86	0.158	0.360
277	0.020	0.041	0.0127	0.75	0.37	0.82	1.35	0.88	1.60	2.61	0.158	0.242
279	0.020	0.034	0.0159	0.47	0.32	0.56	0.86	0.83	1.17	1.60	0.158	0.291
281	0.028	0.057	0.0181	0.16	0.30	0.34	0.28	0.89	0.93	1.52	0.158	0.761
283	0.031	0.064	0.0174	0.23	0.33	0.38	0.42	0.95	1.00	1.63	0.158	0.611
285	0.033	0.057	0.0138	0.67	0.47	0.81	1.22	1.18	1.68	2.28	0.158	0.325
287	0.024	0.040	0.0220	0.13	0.26	0.27	0.22	0.81	0.82	1.12	0.158	0.671
289	0.029	0.050	0.0153	0.50	0.40	0.62	0.92	1.04	1.34	1.83	0.158	0.345
291	0.025	0.042	0.0160	0.44	0.35	0.56	0.81	0.93	1.21	1.65	0.158	0.348
293	0.038	0.078	0.0165	0.19	0.39	0.43	0.32	1.09	1.14	1.86	0.158	0.925
295	0.019	0.032	0.0241	0.07	0.21	0.22	0.12	0.7	0.70	0.96	0.158	0.705
297	0.025	0.042	0.0151	0.55	0.37	0.64	1.00	0.95	1.33	1.82	0.158	0.292
299	0.025	0.042	0.0198	0.19	0.29	0.34	0.32	0.85	0.91	1.24	0.158	0.595
301	0.016	0.028	0.0174	0.38	0.26	0.46	0.68	0.71	0.98	1.33	0.158	0.301
303	0.016	0.027	0.0154	0.53	0.29	0.61	0.97	0.74	1.22	1.66	0.158	0.257
305	0.025	0.043	0.0142	0.64	0.40	0.75	1.17	1.01	1.52	2.07	0.158	0.285
307	0.016	0.024	0.0161	0.61	0.31	0.64	1.10	0.79	1.25	1.44	0.158	0.205
309	0.045	0.065	0.0137	0.79	0.60	0.96	1.44	1.23	2.02	2.34	0.158	0.342
311	0.116	0.197	0.0120	0.55	1.02	1.15	1.00	2.14	2.74	3.73	0.158	1.174
313	0.071	0.120	0.0145	0.29	0.65	0.70	0.50	1.77	1.83	2.49	0.158	1.171
315	0.094	0.191	0.0131	0.14	0.76	0.76	0.22	2.03	2.03	3.31	0.158	2.372
317	0.120	0.245	0.0122	0.01	0.94	0.94	0.02	1.99	2.43	3.96	0.158	3.871
319	0.089	0.182	0.0128	0.29	0.76	0.81	0.50	1.99	2.05	3.33	0.158	1.581
321	0.120	0.245	0.0119	0.23	0.96	0.98	0.39	2.01	2.48	4.04	0.158	2.414
323	0.061	0.105	0.0158	0.14	0.56	0.57	0.23	1.59	1.60	2.18	0.158	1.498
325	0.087	0.176	0.0127	0.44	0.76	0.84	0.80	1.96	2.05	3.34	0.158	1.014
327	0.105	0.214	0.0121	0.38	0.88	0.95	0.67	1.84	2.33	3.80	0.158	1.533
329	0.119	0.243	0.0118	0.34	0.97	1.02	0.59	2.02	2.51	4.10	0.158	1.911
331	0.092	0.187	0.0130	0.20	0.76	0.79	0.33	2.01	2.04	3.32	0.158	2.031
333	0.065	0.111	0.0138	0.54	0.66	0.80	1.00	1.72	1.89	2.58	0.158	0.591
335	0.065	0.133	0.0134	0.43	0.62	0.73	0.78	1.62	1.75	2.86	0.158	0.790
337	0.036	0.061	0.0165	0.31	0.41	0.51	0.56	1.13	1.26	1.72	0.158	0.590
339	0.065	0.131	0.0136	0.52	0.61	0.69	0.98	1.59	1.67	2.73	0.158	0.516
341	0.028	0.047	0.0206	0.19	0.30	0.31	0.34	0.91	0.92	1.25	0.158	0.578
343	0.043	0.073	0.0181	0.18	0.41	0.41	0.32	1.23	1.23	1.67	0.158	0.902
345	0.040	0.067	0.0180	0.27	0.40	0.42	0.50	1.17	1.19	1.61	0.158	0.601
347	0.036	0.061	0.0184	0.15	0.37	0.40	0.25	1.1	1.12	1.53	0.158	0.929
349	0.026	0.044	0.0185	0.33	0.31	0.39	0.62	0.89	0.96	1.31	0.158	0.332
351	0.021	0.036	0.0169	0.43	0.31	0.48	0.79	0.82	1.03	1.41	0.158	0.263

time	ub	Ab	fcws	u*cs	u*ws	u*cw	u*c	u*w	u*cw	dcw	z0	z0c
353	0.020	0.033	0.0200	0.25	0.25	0.33	0.45	0.74	0.83	1.13	0.158	0.389
355	0.017	0.029	0.0207	0.20	0.23	0.31	0.36	0.68	0.77	1.05	0.158	0.429
357	0.009	0.013	0.0233	0.23	0.17	0.28	0.41	0.49	0.63	0.73	0.158	0.269
359	0.013	0.022	0.0164	0.46	0.24	0.52	0.84	0.64	1.04	1.42	0.158	0.243
361	0.012	0.021	0.0175	0.39	0.23	0.45	0.70	0.61	0.93	1.26	0.158	0.263
363	0.019	0.028	0.0179	0.43	0.30	0.50	0.78	0.82	1.07	1.24	0.158	0.274
365	0.095	0.162	0.0132	0.35	0.83	0.90	0.62	1.77	2.27	3.09	0.158	1.372
367	0.182	0.371	0.0106	0.29	1.35	1.38	0.48	3.35	3.38	5.51	0.166	3.338
369	0.261	0.531	0.0096	0.26	1.82	1.84	0.41	4.11	4.12	6.72	0.130	4.521
371	0.322	0.655	0.0090	0.38	2.19	2.23	0.58	4.35	4.39	7.16	0.083	3.953
373	0.240	0.490	0.0098	0.46	1.72	1.76	0.79	4.02	4.07	6.63	0.149	3.165
375	0.581	1.183	0.0078	0.67	3.63	3.65	1.22	8.05	8.07	13.16	0.169	6.807
377	0.653	1.662	0.0071	0.80	3.92	3.95	1.55	8.65	8.70	17.72	0.193	7.927
379	0.461	1.174	0.0078	0.47	2.90	2.92	0.80	5.87	5.90	12.03	0.114	6.404
381	0.719	1.830	0.0070	0.42	4.25	4.26	0.83	9.56	9.58	19.51	0.218	13.216
383	0.594	1.513	0.0073	0.14	3.59	3.60	0.24	7.74	7.74	15.76	0.165	13.652
385	0.821	2.092	0.0067	0.28	4.78	4.78	0.58	11.06	11.07	22.55	0.263	17.843
387	0.951	2.422	0.0065	0.81	5.44	5.46	1.82	13	13.04	26.57	0.325	14.383
389	0.882	2.245	0.0066	1.10	5.08	5.10	2.39	11.95	11.98	24.40	0.291	10.087
391	0.698	1.778	0.0070	1.20	4.18	4.24	2.41	9.38	9.49	19.33	0.217	6.179
393	0.560	1.427	0.0073	1.03	3.46	3.53	1.92	7.4	7.51	15.29	0.159	4.757
395	0.600	1.529	0.0072	0.57	3.66	3.70	1.06	7.92	7.99	16.28	0.173	8.919
397	0.405	1.031	0.0080	0.49	2.59	2.62	0.79	5.08	5.11	10.42	0.093	5.009
399	0.291	0.592	0.0093	0.37	2.02	2.05	0.59	4.18	4.23	6.89	0.098	3.783
401	0.378	0.962	0.0081	0.56	2.47	2.53	0.90	4.77	4.85	9.88	0.087	4.107
403	0.287	0.731	0.0085	0.80	2.00	2.14	1.35	4.01	4.21	8.57	0.097	2.036
405	0.229	0.466	0.0097	0.56	1.68	1.77	1.00	3.91	4.03	6.57	0.150	2.585
407	0.258	0.657	0.0089	0.50	1.79	1.86	0.87	3.94	4.03	8.22	0.136	3.384
409	0.158	0.321	0.0110	0.38	1.21	1.24	0.67	2.53	3.03	4.94	0.158	2.298
411	0.121	0.247	0.0120	0.22	0.95	0.97	0.37	2.01	2.47	4.02	0.158	2.489
413	0.127	0.259	0.0118	0.20	0.99	1.01	0.33	2.1	2.56	4.17	0.158	2.719
415	0.099	0.201	0.0121	0.42	0.85	0.95	0.74	1.77	2.28	3.71	0.158	1.328
417	0.096	0.195	0.0121	0.43	0.84	0.94	0.78	1.73	2.25	3.67	0.158	1.240
419	0.092	0.188	0.0127	0.34	0.79	0.84	0.59	2.04	2.10	3.43	0.158	1.439
421	0.064	0.130	0.0143	0.33	0.57	0.61	0.60	1.56	1.59	2.60	0.158	0.910
423	0.077	0.156	0.0138	0.17	0.65	0.67	0.28	1.77	1.78	2.90	0.158	1.838
425	0.073	0.150	0.0138	0.19	0.64	0.66	0.32	1.72	1.75	2.84	0.158	1.688
427	0.052	0.107	0.0147	0.27	0.51	0.57	0.48	1.37	1.45	2.37	0.158	0.965
429	0.052	0.105	0.0143	0.33	0.52	0.61	0.60	1.38	1.49	2.44	0.158	0.817
431	0.039	0.066	0.0174	0.21	0.41	0.45	0.36	1.17	1.22	1.67	0.158	0.826
433	0.038	0.077	0.0159	0.32	0.40	0.47	0.60	1.1	1.18	1.92	0.158	0.537
435	0.030	0.061	0.0191	0.14	0.30	0.31	0.25	0.91	0.91	1.49	0.158	0.811
437	0.024	0.049	0.0193	0.14	0.27	0.30	0.24	0.79	0.83	1.35	0.158	0.716
439	0.026	0.052	0.0188	0.15	0.28	0.32	0.26	0.83	0.87	1.41	0.158	0.738

time	ub	Ab	fcws	u*cs	u*ws	u*cw	u*c	u*w	u*cw	dcw	z0	z0c
441	0.020	0.040	0.0200	0.15	0.23	0.28	0.26	0.69	0.74	1.21	0.158	0.589
443	0.022	0.045	0.0207	0.10	0.24	0.26	0.16	0.74	0.75	1.22	0.158	0.792
445	0.018	0.037	0.0225	0.10	0.20	0.22	0.16	0.64	0.65	1.07	0.158	0.660
447	0.009	0.013	0.0209	0.31	0.18	0.36	0.57	0.51	0.74	0.86	0.158	0.235
449	0.015	0.025	0.0233	0.14	0.20	0.24	0.24	0.61	0.65	0.89	0.158	0.468
451	0.008	0.012	0.0262	0.19	0.14	0.22	0.34	0.43	0.52	0.60	0.158	0.250
453	0.009	0.013	0.0304	0.10	0.14	0.17	0.17	0.46	0.48	0.56	0.158	0.358
455	0.011	0.016	0.0304	0.08	0.15	0.17	0.12	0.5	0.52	0.60	0.158	0.435
457	0.014	0.020	0.0281	0.09	0.18	0.20	0.16	0.59	0.60	0.70	0.158	0.476
459	0.010	0.015	0.0207	0.33	0.19	0.36	0.59	0.54	0.75	0.87	0.158	0.229
461	0.009	0.013	0.0238	0.23	0.16	0.27	0.41	0.48	0.60	0.70	0.158	0.258
463	0.010	0.015	0.0284	0.11	0.15	0.19	0.19	0.5	0.53	0.62	0.158	0.376
465	0.011	0.015	0.0274	0.13	0.16	0.20	0.22	0.51	0.55	0.64	0.158	0.364
467	0.015	0.022	0.0273	0.10	0.19	0.21	0.16	0.63	0.64	0.74	0.158	0.500
469	0.034	0.058	0.0172	0.29	0.38	0.47	0.52	1.09	1.18	1.61	0.158	0.574
471	0.053	0.090	0.0159	0.25	0.52	0.57	0.44	1.44	1.50	2.04	0.158	0.955
473	0.063	0.107	0.0153	0.22	0.58	0.62	0.37	1.62	1.66	2.26	0.158	1.257
475	0.079	0.134	0.0141	0.27	0.71	0.75	0.47	1.91	1.96	2.67	0.158	1.362
477	0.073	0.124	0.0145	0.24	0.66	0.70	0.42	1.81	1.85	2.53	0.158	1.352
479	0.086	0.146	0.0142	0.17	0.73	0.74	0.27	2.01	2.02	2.76	0.158	1.876
481	0.121	0.246	0.0121	0.22	0.94	0.95	0.36	2	2.44	3.98	0.158	2.461
483	0.146	0.297	0.0112	0.34	1.14	1.18	0.60	2.38	2.88	4.70	0.158	2.324
485	0.117	0.239	0.0121	0.29	0.93	0.96	0.50	1.97	2.43	3.95	0.158	2.039
487	0.144	0.293	0.0115	0.22	1.09	1.10	0.36	2.31	2.78	4.52	0.158	2.925
489	0.097	0.198	0.0129	0.20	0.79	0.81	0.34	2.09	2.10	3.43	0.158	2.075
491	0.103	0.210	0.0126	0.25	0.84	0.86	0.42	1.77	2.21	3.60	0.158	1.981
493	0.100	0.204	0.0126	0.32	0.82	0.84	0.56	1.73	2.17	3.54	0.158	1.579
495	0.087	0.176	0.0123	0.49	0.78	0.90	0.90	1.62	2.14	3.49	0.158	0.952
497	0.067	0.137	0.0135	0.41	0.62	0.71	0.76	1.64	1.74	2.84	0.158	0.809
499	0.063	0.129	0.0144	0.33	0.57	0.60	0.60	1.55	1.58	2.58	0.158	0.889
501	0.028	0.047	0.0196	0.26	0.31	0.34	0.48	0.92	0.94	1.28	0.158	0.442
503	0.034	0.057	0.0185	0.26	0.36	0.40	0.47	1.05	1.09	1.48	0.158	0.558
505	0.022	0.038	0.0172	0.41	0.31	0.47	0.76	0.84	1.01	1.38	0.158	0.270
507	0.027	0.046	0.0153	0.53	0.38	0.62	0.97	0.99	1.30	1.78	0.158	0.291
509	0.026	0.044	0.0146	0.60	0.39	0.70	1.10	1	1.43	1.95	0.158	0.282
511	0.015	0.025	0.0175	0.40	0.25	0.45	0.72	0.66	0.93	1.26	0.158	0.251
513	0.018	0.030	0.0202	0.29	0.24	0.32	0.55	0.69	0.75	1.03	0.158	0.264
515	0.015	0.025	0.0159	0.54	0.27	0.56	0.98	0.7	1.06	1.45	0.158	0.187
517	0.023	0.047	0.0161	0.39	0.31	0.45	0.73	0.81	0.99	1.61	0.158	0.291
519	0.019	0.039	0.0157	0.43	0.29	0.48	0.79	0.74	1.00	1.63	0.158	0.255
521	0.013	0.023	0.0165	0.45	0.25	0.51	0.82	0.65	1.04	1.42	0.158	0.252
523	0.011	0.019	0.0288	0.09	0.15	0.16	0.15	0.49	0.50	0.68	0.158	0.433
525	0.019	0.039	0.0195	0.20	0.24	0.29	0.36	0.69	0.75	1.23	0.158	0.462
527	0.019	0.038	0.0151	0.50	0.29	0.53	0.90	0.75	1.05	1.71	0.158	0.219

time	ub	Ab	fcws	u*cs	u*ws	u*cw	u*c	u*w	u*cw	dcw	z0	z0c
529	0.022	0.044	0.0152	0.50	0.32	0.53	0.91	0.8	1.05	1.72	0.158	0.217
531	0.014	0.024	0.0174	0.42	0.24	0.46	0.77	0.64	0.91	1.25	0.158	0.219
533	0.023	0.047	0.0151	0.44	0.33	0.53	0.80	0.85	1.14	1.85	0.158	0.327
535	0.021	0.044	0.0163	0.33	0.29	0.44	0.60	0.79	0.99	1.61	0.158	0.392
537	0.014	0.023	0.0245	0.17	0.18	0.22	0.32	0.56	0.59	0.80	0.158	0.330
539	0.019	0.039	0.0182	0.29	0.25	0.34	0.53	0.7	0.80	1.30	0.158	0.315
541	0.015	0.025	0.0189	0.35	0.23	0.38	0.65	0.63	0.79	1.07	0.158	0.219
543	0.018	0.036	0.0169	0.33	0.26	0.41	0.61	0.69	0.89	1.45	0.158	0.320
545	0.017	0.029	0.0161	0.47	0.29	0.55	0.86	0.75	1.12	1.53	0.158	0.268
547	0.017	0.029	0.0168	0.41	0.28	0.49	0.74	0.74	1.05	1.42	0.158	0.298
549	0.016	0.027	0.0237	0.17	0.20	0.23	0.31	0.63	0.65	0.89	0.158	0.395
551	0.022	0.038	0.0189	0.32	0.28	0.37	0.59	0.81	0.89	1.21	0.158	0.312
553	0.019	0.032	0.0183	0.38	0.27	0.40	0.70	0.73	0.86	1.17	0.158	0.231
555	0.016	0.027	0.0172	0.45	0.26	0.47	0.83	0.69	0.92	1.25	0.158	0.195
557	0.022	0.038	0.0198	0.26	0.27	0.34	0.48	0.8	0.86	1.17	0.158	0.385
559	0.012	0.020	0.0168	0.44	0.23	0.50	0.80	0.61	1.00	1.36	0.158	0.243
561	0.019	0.032	0.0217	0.16	0.23	0.28	0.27	0.71	0.76	1.03	0.158	0.527
563	0.012	0.021	0.0215	0.25	0.19	0.28	0.45	0.55	0.64	0.88	0.158	0.263
565	0.014	0.024	0.0179	0.39	0.24	0.42	0.72	0.63	0.86	1.17	0.158	0.219
567	0.014	0.025	0.0179	0.38	0.24	0.42	0.69	0.65	0.88	1.20	0.158	0.243
569	0.014	0.023	0.0170	0.42	0.24	0.48	0.75	0.65	0.99	1.35	0.158	0.263
571	0.023	0.046	0.0135	0.61	0.36	0.71	1.11	0.9	1.42	2.32	0.158	0.286
573	0.015	0.025	0.0182	0.33	0.24	0.41	0.60	0.66	0.89	1.21	0.158	0.308
575	0.012	0.021	0.0228	0.20	0.18	0.25	0.37	0.54	0.61	0.83	0.158	0.299
577	0.012	0.021	0.0175	0.42	0.23	0.45	0.76	0.6	0.89	1.22	0.158	0.214
579	0.013	0.021	0.0277	0.10	0.16	0.17	0.17	0.53	0.53	0.73	0.158	0.448
581	0.014	0.024	0.0258	0.10	0.18	0.19	0.17	0.58	0.59	0.80	0.158	0.507
583	0.022	0.045	0.0152	0.43	0.32	0.52	0.79	0.83	1.11	1.81	0.158	0.322
585	0.014	0.023	0.0216	0.23	0.20	0.28	0.42	0.59	0.67	0.91	0.158	0.306
587	0.012	0.020	0.0209	0.24	0.19	0.30	0.43	0.54	0.69	0.94	0.158	0.311
589	0.018	0.036	0.0167	0.34	0.26	0.42	0.62	0.7	0.91	1.48	0.158	0.322
591	0.018	0.036	0.0221	0.10	0.20	0.22	0.18	0.64	0.66	1.07	0.158	0.635
593	0.011	0.019	0.0303	0.08	0.14	0.14	0.13	0.48	0.48	0.66	0.158	0.449
595	0.010	0.017	0.0174	0.41	0.20	0.45	0.74	0.54	0.90	1.23	0.158	0.227
597	0.015	0.030	0.0239	0.11	0.17	0.19	0.20	0.56	0.57	0.93	0.158	0.489
599	0.018	0.036	0.0179	0.27	0.24	0.36	0.50	0.68	0.82	1.34	0.158	0.364
601	0.016	0.033	0.0161	0.44	0.26	0.45	0.80	0.67	0.89	1.45	0.158	0.195
603	0.018	0.047	0.0147	0.42	0.27	0.45	0.76	0.68	0.92	1.87	0.158	0.241
605	0.010	0.017	0.0174	0.41	0.21	0.46	0.74	0.55	0.92	1.25	0.158	0.238
607	0.022	0.055	0.0126	0.59	0.34	0.68	1.08	0.82	1.36	2.76	0.158	0.283
609	0.018	0.036	0.0164	0.35	0.26	0.44	0.64	0.7	0.95	1.55	0.158	0.330
611	0.023	0.059	0.0173	0.21	0.26	0.31	0.38	0.73	0.78	1.60	0.158	0.526
613	0.008	0.013	0.0189	0.37	0.17	0.38	0.67	0.45	0.71	0.97	0.158	0.175
615	0.018	0.038	0.0161	0.43	0.27	0.46	0.79	0.72	0.93	1.51	0.158	0.224

time	ub	Ab	fcws	u*cs	u*ws	u*cws	u*c	u*w	u*cw	dcw	z0	z0c
617	0.015	0.030	0.0137	0.62	0.29	0.68	1.12	0.71	1.31	2.14	0.158	0.229
619	0.009	0.015	0.0144	0.69	0.23	0.72	1.24	0.58	1.36	1.86	0.158	0.198
621	0.018	0.037	0.0150	0.46	0.29	0.54	0.83	0.75	1.12	1.82	0.158	0.298
623	0.013	0.026	0.0173	0.32	0.21	0.39	0.58	0.58	0.82	1.33	0.158	0.292
625	0.015	0.030	0.0206	0.22	0.20	0.26	0.41	0.58	0.63	1.02	0.158	0.303
627	0.012	0.024	0.0193	0.28	0.19	0.30	0.51	0.51	0.63	1.03	0.158	0.224
629	0.016	0.032	0.0197	0.23	0.21	0.28	0.43	0.61	0.68	1.11	0.158	0.327
631	0.011	0.023	0.0180	0.29	0.19	0.35	0.52	0.53	0.74	1.21	0.158	0.288
633	0.009	0.015	0.0185	0.36	0.18	0.40	0.65	0.49	0.80	1.09	0.158	0.227
635	0.013	0.026	0.0265	0.05	0.15	0.15	0.08	0.5	0.51	0.82	0.158	0.627
637	0.013	0.027	0.0151	0.48	0.25	0.53	0.87	0.63	1.05	1.71	0.158	0.236
639	0.012	0.024	0.0168	0.37	0.21	0.41	0.68	0.55	0.82	1.34	0.158	0.229
641	0.012	0.024	0.0183	0.32	0.20	0.34	0.58	0.53	0.68	1.11	0.158	0.207
643	0.007	0.012	0.0212	0.26	0.14	0.29	0.47	0.4	0.60	0.82	0.158	0.227
645	0.012	0.024	0.0184	0.28	0.19	0.33	0.50	0.53	0.72	1.17	0.158	0.286

time	qEH	DirE	qEB	DirEB	qBG	DirB	qYL	DirYL
1	0.000000	0	0.000000	0	0.000000	0	0.000000	0
3	0.000000	0	0.000000	0	0.000000	0	0.000000	0
5	0.000000	0	0.000000	0	0.000000	0	0.000000	0
7	0.000000	0	0.000000	0	0.000000	0	0.000000	0
9	0.000000	0	0.000000	0	0.000000	0	0.000000	0
11	0.000000	0	0.000000	0	0.000000	0	0.000000	0
13	0.000000	0	0.000000	0	0.000000	0	0.000000	0
15	0.000000	0	0.000000	0	0.000000	0	0.000000	0
17	0.000000	0	0.000000	0	0.000000	0	0.000000	0
19	0.000000	0	0.000000	0	0.000000	0	0.000000	0
21	0.000000	0	0.000000	0	0.000000	0	0.000000	0
23	0.000000	0	0.000000	0	0.000000	0	0.000000	0
25	0.000000	0	0.000000	0	0.000000	0	0.000000	0
27	0.000000	0	0.000000	0	0.000000	0	0.000000	0
29	0.000000	0	0.000000	0	0.000000	0	0.000000	0
31	0.000000	0	0.000000	0	0.000000	0	0.000000	0
33	0.000000	0	0.000000	0	0.000000	0	0.000000	0
35	0.000000	0	0.000000	0	0.000000	0	0.000000	0
37	0.000000	0	0.000000	0	0.000000	0	0.000000	0
39	0.000000	0	0.000000	0	0.000000	0	0.000000	0
41	0.000000	0	0.000000	0	0.000000	0	0.000000	0
43	0.000306	302	0.000254	304	0.000263	288	0.000588	287
45	0.001504	300	0.001958	300	0.002202	297	0.004108	296
47	0.001951	304	0.005983	304	0.014577	308	0.010664	308
49	0.002524	320	0.008203	320	0.028928	325	0.013835	326
51	0.000029	324	0.001313	325	0.000436	323	0.002791	322
53	0.000012	181	0.001844	180	0.000558	181	0.003602	181
55	0.000009	173	0.001073	173	0.000290	176	0.002286	179
57	0.000003	188	0.000167	187	0.000030	189	0.000299	189
59	0.000002	197	0.000168	197	0.000030	194	0.000346	193
61	0.000001	23	0.000054	22	0.000027	29	0.000124	45
63	0.000003	210	0.000039	210	0.000017	201	0.000021	200
65	0.000032	203	0.000074	203	0.000055	192	0.000074	192
67	0.000006	199	0.000028	198	0.000019	201	0.000006	201
69	0.000000	0	0.000000	0	0.000000	0	0.000000	0
71	0.000000	0	0.000000	0	0.000000	0	0.000000	0
73	0.000000	0	0.000000	0	0.000000	0	0.000000	0
75	0.000000	0	0.000000	0	0.000000	0	0.000000	0
77	0.000000	0	0.000000	0	0.000000	0	0.000000	0
79	0.000000	0	0.000000	0	0.000000	0	0.000000	0
81	0.000000	0	0.000000	0	0.000000	0	0.000000	0
83	0.000000	0	0.000000	0	0.000000	0	0.000000	0
85	0.000000	0	0.000000	0	0.000000	0	0.000000	0
87	0.000000	0	0.000000	0	0.000000	0	0.000000	0

time	qEH	DirE	qEB	DirEB	qBG	DirB	qYL	DirYL
89	0.000000	0	0.000000	0	0.000000	0	0.000000	0
91	0.000000	0	0.000000	0	0.000000	0	0.000000	0
93	0.000000	0	0.000000	0	0.000000	0	0.000000	0
95	0.000000	0	0.000000	0	0.000000	0	0.000000	0
97	0.000000	0	0.000000	0	0.000000	0	0.000000	0
99	0.000000	0	0.000000	0	0.000000	0	0.000000	0
101	0.000000	0	0.000000	0	0.000000	0	0.000000	0
103	0.000000	0	0.000000	0	0.000000	0	0.000000	0
105	0.000000	0	0.000000	0	0.000000	0	0.000000	0
107	0.000000	0	0.000000	0	0.000000	0	0.000000	0
109	0.000000	0	0.000000	0	0.000000	0	0.000000	0
111	0.000000	0	0.000000	0	0.000000	0	0.000000	0
113	0.000000	0	0.000000	0	0.000000	0	0.000000	0
115	0.000000	0	0.000000	0	0.000000	0	0.000000	0
117	0.000000	0	0.000000	0	0.000000	0	0.000000	0
119	0.000000	0	0.000000	0	0.000000	0	0.000000	0
121	0.000000	0	0.000000	0	0.000000	0	0.000000	0
123	0.000000	0	0.000000	0	0.000000	0	0.000000	0
125	0.000000	0	0.000000	0	0.000000	0	0.000000	0
127	0.000000	0	0.000000	0	0.000000	0	0.000000	0
129	0.000000	0	0.000000	0	0.000000	0	0.000000	0
131	0.000000	0	0.000000	0	0.000000	0	0.000000	0
133	0.000000	0	0.000000	0	0.000000	0	0.000000	0
135	0.000000	0	0.000000	0	0.000000	0	0.000000	0
137	0.000000	0	0.000000	0	0.000000	0	0.000000	0
139	0.000000	0	0.000000	0	0.000000	0	0.000000	0
141	0.000000	0	0.000000	0	0.000000	0	0.000000	0
143	0.000000	0	0.000000	0	0.000000	0	0.000000	0
145	0.000000	0	0.000000	0	0.000000	0	0.000000	0
147	0.000000	0	0.000000	0	0.000000	0	0.000000	0
149	0.000000	0	0.000000	0	0.000000	0	0.000000	0
151	0.000000	0	0.000000	0	0.000000	0	0.000000	0
153	0.000000	0	0.000000	0	0.000000	0	0.000000	0
155	0.000000	0	0.000000	0	0.000000	0	0.000000	0
157	0.000000	0	0.000000	0	0.000000	0	0.000000	0
159	0.000000	0	0.000000	0	0.000000	0	0.000000	0
161	0.000000	0	0.000000	0	0.000000	0	0.000000	0
163	0.000000	0	0.000000	0	0.000000	0	0.000000	0
165	0.000000	0	0.000000	0	0.000000	0	0.000000	0
167	0.000000	0	0.000000	0	0.000000	0	0.000000	0
169	0.000000	0	0.000000	0	0.000000	0	0.000000	0
171	0.000427	315	0.000247	317	0.000263	300	0.000559	299
173	0.000433	306	0.000298	306	0.000264	317	0.000567	318
175	0.000162	312	0.000069	301	0.000147	327	0.000213	328

time	qEH	DirE	qEB	DirEB	qBG	DirB	qYL	DirYL
177	0.000000	0	0.000000	0	0.000000	0	0.000000	0
179	0.000000	0	0.000000	0	0.000000	0	0.000000	0
181	0.000054	298	0.000300	298	0.000136	292	0.000569	292
183	0.000268	302	0.001292	303	0.000882	301	0.002698	300
185	0.000758	298	0.002008	298	0.002570	308	0.004603	309
187	0.000179	306	0.000321	305	0.000284	320	0.000796	321
189	0.000007	299	0.000067	298	0.000035	310	0.000096	311
191	0.000001	127	0.000009	127	0.000009	137	0.000000	138
193	0.000000	0	0.000000	0	0.000000	0	0.000000	0
195	0.000000	0	0.000000	0	0.000000	0	0.000000	0
197	0.000000	0	0.000000	0	0.000000	0	0.000000	0
199	0.000000	0	0.000000	0	0.000000	0	0.000000	0
201	0.000000	0	0.000000	0	0.000000	0	0.000000	0
203	0.000000	0	0.000000	0	0.000000	0	0.000000	0
205	0.000000	0	0.000000	0	0.000000	0	0.000000	0
207	0.000000	0	0.000000	0	0.000000	0	0.000000	0
209	0.000000	0	0.000000	0	0.000000	0	0.000000	0
211	0.000000	0	0.000000	0	0.000000	0	0.000000	0
213	0.000000	0	0.000000	0	0.000000	0	0.000000	0
215	0.000000	0	0.000000	0	0.000000	0	0.000000	0
217	0.000000	0	0.000000	0	0.000000	0	0.000000	0
219	0.000301	207	0.000078	222	0.000241	204	0.000477	202
221	0.000000	0	0.000000	0	0.000000	0	0.000000	0
223	0.000000	0	0.000000	0	0.000000	0	0.000000	0
225	0.000000	0	0.000000	0	0.000000	0	0.000000	0
227	0.000000	0	0.000000	0	0.000000	0	0.000000	0
229	0.000349	181	0.000088	187	0.000109	185	0.000093	182
231	0.000032	224	0.000010	235	0.000047	206	0.000002	206
233	0.000000	0	0.000000	0	0.000000	0	0.000000	0
235	0.000000	0	0.000000	0	0.000000	0	0.000000	0
237	0.000000	0	0.000000	0	0.000000	0	0.000000	0
239	0.000000	0	0.000000	0	0.000000	0	0.000000	0
241	0.000044	209	0.000011	220	0.000051	192	0.000002	192
243	0.000043	221	0.000018	222	0.000046	205	0.000001	205
245	0.000000	0	0.000000	0	0.000000	0	0.000000	0
247	0.000000	0	0.000000	0	0.000000	0	0.000000	0
249	0.000000	0	0.000000	0	0.000000	0	0.000000	0
251	0.000000	0	0.000000	0	0.000000	0	0.000000	0
253	0.000000	0	0.000000	0	0.000000	0	0.000000	0
255	0.000000	0	0.000000	0	0.000000	0	0.000000	0
257	0.000000	0	0.000000	0	0.000000	0	0.000000	0
259	0.000000	0	0.000000	0	0.000000	0	0.000000	0
261	0.000000	0	0.000000	0	0.000000	0	0.000000	0
263	0.000000	0	0.000000	0	0.000000	0	0.000000	0

time	qEH	DirE	qEB	DirEB	qBG	DirB	qYL	DirYL
265	0.000000	0	0.000000	0	0.000000	0	0.000000	0
267	0.000000	0	0.000000	0	0.000000	0	0.000000	0
269	0.000000	0	0.000000	0	0.000000	0	0.000000	0
271	0.000000	0	0.000000	0	0.000000	0	0.000000	0
273	0.000000	0	0.000000	0	0.000000	0	0.000000	0
275	0.000000	0	0.000000	0	0.000000	0	0.000000	0
277	0.000000	0	0.000000	0	0.000000	0	0.000000	0
279	0.000000	0	0.000000	0	0.000000	0	0.000000	0
281	0.000000	0	0.000000	0	0.000000	0	0.000000	0
283	0.000000	0	0.000000	0	0.000000	0	0.000000	0
285	0.000000	0	0.000000	0	0.000000	0	0.000000	0
287	0.000000	0	0.000000	0	0.000000	0	0.000000	0
289	0.000000	0	0.000000	0	0.000000	0	0.000000	0
291	0.000000	0	0.000000	0	0.000000	0	0.000000	0
293	0.000000	0	0.000000	0	0.000000	0	0.000000	0
295	0.000000	0	0.000000	0	0.000000	0	0.000000	0
297	0.000000	0	0.000000	0	0.000000	0	0.000000	0
299	0.000000	0	0.000000	0	0.000000	0	0.000000	0
301	0.000000	0	0.000000	0	0.000000	0	0.000000	0
303	0.000000	0	0.000000	0	0.000000	0	0.000000	0
305	0.000000	0	0.000000	0	0.000000	0	0.000000	0
307	0.000000	0	0.000000	0	0.000000	0	0.000000	0
309	0.000060	6	0.000029	12	0.000060	348	0.000017	348
311	0.000016	1	0.000035	1	0.000032	354	0.000011	354
313	0.000000	0	0.000000	0	0.000000	0	0.000000	0
315	0.000000	0	0.000000	0	0.000000	0	0.000000	0
317	0.000000	0	0.000000	0	0.000000	0	0.000000	0
319	0.000000	0	0.000000	0	0.000000	0	0.000000	0
321	0.000000	0	0.000000	0	0.000000	0	0.000000	0
323	0.000000	0	0.000000	0	0.000000	0	0.000000	0
325	0.000000	0	0.000000	0	0.000000	0	0.000000	0
327	0.000000	0	0.000000	0	0.000000	0	0.000000	0
329	0.000000	0	0.000000	0	0.000000	0	0.000000	0
331	0.000000	0	0.000000	0	0.000000	0	0.000000	0
333	0.000000	0	0.000000	0	0.000000	0	0.000000	0
335	0.000000	0	0.000000	0	0.000000	0	0.000000	0
337	0.000000	0	0.000000	0	0.000000	0	0.000000	0
339	0.000000	0	0.000000	0	0.000000	0	0.000000	0
341	0.000000	0	0.000000	0	0.000000	0	0.000000	0
343	0.000000	0	0.000000	0	0.000000	0	0.000000	0
345	0.000000	0	0.000000	0	0.000000	0	0.000000	0
347	0.000000	0	0.000000	0	0.000000	0	0.000000	0
349	0.000000	0	0.000000	0	0.000000	0	0.000000	0
351	0.000000	0	0.000000	0	0.000000	0	0.000000	0

time	qEH	DirE	qEB	DirEB	qBG	DirB	qYL	DirYL
353	0.000000	0	0.000000	0	0.000000	0	0.000000	0
355	0.000000	0	0.000000	0	0.000000	0	0.000000	0
357	0.000000	0	0.000000	0	0.000000	0	0.000000	0
359	0.000000	0	0.000000	0	0.000000	0	0.000000	0
361	0.000000	0	0.000000	0	0.000000	0	0.000000	0
363	0.000000	0	0.000000	0	0.000000	0	0.000000	0
365	0.000000	0	0.000000	0	0.000000	0	0.000000	0
367	0.000002	158	0.000039	158	0.000013	162	0.000017	162
369	0.000002	164	0.000153	164	0.000030	161	0.000290	160
371	0.000013	353	0.000657	353	0.000159	351	0.001451	351
373	0.000014	5	0.000167	5	0.000063	14	0.000314	15
375	0.000048	180	0.003681	183	0.012676	174	0.006463	146
377	0.000127	197	0.008912	199	0.062323	190	0.012340	170
379	0.000021	191	0.001813	191	0.001059	185	0.003599	176
381	0.000019	204	0.009044	204	0.052277	200	0.009809	182
383	0.000001	26	0.002612	25	0.001222	26	0.003582	28
385	0.000009	208	0.019361	207	0.247355	209	0.015103	215
387	0.000151	216	0.037238	218	17.883086	211	0.027961	180
389	0.000110	79	0.008124	58	3.830455	69	0.022194	132
391	0.000529	225	0.015299	232	0.472789	219	0.021183	195
393	0.000335	247	0.007270	251	0.036194	238	0.012484	225
395	0.000094	236	0.012940	237	0.033794	236	0.016203	236
397	0.000021	229	0.001093	229	0.000508	236	0.002442	243
399	0.000011	230	0.000439	229	0.000102	231	0.000943	231
401	0.000055	226	0.001921	227	0.000836	225	0.003927	225
403	0.000168	229	0.001074	229	0.000675	221	0.002428	220
405	0.000044	229	0.000354	230	0.000133	228	0.000670	227
407	0.000030	234	0.000382	234	0.000120	237	0.000745	237
409	0.000003	231	0.000014	231	0.000014	243	0.000001	243
411	0.000000	0	0.000000	0	0.000000	0	0.000000	0
413	0.000000	0	0.000000	0	0.000000	0	0.000000	0
415	0.000000	0	0.000000	0	0.000000	0	0.000000	0
417	0.000000	0	0.000000	0	0.000000	0	0.000000	0
419	0.000000	0	0.000000	0	0.000000	0	0.000000	0
421	0.000000	0	0.000000	0	0.000000	0	0.000000	0
423	0.000000	0	0.000000	0	0.000000	0	0.000000	0
425	0.000000	0	0.000000	0	0.000000	0	0.000000	0
427	0.000000	0	0.000000	0	0.000000	0	0.000000	0
429	0.000000	0	0.000000	0	0.000000	0	0.000000	0
431	0.000000	0	0.000000	0	0.000000	0	0.000000	0
433	0.000000	0	0.000000	0	0.000000	0	0.000000	0
435	0.000000	0	0.000000	0	0.000000	0	0.000000	0
437	0.000000	0	0.000000	0	0.000000	0	0.000000	0
439	0.000000	0	0.000000	0	0.000000	0	0.000000	0

time	qEH	DirE	qEB	DirEB	qBG	DirB	qYL	DirYL
441	0.000000	0	0.000000	0	0.000000	0	0.000000	0
443	0.000000	0	0.000000	0	0.000000	0	0.000000	0
445	0.000000	0	0.000000	0	0.000000	0	0.000000	0
447	0.000000	0	0.000000	0	0.000000	0	0.000000	0
449	0.000000	0	0.000000	0	0.000000	0	0.000000	0
451	0.000000	0	0.000000	0	0.000000	0	0.000000	0
453	0.000000	0	0.000000	0	0.000000	0	0.000000	0
455	0.000000	0	0.000000	0	0.000000	0	0.000000	0
457	0.000000	0	0.000000	0	0.000000	0	0.000000	0
459	0.000000	0	0.000000	0	0.000000	0	0.000000	0
461	0.000000	0	0.000000	0	0.000000	0	0.000000	0
463	0.000000	0	0.000000	0	0.000000	0	0.000000	0
465	0.000000	0	0.000000	0	0.000000	0	0.000000	0
467	0.000000	0	0.000000	0	0.000000	0	0.000000	0
469	0.000000	0	0.000000	0	0.000000	0	0.000000	0
471	0.000000	0	0.000000	0	0.000000	0	0.000000	0
473	0.000000	0	0.000000	0	0.000000	0	0.000000	0
475	0.000000	0	0.000000	0	0.000000	0	0.000000	0
477	0.000000	0	0.000000	0	0.000000	0	0.000000	0
479	0.000000	0	0.000000	0	0.000000	0	0.000000	0
481	0.000000	0	0.000000	0	0.000000	0	0.000000	0
483	0.000002	325	0.000014	325	0.000012	319	0.000001	319
485	0.000000	0	0.000000	0	0.000000	0	0.000000	0
487	0.000000	0	0.000000	0	0.000000	0	0.000000	0
489	0.000000	0	0.000000	0	0.000000	0	0.000000	0
491	0.000000	0	0.000000	0	0.000000	0	0.000000	0
493	0.000000	0	0.000000	0	0.000000	0	0.000000	0
495	0.000000	0	0.000000	0	0.000000	0	0.000000	0
497	0.000000	0	0.000000	0	0.000000	0	0.000000	0
499	0.000000	0	0.000000	0	0.000000	0	0.000000	0
501	0.000000	0	0.000000	0	0.000000	0	0.000000	0
503	0.000000	0	0.000000	0	0.000000	0	0.000000	0
505	0.000000	0	0.000000	0	0.000000	0	0.000000	0
507	0.000000	0	0.000000	0	0.000000	0	0.000000	0
509	0.000000	0	0.000000	0	0.000000	0	0.000000	0
511	0.000000	0	0.000000	0	0.000000	0	0.000000	0
513	0.000000	0	0.000000	0	0.000000	0	0.000000	0
515	0.000000	0	0.000000	0	0.000000	0	0.000000	0
517	0.000000	0	0.000000	0	0.000000	0	0.000000	0
519	0.000000	0	0.000000	0	0.000000	0	0.000000	0
521	0.000000	0	0.000000	0	0.000000	0	0.000000	0
523	0.000000	0	0.000000	0	0.000000	0	0.000000	0
525	0.000000	0	0.000000	0	0.000000	0	0.000000	0
527	0.000000	0	0.000000	0	0.000000	0	0.000000	0

time	qEH	DirE	qEB	DirEB	qBG	DirB	qYL	DirYL
529	0.000000	0	0.000000	0	0.000000	0	0.000000	0
531	0.000000	0	0.000000	0	0.000000	0	0.000000	0
533	0.000000	0	0.000000	0	0.000000	0	0.000000	0
535	0.000000	0	0.000000	0	0.000000	0	0.000000	0
537	0.000000	0	0.000000	0	0.000000	0	0.000000	0
539	0.000000	0	0.000000	0	0.000000	0	0.000000	0
541	0.000000	0	0.000000	0	0.000000	0	0.000000	0
543	0.000000	0	0.000000	0	0.000000	0	0.000000	0
545	0.000000	0	0.000000	0	0.000000	0	0.000000	0
547	0.000000	0	0.000000	0	0.000000	0	0.000000	0
549	0.000000	0	0.000000	0	0.000000	0	0.000000	0
551	0.000000	0	0.000000	0	0.000000	0	0.000000	0
553	0.000000	0	0.000000	0	0.000000	0	0.000000	0
555	0.000000	0	0.000000	0	0.000000	0	0.000000	0
557	0.000000	0	0.000000	0	0.000000	0	0.000000	0
559	0.000000	0	0.000000	0	0.000000	0	0.000000	0
561	0.000000	0	0.000000	0	0.000000	0	0.000000	0
563	0.000000	0	0.000000	0	0.000000	0	0.000000	0
565	0.000000	0	0.000000	0	0.000000	0	0.000000	0
567	0.000000	0	0.000000	0	0.000000	0	0.000000	0
569	0.000000	0	0.000000	0	0.000000	0	0.000000	0
571	0.000000	0	0.000000	0	0.000000	0	0.000000	0
573	0.000000	0	0.000000	0	0.000000	0	0.000000	0
575	0.000000	0	0.000000	0	0.000000	0	0.000000	0
577	0.000000	0	0.000000	0	0.000000	0	0.000000	0
579	0.000000	0	0.000000	0	0.000000	0	0.000000	0
581	0.000000	0	0.000000	0	0.000000	0	0.000000	0
583	0.000000	0	0.000000	0	0.000000	0	0.000000	0
585	0.000000	0	0.000000	0	0.000000	0	0.000000	0
587	0.000000	0	0.000000	0	0.000000	0	0.000000	0
589	0.000000	0	0.000000	0	0.000000	0	0.000000	0
591	0.000000	0	0.000000	0	0.000000	0	0.000000	0
593	0.000000	0	0.000000	0	0.000000	0	0.000000	0
595	0.000000	0	0.000000	0	0.000000	0	0.000000	0
597	0.000000	0	0.000000	0	0.000000	0	0.000000	0
599	0.000000	0	0.000000	0	0.000000	0	0.000000	0
601	0.000000	0	0.000000	0	0.000000	0	0.000000	0
603	0.000000	0	0.000000	0	0.000000	0	0.000000	0
605	0.000000	0	0.000000	0	0.000000	0	0.000000	0
607	0.000000	0	0.000000	0	0.000000	0	0.000000	0
609	0.000000	0	0.000000	0	0.000000	0	0.000000	0
611	0.000000	0	0.000000	0	0.000000	0	0.000000	0
613	0.000000	0	0.000000	0	0.000000	0	0.000000	0
615	0.000000	0	0.000000	0	0.000000	0	0.000000	0

time	qEH	DirE	qEB	DirEB	qBG	DirB	qYL	DirYL
617	0.000000	0	0.000000	0	0.000000	0	0.000000	0
619	0.000000	0	0.000000	0	0.000000	0	0.000000	0
621	0.000000	0	0.000000	0	0.000000	0	0.000000	0
623	0.000000	0	0.000000	0	0.000000	0	0.000000	0
625	0.000000	0	0.000000	0	0.000000	0	0.000000	0
627	0.000000	0	0.000000	0	0.000000	0	0.000000	0
629	0.000000	0	0.000000	0	0.000000	0	0.000000	0
631	0.000000	0	0.000000	0	0.000000	0	0.000000	0
633	0.000000	0	0.000000	0	0.000000	0	0.000000	0
635	0.000000	0	0.000000	0	0.000000	0	0.000000	0
637	0.000000	0	0.000000	0	0.000000	0	0.000000	0
639	0.000000	0	0.000000	0	0.000000	0	0.000000	0
641	0.000000	0	0.000000	0	0.000000	0	0.000000	0
643	0.000000	0	0.000000	0	0.000000	0	0.000000	0
645	0.000000	0	0.000000	0	0.000000	0	0.000000	0

Appendix 5

Site 3 S4 wave and current data: Day, Hour, water depth (h, m), mean velocity 50 cm above seabed (u_{50}, m/s), velocity measurement height (z, m), mean current direction (C_{dir}), significant wave height (H_s, m), wave period (T_p, s), and wave propagation direction W_{dir}.

Day	Hour	h	u50	z	Cdir	Hs	Tp	Wdir
331	21	43.57	0.037	0.5	259	0.101	9.1	235
331	23	43.60	0.124	0.5	213	0.108	10.7	228
332	1	43.23	0.150	0.5	223	0.129	10.7	195
332	3	42.82	0.165	0.5	259	0.105	9.1	268
332	5	42.74	0.180	0.5	314	0.112	10.7	244
332	7	43.16	0.236	0.5	349	0.117	12.8	324
332	9	43.70	0.189	0.5	3	0.108	16.0	263
332	11	43.87	0.064	0.5	49	0.124	16.0	297
332	13	43.53	0.064	0.5	104	0.125	16.0	307
332	15	42.98	0.050	0.5	107	0.136	21.3	289
332	17	42.68	0.042	0.5	122	0.250	21.3	315
332	19	42.88	0.060	0.5	137	0.205	16.0	303
332	21	43.39	0.077	0.5	123	0.196	16.0	300
332	23	43.62	0.083	0.5	122	0.229	16.0	295
333	1	43.38	0.168	0.5	188	0.172	16.0	331
333	3	42.91	0.174	0.5	225	0.250	8.0	12
333	5	42.65	0.151	0.5	269	0.335	8.0	359
333	7	42.93	0.211	0.5	333	0.421	8.0	0
333	9	43.54	0.234	0.5	11	0.448	9.1	11
333	11	43.83	0.132	0.5	88	0.921	9.1	29
333	13	43.65	0.163	0.5	133	1.159	10.7	29
333	15	43.06	0.190	0.5	156	1.342	10.7	35
333	17	42.60	0.065	0.5	179	1.880	12.8	36
333	19	42.69	0.023	0.5	234	1.499	12.8	26
333	21	43.22	0.019	0.5	216	1.739	12.8	38
333	23	43.60	0.050	0.5	181	1.681	12.8	40
334	1	43.46	0.072	0.5	184	1.252	10.7	45
334	3	43.04	0.082	0.5	237	1.522	12.8	31
334	5	42.66	0.134	0.5	291	1.400	12.8	24
334	7	42.82	0.212	0.5	331	1.501	12.8	30
334	9	43.40	0.243	0.5	352	1.154	12.8	30
334	11	43.89	0.125	0.5	5	1.118	10.7	26
334	13	43.81	0.029	0.5	136	0.669	12.8	18
334	15	43.29	0.017	0.5	185	0.764	10.7	31
334	17	42.75	0.151	0.5	172	0.623	12.8	31
334	19	42.65	0.091	0.5	196	0.730	10.7	17
334	21	43.10	0.055	0.5	223	0.618	10.7	10
334	23	43.59	0.109	0.5	203	0.586	10.7	29
335	1	43.63	0.179	0.5	208	0.546	10.7	17
335	3	43.22	0.258	0.5	241	0.699	10.7	12
335	5	42.78	0.309	0.5	276	0.432	10.7	10
335	7	42.71	0.366	0.5	304	0.354	10.7	16
335	9	43.17	0.363	0.5	336	0.398	10.7	8
335	11	43.76	0.255	0.5	349	0.420	10.7	0
335	13	43.92	0.011	0.5	300	0.347	10.7	14
335	15	43.48	0.022	0.5	240	0.343	10.7	8

Day	Hour	h	u50	z	Cdir	Hs	Tp	Wdir
335	17	42.93	0.013	0.5	288	0.230	10.7	21
335	19	42.65	0.013	0.5	219	0.221	10.7	10
335	21	42.93	0.028	0.5	262	0.142	10.7	18
335	23	43.48	0.070	0.5	183	0.187	10.7	356
336	1	43.71	0.157	0.5	193	0.151	10.7	347
336	3	43.40	0.071	0.5	177	0.145	10.7	318
336	5	42.92	0.167	0.5	235	0.132	12.8	273
336	7	42.71	0.082	0.5	306	0.144	10.7	354
336	9	42.97	0.242	0.5	332	0.112	10.7	348
336	11	43.58	0.205	0.5	354	0.096	10.7	161
336	13	43.93	0.063	0.5	2	0.094	12.8	349
336	15	43.69	0.055	0.5	113	0.092	10.7	350
336	17	43.10	0.029	0.5	126	0.103	12.8	340
336	19	42.73	0.021	0.5	128	0.094	9.1	344
336	21	42.82	0.028	0.5	111	0.111	10.7	342
336	23	43.32	0.081	0.5	130	0.086	12.8	322
337	1	43.72	0.155	0.5	164	0.104	12.8	337
337	3	43.60	0.107	0.5	164	0.117	12.8	321
337	5	43.13	0.145	0.5	222	0.095	10.7	302
337	7	42.79	0.237	0.5	266	0.094	16.0	345
337	9	42.85	0.246	0.5	315	0.123	16.0	330
337	11	43.36	0.236	0.5	344	0.094	16.0	326
337	13	43.86	0.165	0.5	5	0.072	12.8	0
337	15	43.83	0.019	0.5	111	0.098	16.0	343
337	17	43.33	0.014	0.5	232	0.098	12.8	353
337	19	42.86	0.019	0.5	296	0.138	12.8	351
337	21	42.76	0.033	0.5	278	0.178	8.0	360
337	23	43.14	0.006	0.5	179	0.200	12.8	349
338	1	43.62	0.052	0.5	144	0.214	8.0	359
338	3	43.70	0.112	0.5	175	0.293	8.0	356
338	5	43.32	0.101	0.5	183	0.219	9.1	348
338	7	42.89	0.050	0.5	235	0.356	10.7	343
338	9	42.77	0.041	0.5	304	0.254	9.1	342
338	11	43.13	0.125	0.5	353	0.230	9.1	357
338	13	43.69	0.085	0.5	21	0.246	10.7	2
338	15	43.83	0.059	0.5	145	0.277	9.1	353
338	17	43.48	0.081	0.5	174	0.253	10.7	351
338	19	43.00	0.020	0.5	190	0.253	10.7	356
338	21	42.72	0.017	0.5	96	0.266	9.1	1
338	23	42.94	0.015	0.5	73	0.228	9.1	345
339	1	43.41	0.028	0.5	113	0.255	10.7	335
339	3	43.70	0.099	0.5	180	0.215	9.1	335
339	5	43.46	0.041	0.5	218	0.207	10.7	339
339	7	43.07	0.100	0.5	258	0.157	9.1	1
339	9	42.80	0.148	0.5	281	0.192	10.7	355
339	11	42.93	0.229	0.5	331	0.207	9.1	338

Day	Hour	h	u50	z	Cdir	Hs	Tp	Wdir
339	13	43.42	0.245	0.5	351	0.230	9.1	340
339	15	43.78	0.052	0.5	17	0.238	9.1	339
339	17	43.62	0.039	0.5	184	0.256	9.1	343
339	19	43.18	0.064	0.5	201	0.227	10.7	337
339	21	42.80	0.020	0.5	239	0.254	9.1	336
339	23	42.75	0.029	0.5	257	0.235	10.7	359
340	1	43.14	0.076	0.5	357	0.260	9.1	339
340	3	43.63	0.056	0.5	149	0.247	10.7	336
340	5	43.66	0.152	0.5	187	0.239	9.1	350
340	7	43.34	0.087	0.5	204	0.346	9.1	85
340	9	42.92	0.034	0.5	239	0.550	9.1	358
340	11	42.78	0.029	0.5	295	0.735	9.1	359
340	13	43.13	0.130	0.5	340	0.566	9.1	8
340	15	43.60	0.052	0.5	10	1.104	10.7	21
340	17	43.68	0.026	0.5	173	1.093	10.7	24
340	19	43.33	0.027	0.5	166	1.161	12.8	17
340	21	42.88	0.042	0.5	147	1.181	12.8	22
340	23	42.67	0.104	0.5	234	1.664	12.8	47
341	1	42.87	0.083	0.5	292	2.019	12.8	32
341	3	43.42	0.057	0.5	308	2.095	16.0	44
341	5	43.69	0.016	0.5	185	1.455	12.8	51
341	7	43.52	0.023	0.5	196	1.515	12.8	43
341	9	43.14	0.015	0.5	199	1.250	12.8	44
341	11	42.84	0.075	0.5	298	1.248	12.8	38
341	13	42.93	0.156	0.5	325	1.169	12.8	45
341	15	43.37	0.109	0.5	348	0.968	12.8	46
341	17	43.65	0.033	0.5	95	0.904	12.8	41
341	19	43.54	0.104	0.5	153	0.618	10.7	32
341	21	43.11	0.108	0.5	155	0.739	12.8	31
341	23	42.74	0.025	0.5	182	0.527	12.8	43
342	1	42.70	0.008	0.5	249	0.562	10.7	30
342	3	43.18	0.006	0.5	46	0.428	10.7	36
342	5	43.66	0.040	0.5	150	0.350	10.7	16
342	7	43.71	0.108	0.5	167	0.318	10.7	28
342	9	43.38	0.104	0.5	178	0.261	10.7	357
342	11	42.95	0.022	0.5	208	0.297	10.7	4
342	13	42.71	0.021	0.5	315	0.249	10.7	346
342	15	42.96	0.056	0.5	357	0.197	10.7	347
342	17	43.45	0.054	0.5	114	0.268	10.7	4
342	19	43.60	0.130	0.5	142	0.213	9.1	22
342	21	43.32	0.106	0.5	142	0.323	10.7	337
342	23	42.87	0.096	0.5	179	0.275	10.7	343
343	1	42.63	0.170	0.5	247	0.267	9.1	335
343	3	42.89	0.174	0.5	303	0.274	10.7	336
343	5	43.34	0.126	0.5	345	5.110	64.0	296
343	7	43.81	0.076	0.5	21	0.238	10.7	319

Day	Hour	h	u50	z	Cdir	Hs	Tp	Wdir
343	9	43.66	0.076	0.5	163	0.248	9.1	330
343	11	43.15	0.051	0.5	177	0.214	10.7	316
343	13	42.72	0.029	0.5	224	0.191	9.1	315
343	15	42.75	0.098	0.5	295	0.223	12.8	317
343	17	43.22	0.128	0.5	321	0.193	10.7	305

Appendix 6

Site 3 RALPH wave, current and sediment suspension data: Day, Hour, total time (hour), water depth (h, m), mean velocity at 50 cm above seabed (u_{50}, m/s), mean velocity at 100 cm above seabed (u_{100}, m/s), mean current direction of u_{100} (C_{dir}), significant wave height (H_s, m), wave period (T_p, s), wave propagation direction W_{dir}, transmission percentages at 33 cm and 68 cm above seabed (C_{33} and C_{68}).

Day	Hour	time	h	u50	u100	Cdir	Hs	Tp	Wdir	C33	C68
332	1	1	44.05	0.123	0.158	142	0.26	10.7	205	94.60	90.26
332	5	5	43.50	0.180	0.210	244	0.28	10.7	155	94.35	89.52
332	9	9	44.47	0.131	0.214	297	0.26	9.8	190	94.63	90.15
332	13	13	44.38	0.033	0.069	29	0.27	18.3	197	93.85	87.48
332	17	17	43.48	0.059	0.107	9	0.34	18.3	228	94.42	89.35
332	21	21	44.09	0.029	0.063	15	0.32	18.3	237	93.95	87.07
333	1	25	44.23	0.161	0.186	117	0.32	16.0	231	93.11	85.31
333	5	29	43.48	0.149	0.157	201	0.40	8.0	302	93.07	84.80
333	9	33	44.28	0.106	0.208	304	0.73	8.5	306	93.85	87.32
333	13	37	44.50	0.114	0.173	52	1.17	9.8	327	90.18	73.82
333	17	41	43.41	0.045	0.078	84	1.78	11.6	335	85.56	59.26
333	21	45	43.96	0.011	0.005	14	1.79	11.6	339	85.43	57.48
334	1	49	44.34	0.040	0.042	95	1.74	12.8	330	87.29	63.02
334	5	53	43.54	0.073	0.105	227	1.54	12.8	328	93.60	85.30
334	9	57	44.14	0.150	0.247	280	1.25	11.6	325	94.24	86.55
334	13	61	44.70	0.015	0.018	55	0.95	11.6	327	86.87	62.38
334	17	65	43.63	0.017	0.011	84	0.84	11.6	330	44.58	9.86
334	21	69	43.86	0.036	0.038	158	0.78	10.7	317	71.33	39.05
335	1	73	44.50	0.127	0.171	130	0.61	10.7	316	95.00	90.01
335	5	77	43.63	0.259	0.323	212	0.66	10.7	312	94.29	86.64
335	9	81	43.92	0.262	0.368	267	0.48	10.7	300	92.54	79.37
335	13	85	44.78	0.037	0.070	295	0.38	10.7	323	94.60	87.97
335	17	89	43.80	0.075	0.093	128	0.36	9.8	308	94.10	86.84
335	21	93	43.68	0.084	0.169	318	0.29	9.8	238	90.77	73.74
336	1	97	44.55	0.013	0.025	82	0.29	10.7	285	92.13	79.45
336	5	101	43.79	0.022	0.032	232	0.28	10.7	23	93.64	86.32
336	9	105	43.73	0.152	0.208	267	0.26	12.8	348	88.33	69.95
336	13	109	44.76	0.075	0.121	326	0.27	8.5	284	94.63	88.36
336	17	113	44.00	0.051	0.082	12	0.25	12.8	219	94.94	89.60
336	21	117	43.59	0.053	0.080	351	0.28	10.7	268	94.55	87.91
337	1	121	44.54	0.079	0.131	39	0.25	10.7	302	92.87	81.66
337	5	125	44.02	0.101	0.127	139	0.26	16.0	3	93.21	82.66
337	9	129	43.63	0.166	0.255	245	0.26	14.2	308	89.04	71.22
337	13	133	44.67	0.121	0.199	303	0.26	8.0	302	95.35	91.34
337	17	137	44.23	0.017	0.010	266	0.27	10.7	295	95.50	92.54
337	21	141	43.55	0.049	0.096	311	0.28	8.0	300	95.23	91.10
338	1	145	44.41	0.065	0.109	52	0.33	9.8	307	94.03	86.82
338	5	149	44.20	0.071	0.087	69	0.36	9.1	290	93.09	83.30
338	9	153	43.59	0.046	0.063	266	0.38	9.1	282	92.38	82.40
338	13	157	44.46	0.077	0.129	297	0.33	8.5	288	94.81	89.65
338	17	161	44.37	0.078	0.091	82	0.34	11.6	284	93.83	86.20
338	21	165	43.53	0.042	0.058	344	0.38	10.7	276	92.67	84.65
339	1	169	44.18	0.050	0.071	349	0.35	10.7	279	93.56	85.14
339	5	173	44.36	0.072	0.077	108	0.32	10.7	280	94.68	88.99

Day	Hour	time	h	u50	u100	Cdir	Hs	Tp	Wdir	C33	C68
339	9	177	43.66	0.174	0.201	213	0.33	9.8	271	93.69	86.10
339	13	181	44.18	0.145	0.242	295	0.30	11.6	275	95.25	90.99
339	17	185	44.52	0.038	0.063	56	0.31	9.1	277	95.72	93.10
339	21	189	43.66	0.030	0.061	292	0.35	10.7	278	95.21	91.64
340	1	193	43.92	0.081	0.143	306	0.34	9.1	274	95.33	91.81
340	5	197	44.52	0.022	0.043	43	0.36	9.1	283	94.97	89.88
340	9	201	43.78	0.029	0.033	168	0.59	9.1	299	94.20	88.09
340	13	205	43.86	0.089	0.154	286	0.55	9.8	297	95.02	90.04
340	17	209	44.53	0.018	0.045	47	1.12	11.6	319	94.46	88.52
340	21	213	43.74	0.034	0.060	52	1.63	11.6	329	92.22	80.46
341	1	217	43.63	0.048	0.074	229	1.88	14.2	335	91.97	79.71
341	5	221	44.52	0.009	0.015	239	1.56	12.8	348	93.70	85.18
341	9	225	44.02	0.032	0.051	244	1.17	12.8	348	91.98	76.95
341	13	229	43.69	0.095	0.162	265	1.10	11.6	338	94.51	87.10
341	17	233	44.46	0.028	0.066	355	0.98	11.6	342	95.41	90.72
341	21	237	44.02	0.084	0.108	74	0.73	12.8	333	93.30	82.54
342	1	241	43.49	0.030	0.073	314	0.57	11.6	335	85.74	62.38
342	5	245	44.42	0.039	0.072	42	0.50	10.7	305	91.91	78.96
342	9	249	44.27	0.083	0.095	102	0.44	10.7	302	90.67	75.66
342	13	253	43.52	0.033	0.069	302	0.39	11.6	304	93.08	82.67
342	17	257	44.23	0.055	0.109	323	0.37	10.7	301	95.39	90.68
342	21	261	44.19	0.086	0.122	64	0.37	9.1	285	92.44	81.00
343	1	265	43.46	0.123	0.135	174	0.39	9.8	288	93.84	84.68
343	5	269	44.22	0.078	0.129	289	0.33	9.1	291	84.89	58.13
343	9	273	44.54	0.059	0.081	63	0.32	9.8	252	95.56	91.64
343	13	277	43.58	0.017	0.017	95	0.35	12.8	252	95.37	90.61
343	17	281	43.96	0.115	0.154	269	0.29	10.7	213	94.24	87.47
343	21	285	44.46	0.038	0.052	130	0.29	9.1	244	95.71	92.31
344	1	289	43.60	0.156	0.163	191	0.35	9.8	218	92.53	82.12
344	5	293	43.97	0.142	0.217	277	0.42	9.8	250	94.78	88.26
344	9	297	44.78	0.082	0.116	20	0.35	9.8	233	95.35	90.49
344	13	301	43.79	0.018	0.019	64	0.37	9.8	230	94.80	88.13
344	17	305	43.68	0.047	0.077	324	0.37	9.1	241	93.27	82.59
344	21	309	44.57	0.099	0.120	74	0.36	9.8	250	87.62	67.67
345	1	313	43.76	0.163	0.223	137	0.33	10.7	171	93.54	82.89
345	5	317	43.61	0.181	0.226	255	0.38	9.8	218	95.37	90.64
345	9	321	44.79	0.070	0.113	340	0.34	9.8	227	95.72	92.03
345	13	325	44.02	0.090	0.105	76	0.34	10.7	220	94.61	87.98
345	17	329	43.40	0.040	0.087	293	0.41	8.0	269	90.41	75.43
345	21	333	44.53	0.010	0.016	69	0.71	9.1	308	88.57	70.37
346	1	337	43.97	0.069	0.103	122	1.24	10.7	313	90.74	73.11
346	5	341	43.35	0.118	0.200	249	1.86	11.6	309	92.10	78.54
346	9	345	44.75	0.044	0.133	296	2.45	11.6	318	92.54	84.30
346	13	349	44.36	0.065	0.076	65	3.84	14.2	319	76.95	38.81

Day	Hour	time	h	u50	u100	Cdir	Hs	Tp	Wdir	C33	C68
346	17	353	43.30	0.031	0.012	145	4.31	14.2	306	82.23	53.82
346	21	357	44.38	0.024	0.020	57	3.07	14.2	298	81.63	49.71
347	1	361	44.29	0.032	0.015	56	3.30	14.2	293	73.07	28.97
347	5	365	43.35	0.046	0.073	221	2.99	14.2	296	77.69	38.18
347	9	369	44.56	0.058	0.164	286	2.70	14.2	294	92.41	76.96
347	13	373	44.72	0.014	0.013	6	2.49	14.2	294	81.34	45.06
347	17	377	43.43	0.027	0.030	357	2.30	12.8	286	83.70	51.18
347	21	381	44.14	0.021	0.013	15	2.36	12.8	289	61.70	10.97
348	1	385	44.57	0.027	0.004	62	1.85	14.2	283	63.41	11.77
348	5	389	43.46	0.109	0.175	215	1.88	12.8	293	80.43	38.89
348	9	393	44.23	0.212	0.337	269	1.73	12.8	280	94.22	79.75
348	13	397	44.93	0.006	0.018	39	1.71	12.8	281	83.30	45.50
348	17	401	43.61	0.011	0.007	16	1.41	11.6	288	73.73	25.58
348	21	405	43.80	0.035	0.047	335	1.23	12.8	279	78.79	34.32
349	1	409	44.67	0.021	0.034	35	0.95	11.6	274	74.34	26.97
349	5	413	43.62	0.107	0.137	186	0.96	9.8	271	95.12	84.00
349	9	417	43.85	0.132	0.220	272	1.09	10.7	259	96.33	88.42
349	13	421	44.93	0.054	0.094	4	0.69	11.6	262	93.44	77.07
349	17	425	43.82	0.036	0.077	39	0.61	10.7	272	90.67	69.72
349	21	429	43.62	0.044	0.074	343	0.62	9.8	261	69.93	28.26
350	1	433	44.72	0.070	0.132	27	0.73	11.6	258	44.56	7.11
350	5	437	43.88	0.185	0.215	180	0.65	11.6	259	96.51	89.76
350	9	441	43.66	0.143	0.207	255	0.63	11.6	260	95.84	86.44
350	13	445	44.86	0.090	0.178	313	0.59	10.7	222	96.37	88.24
350	17	449	44.08	0.059	0.075	139	0.55	8.5	210	96.02	87.39
350	21	453	43.56	0.192	0.258	220	0.95	9.8	165	96.13	87.43
351	1	457	44.66	0.135	0.195	237	1.21	10.7	168	95.95	86.75
351	5	461	44.20	0.161	0.218	211	1.18	9.8	174	96.26	88.52
351	9	465	43.68	0.209	0.297	248	0.94	10.7	171	97.65	94.15
351	13	469	44.73	0.122	0.215	285	0.93	11.6	183	97.66	94.38
351	17	473	44.35	0.082	0.109	83	0.91	10.7	190	97.43	93.06
351	21	477	43.60	0.064	0.080	149	0.70	10.7	204	97.74	94.74
352	1	481	44.45	0.008	0.017	18	0.56	9.8	209	97.15	93.44
352	5	485	44.33	0.156	0.178	113	0.52	9.1	222	97.75	93.64
352	9	489	43.68	0.021	0.026	247	0.43	12.8	246	97.35	93.33
352	13	493	44.44	0.078	0.149	308	0.38	10.7	253	97.61	94.25
352	17	497	44.46	0.133	0.168	67	0.39	12.8	271	97.87	93.72
352	21	501	43.67	0.079	0.088	120	0.40	12.8	254	97.04	91.51
353	1	505	44.26	0.025	0.053	332	0.35	14.2	249	96.86	92.12
353	5	509	44.52	0.115	0.130	120	0.35	12.8	268	96.36	88.96
353	9	513	43.82	0.054	0.075	230	0.36	14.2	258	97.58	93.87
353	13	517	44.26	0.089	0.157	310	0.32	14.2	255	96.05	88.44
353	17	521	44.58	0.128	0.181	55	0.32	10.7	239	97.82	93.92
353	21	525	43.88	0.120	0.136	87	0.33	12.8	260	97.87	94.14

Day	Hour	time	h	u50	u100	Cdir	Hs	Tp	Wdir	C33	C68
354	1	529	44.05	0.012	0.038	303	0.91	9.8	322	90.75	73.17
354	5	533	44.55	0.045	0.071	57	1.69	10.7	309	95.16	87.52
354	9	537	43.90	0.029	0.050	76	1.43	11.6	320	96.78	92.15
354	13	541	43.93	0.012	0.004	140	1.52	12.8	322	95.71	88.35
354	17	545	44.44	0.078	0.107	63	1.57	12.8	318	94.72	86.12
354	21	549	43.86	0.036	0.052	43	1.24	11.6	314	96.42	90.07
355	1	553	43.86	0.016	0.029	260	1.07	11.6	318	93.11	76.12
355	5	557	44.54	0.044	0.083	262	0.93	10.7	312	96.93	91.48
355	9	561	44.12	0.002	0.011	320	0.72	10.7	312	97.08	91.94
355	13	565	43.87	0.025	0.083	297	0.69	9.8	299	96.12	88.09
355	17	569	44.48	0.011	0.030	299	0.61	9.8	301	91.07	68.91
355	21	573	44.09	0.012	0.012	313	0.57	9.8	291	60.60	27.95
356	1	577	43.84	0.062	0.088	211	0.59	9.8	298	50.54	13.92
356	5	581	44.52	0.071	0.104	232	0.59	9.1	298	87.67	60.43
356	9	585	44.24	0.014	0.019	211	1.19	9.8	312	82.32	43.21
356	13	589	43.85	0.013	0.013	119	1.37	11.6	315	77.47	33.63
356	17	593	44.26	0.037	0.053	37	2.12	12.8	316	93.29	80.22
356	21	597	44.13	0.021	0.044	65	2.32	12.8	328	90.38	69.50
357	1	601	43.73	0.009	0.016	273	3.32	12.8	348	93.95	86.10
357	5	605	44.26	0.018	0.053	310	2.54	12.8	2	90.72	70.18
357	9	609	44.39	0.003	0.011	354	2.01	12.8	13	88.82	62.20
357	13	613	43.80	0.010	0.003	27	1.49	11.6	360	88.18	57.90
357	17	617	44.18	0.020	0.015	320	1.21	10.7	355	83.15	44.25
357	21	621	44.34	0.010	0.014	42	0.76	10.7	1	44.97	7.04
358	1	625	43.77	0.013	0.020	244	0.76	11.6	355	19.44	7.03
358	5	629	44.21	0.079	0.120	271	0.48	9.8	331	94.47	80.84
358	9	633	44.60	0.023	0.019	169	0.66	8.5	146	78.11	40.54
358	13	637	43.92	0.008	0.013	316	0.58	9.1	162	86.44	59.16
358	17	641	43.99	0.013	0.021	241	0.88	11.6	304	59.57	22.24
358	21	645	44.42	0.010	0.050	21	0.85	12.8	308	31.70	8.49
359	1	649	43.89	0.038	0.082	5	0.68	11.6	305	89.29	63.71
359	5	653	43.96	0.035	0.069	323	0.49	10.7	306	91.50	70.84
359	9	657	44.59	0.029	0.047	76	0.48	10.7	313	88.02	64.70
359	13	661	44.04	0.016	0.028	12	0.40	11.6	301	86.72	70.74
359	17	665	43.86	0.024	0.052	35	0.37	10.7	295	78.45	50.83
359	21	669	44.52	0.012	0.010	36	0.56	10.7	287	75.81	41.99
360	1	673	43.92	0.021	0.019	193	0.69	9.8	309	65.89	26.67
360	5	677	43.73	0.074	0.168	307	0.87	9.8	293	95.89	85.11
360	9	681	44.58	0.077	0.125	35	0.95	10.7	292	96.38	87.34
360	13	685	44.09	0.048	0.088	43	0.90	9.8	294	95.52	84.69
360	17	689	43.60	0.032	0.065	19	1.18	11.6	307	92.04	72.36
360	21	693	44.40	0.036	0.071	65	1.03	11.6	310	80.47	39.11
361	1	697	43.93	0.175	0.250	86	1.79	10.7	0	92.70	73.62
361	5	701	43.47	0.059	0.114	82	4.91	12.8	18	83.51	55.49

Day	Hour	time	h	u50	u100	Cdir	Hs	Tp	Wdir	C33	C68
361	9	705	44.43	0.073	0.210	65	4.47	12.8	15	83.82	59.34
361	13	709	44.10	0.222	0.346	81	3.93	14.2	17	88.23	66.82
361	17	713	43.34	0.136	0.236	91	4.09	14.2	13	84.40	63.17
361	21	717	44.14	0.129	0.250	82	3.61	12.8	18	86.41	66.63
362	1	721	44.03	0.265	0.394	108	2.69	12.8	9	90.48	76.44
362	5	725	43.46	0.055	0.068	129	2.12	12.8	6	9.48	79.99
362	9	729	44.42	0.046	0.121	292	1.39	10.7	8	0.28	88.19
362	13	733	44.52	0.051	0.087	91	1.03	11.6	13	0.18	84.82
362	17	737	43.48	0.079	0.130	133	0.85	11.6	5	0.08	92.74
362	21	741	44.23	0.037	0.065	261	0.61	9.8	8	0.18	92.94
363	1	745	44.41	0.107	0.143	116	0.44	9.1	4	0.37	95.06
363	5	749	43.57	0.091	0.125	227	0.43	9.8	6	0.18	96.12
363	9	753	44.29	0.113	0.276	295	0.37	9.1	24	0.18	95.40
363	13	757	44.75	0.022	0.037	161	0.33	8.5	8	0.08	85.76
363	17	761	43.64	0.133	0.160	115	0.27	9.8	2	0.37	88.80
363	21	765	44.06	0.056	0.073	218	0.28	9.8	335	0.28	95.22
364	1	769	44.64	0.099	0.129	120	0.28	9.8	325	0.37	94.83
364	5	773	43.71	0.117	0.157	198	0.26	9.1	25	0.27	95.22
364	9	777	44.18	0.199	0.359	283	0.26	4.1	321	0.27	95.58
364	13	781	44.95	0.095	0.135	8	0.38	8.0	246	0.37	87.17
364	17	785	43.84	0.033	0.066	12	0.80	9.1	256	0.37	88.05
364	21	789	43.70	0.130	0.282	23	3.08	10.7	348	19.82	79.54
365	1	793	44.36	0.287	0.465	73	2.69	11.6	32	20.50	71.37
365	5	797	43.50	0.333	0.454	119	2.49	11.6	33	19.77	71.91
365	9	801	43.63	0.079	0.125	187	1.73	10.7	13	20.98	88.40
365	13	805	44.77	0.014	0.037	238	1.59	11.6	9	29.96	92.23
365	17	809	43.89	0.063	0.122	210	0.90	11.6	9	24.11	93.86
365	21	813	43.64	0.077	0.156	282	0.95	10.7	3	97.67	93.18

Appendix 7

The results of Site 3 seabed image analyses. The listed parameters are time (hour), film-frame number (fm#), bed type (bed), current- and wave-ripple orientations (C_r, W_r), current ripple length and height (L_{rc}, H_{rc} in cm), wave ripple length and height (L_{rw}, H_{rw} in cm), ripple migration rate (M_r, cm/minute), ripple migration direction (M_{dir}) and bedform transport rate (q_r, 10^{-3} kg m^{-1} s^{-1}). See text for bed type definitions.

time	fm#	bed	Cr	Wr	Lrc	Hrc	Lrw	Hrw	Mr	Mdir	qr
1	198	NM									
5	207	NM									
9	216	NM									
13	225	NM									
17	234	NM									
21	243	NM									
25	256	DM									
29	265	NM									
33	274	DM									
37	283	DM									
41	292	DM									
45	301	DM									
49	315	DM									
53	324	LWR		250			37.90	4.93			
57	333	Wc		118			12.25	1.59	0.2369	288	0.5656
61	342	NM									
65	351	NM									
69	360	NM									
73	375	WC		228			10.77	1.40	0.0592	138	0.1244
77	384	C	268		10.90	1.27			0.1579	220	0.3008
81	393	C	288				15.11	1.96	0.2813	265	0.8289
85	402	NM									
89	411	NM									
93	420	NM									
97	436	NM									
101	445	NM									
105	454	NM									
109	463	NM									
113	472	NM									
117	481	NM									
121	498	NM									
125	507	NM									
129	516	DM									
133	525	NM									
137	534	NM									
141	543	NM									
145	561	NM									
149	570	NM									
153	579	NM									
157	588	NM									
161	597	NM									
165	606	NM									
169	625	NM									
173	634	NM									

time	fm#	bed	Cr	Wr	Lrc	Hrc	Lrw	Hrw	Mr	Mdir	qr
177	643	NM									
181	652	C	308		8.80	0.98			0.0390	218	0.0573
185	661	NM									
189	670	NM									
193	680	NM									
197	689	NM									
201	698	NM									
205	707	WC	313	288	7.40	0.80	8.60	1.12	0.0518	220	0.0622
209	716	W									
213	725	LWR		230			34.00	4.42			
217	736	LWR/SS					44.30	5.80			
221	745	LWR					103.00	13.40			
225	754	LWR		relict, no migration							
229	763	LWR		relict, no migration							
233	772	Wc	93	88	7.30	0.79	13.00	1.69	0.0977	359	0.3001
237	781	Wc	118	48	7.12	0.77	18.24	2.37	0.0592	28	0.0680
241	793	NM									
245	802	NM									
249	811	NM									
253	820	NM									
257	829	NM									
261	838	NM									
265	851	NM									
269	860	NM									
273	869	NM									
277	878	NM									
281	887	NM									
285	896	NM									
289	910	NM									
293	919	NM									
297	928	NM									
301	937	NM									
305	946	NM									
309	955	NM									
313	970	NM									
317	979	C									
321	988	NM									
325	997	NM									
329	1006	NM									
333	1015	NM									
337	1031	LWR		238			50.00	6.50			
341	1040	LWR		243			56.28	7.32	0.0987	333	1.0831
345	1049	SS									
349	1058	UPB									

time	fm#	bed	Cr	Wr	Lrc	Hrc	Lrw	Hrw	Mr	Mdir	qr
353	1067	UPB									
357	1076	UPB									
361	1093	UPB									
365	1102	UPB									
369	1111	UPB									
373	1120	DM									
377	1129	DM									
381	1138	DM									
385	1156	DM									
389	1165	Wc									
393	1174	LWR/SS		155							
397	1183	DM									
401	1192	DM									
405	1201	DM									
409	1220	Wc									
413	1229	WC	160		4.52	0.45			0.1086	250	0.0725
417	1238	WC							0.2369	306	
421	1247	NM									
425	1256	NM									
429	1265	NM									
433	1275	Cw	263	183	8.30	0.92	0.00	0.00	0.2160	143	0.2970
437	1284	WC	198	161			10.30	1.32	0.2310	248	0.4610
441	1293	WC	213	183	10.42	1.20	15.63	2.03	0.0987	281	0.4782
445	1302	NM									
449	1311	NM									
453	1320	C	278		13.03	1.57			0.2566	220	0.6043
457	1331	W		266			27.97	3.64			
461	1340	Wc	138	258	8.86	0.99	33.90	4.40	0.7775	184	1.5550
465	1349	C	153		20.60	1.70			0.4441	243	1.1325
469	1358	Wc		120			18.76	2.44	0.2566	288	0.9387
473	1367	Wc		264			14.59	1.90	0.0987	358	0.2808
477	1376	Wc		268			12.25	1.59	0.0592	348	0.1414
481	1388	NM									
485	1397	NM									
489	1406	NM									
493	1415	NM									
497	1424	NM									
501	1433	NM									
505	1446	NM									
509	1455	NM									
513	1464	NM									
517	1473	NM									
521	1482	DM									
525	1491	NM									

time	fm#	bed	Cr	Wr	Lrc	Hrc	Lrw	Hrw	Mr	Mdir	qr
529	1505	Wc									
533	1514	LWR		228			34.40	4.47			
537	1523	LWR		228			34.40	4.47	0.2073	318	1.3897
541	1532	Wc		223			23.90	3.11	0.2073	313	0.9671
545	1541	Wc									
549	1550	Wc		228			14.85	1.93	0.1678	288	0.4859
553	1565	W		273			12.00	1.56			
557	1574	WC	148	258	10.25	1.18	32.50	4.20	0.0629	187	0.4573
561	1583	NM									
565	1592	NM									
569	1601	NM									
573	1610	NM									
577	1626	NM									
581	1635	NM									
585	1644	DM									
589	1653	DM									
593	1662	LWR/SS		202					0.3454	288	
597	1671	LWR/SS					32.80	4.26			
601	1688	LWR/SS									
605	1697	UPB									
609	1706	UPB									
613	1715	LWR		263	relict lwr						
617	1724	DM									
621	1733	NM									
625	1751	NM									
629	1760	NM									
633	1769	NM									
637	1778	NM									
641	1787	DM									
645	1796	DM									
649	1815	DM									
653	1824	NM									
657	1833	NM									
661	1842	NM									
665	1851	NM									
669	1860	NM									
673	1870	NM									
677	1879	Wc	288	230	6.3	0.7	13.03	1.69	0.3944	332	1.2438
681	1888	WC	266	228	9.64	1.10	26.06	3.39			
685	1897	NM									
689	1906	Wc		243							
693	1915	DM									
697	1926	W/SS		poor visibility							
701	1935	UPB									

time	fm#	bed	Cr	Wr	Lrc	Hrc	Lrw	Hrw	Mr	Mdir	qr
705	1944	UPB									
709	1953	UPB									
713	1962	UPB									
717	1971	UPB									
721	1983	UPB									
725	1992	LWR/SS									
729	2001	Wc									
733	2010	W									
737	2019	C	288		6.77	0.72			0.1184	18	0.1281
741	2028	NM									
745	2041	NM									
749	2050	NM									
753	2059	WC	168	143	6.43	0.68			0.0829	258	0.0846
757	2068	NM									
761	2077	NM									
765	2086	NM									
769	2100	NM									
773	2109	NM									
777	2118	Cw	175		6.77	0.72			0.0740	273	0.0799
781	2127	NM									
785	2136	NM		relict lwr; no migration							
789	2145	UPB									
793	2160	UPB									
797	2169	LWR/SS									
801	2178	LWR	relict lwr				52.11	6.77		208	2.0058
805	2187	LWR		288			52.11	6.77			
809	2196	LWR		288			52.11	6.77	0.1184	198	1.2035
813	2205	Wc		108			12.51	1.63			

Appendix 8

Site 3 output data of GSC continental shelf sediment transport model SEDTRANS92: (A) bottom boundary layer parameters and (B) sediment transport rates and directions. Listed parameters are defined the same as in Appendix 4.

time	ub	Ab	fcws	u*cs	u*ws	u*cws	u*c	u*w	u*cw	dcw	z0	z0c
1	0.030	0.051	0.0185	0.66	0.46	0.75	1.12	1.15	1.48	2.02	0.21	0.36
5	0.034	0.057	0.0174	0.83	0.52	0.86	1.42	1.25	1.61	2.19	0.21	0.27
9	0.024	0.038	0.0177	0.85	0.45	0.90	1.45	1.08	1.64	2.05	0.21	0.27
13	0.053	0.153	0.0155	0.36	0.55	0.66	0.61	1.37	1.49	3.48	0.21	1.10
17	0.067	0.195	0.0140	0.54	0.69	0.85	0.92	1.64	1.84	4.30	0.21	0.95
21	0.063	0.182	0.0153	0.35	0.61	0.69	0.58	1.52	1.60	3.74	0.21	1.31
25	0.059	0.149	0.0140	0.81	0.69	0.98	1.40	1.60	1.96	3.98	0.21	0.48
29	0.020	0.025	0.0224	0.62	0.37	0.66	1.06	0.95	1.25	1.28	0.21	0.27
33	0.044	0.059	0.0171	0.91	0.68	1.13	1.45	1.48	2.07	2.24	0.14	0.32
37	0.111	0.172	0.0158	0.82	1.08	1.18	1.35	2.43	2.51	3.14	0.14	0.59
41	0.241	0.444	0.0315	0.56	1.91	1.94	1.01	5.39	5.43	8.02	0.41	4.60
45	0.239	0.440	0.0300	0.05	1.88	1.88	0.08	5.27	5.27	7.78	0.39	7.45
49	0.259	0.529	0.0311	0.36	2.00	2.02	0.62	5.62	5.64	9.19	0.43	6.58
53	0.235	0.479	0.0288	0.70	1.85	1.88	1.29	5.08	5.12	8.34	0.39	3.85
57	0.166	0.307	0.0326	1.25	1.59	1.94	2.40	4.27	4.76	7.03	0.39	1.64
61	0.124	0.229	0.0153	0.14	1.08	1.08	0.20	2.45	2.45	3.62	0.14	2.77
65	0.114	0.210	0.0157	0.09	1.01	1.01	0.13	2.59	2.59	3.83	0.21	3.31
69	0.092	0.156	0.0170	0.25	0.88	0.91	0.39	2.29	2.32	3.16	0.21	2.00
73	0.069	0.118	0.0153	0.81	0.84	1.17	1.30	1.82	2.23	3.04	0.14	0.51
77	0.077	0.132	0.0140	1.32	0.97	1.46	2.18	2.06	2.62	3.57	0.15	0.26
81	0.057	0.096	0.0296	1.54	0.90	1.75	2.58	1.93	3.17	4.31	0.19	0.33
85	0.043	0.074	0.0201	0.35	0.52	0.62	0.59	1.39	1.50	2.04	0.21	0.84
89	0.035	0.055	0.0205	0.44	0.48	0.65	0.73	1.27	1.46	1.83	0.21	0.62
93	0.028	0.044	0.0194	0.68	0.45	0.73	1.17	1.13	1.42	1.77	0.21	0.31
97	0.033	0.057	0.0244	0.14	0.39	0.41	0.22	1.13	1.15	1.57	0.21	1.07
101	0.033	0.055	0.0242	0.18	0.39	0.42	0.28	1.12	1.15	1.56	0.21	0.96
105	0.040	0.082	0.0158	0.84	0.57	0.91	1.45	1.34	1.72	2.81	0.21	0.32
109	0.016	0.021	0.0233	0.50	0.31	0.57	0.85	0.81	1.13	1.22	0.21	0.33
113	0.038	0.077	0.0188	0.39	0.47	0.60	0.66	1.22	1.37	2.24	0.21	0.71
117	0.033	0.055	0.0231	0.35	0.40	0.46	0.61	1.12	1.16	1.59	0.21	0.54
121	0.029	0.049	0.0206	0.53	0.41	0.59	0.93	1.07	1.23	1.67	0.21	0.35
125	0.047	0.120	0.0153	0.58	0.57	0.78	1.00	1.36	1.63	3.32	0.21	0.61
129	0.044	0.100	0.0137	1.05	0.65	1.16	1.68	1.33	1.99	3.60	0.14	0.23
133	0.012	0.015	0.0198	0.80	0.32	0.86	1.35	0.78	1.56	1.59	0.21	0.27
137	0.032	0.054	0.0259	0.06	0.36	0.37	0.09	1.08	1.09	1.48	0.21	1.26
141	0.014	0.018	0.0260	0.40	0.28	0.49	0.68	0.75	1.01	1.03	0.21	0.35
145	0.031	0.048	0.0220	0.46	0.43	0.56	0.80	1.14	1.27	1.58	0.21	0.44
149	0.028	0.040	0.0231	0.39	0.40	0.54	0.66	1.10	1.25	1.45	0.21	0.52
153	0.030	0.044	0.0239	0.30	0.41	0.51	0.50	1.14	1.24	1.44	0.21	0.66
157	0.020	0.027	0.0218	0.55	0.37	0.66	0.92	0.96	1.33	1.44	0.21	0.38
161	0.045	0.082	0.0185	0.44	0.55	0.69	0.74	1.41	1.58	2.34	0.21	0.75
165	0.045	0.077	0.0213	0.30	0.50	0.55	0.49	1.40	1.44	1.96	0.21	0.91
169	0.041	0.070	0.0215	0.34	0.48	0.54	0.58	1.32	1.37	1.87	0.21	0.74
173	0.037	0.063	0.0204	0.37	0.47	0.60	0.62	1.26	1.40	1.91	0.21	0.71

time	ub	Ab	fcws	u*cs	u*ws	u*cws	u*c	u*w	u*cw	dcw	z0	z0c
177	0.032	0.050	0.0175	0.83	0.53	0.93	1.41	1.27	1.78	2.22	0.21	0.34
181	0.040	0.074	0.0147	1.03	0.64	1.20	1.65	1.34	2.11	3.12	0.14	0.28
185	0.024	0.035	0.0257	0.29	0.35	0.44	0.48	0.98	1.07	1.24	0.21	0.55
189	0.041	0.069	0.0208	0.31	0.49	0.58	0.51	1.33	1.42	1.93	0.21	0.86
193	0.027	0.039	0.0200	0.61	0.44	0.74	1.04	1.13	1.50	1.74	0.21	0.40
197	0.027	0.039	0.0274	0.21	0.35	0.39	0.35	1.04	1.07	1.24	0.21	0.70
201	0.046	0.067	0.0231	0.19	0.52	0.54	0.30	1.49	1.51	1.75	0.21	1.16
205	0.053	0.083	0.0170	0.71	0.70	0.99	1.21	1.73	2.10	2.63	0.21	0.61
209	0.147	0.272	0.0144	0.32	1.25	1.25	0.48	2.82	2.83	4.17	0.14	2.36
213	0.219	0.404	0.0269	0.45	1.75	1.76	0.77	4.79	4.80	7.09	0.35	4.37
217	0.315	0.711	0.0332	0.59	2.32	2.34	1.03	5.79	5.81	10.51	0.32	5.66
221	0.232	0.472	0.0269	0.15	1.80	1.81	0.23	4.92	4.92	8.01	0.36	6.96
225	0.177	0.360	0.0131	0.37	1.44	1.46	0.57	3.21	3.22	5.25	0.15	2.81
229	0.148	0.273	0.0136	0.85	1.33	1.45	1.40	2.94	3.07	4.54	0.15	0.97
233	0.128	0.236	0.0145	0.43	1.16	1.23	0.65	2.58	2.66	3.93	0.14	1.75
237	0.109	0.222	0.0149	0.58	0.99	1.05	0.93	2.20	2.25	3.67	0.13	0.94
241	0.077	0.142	0.0166	0.41	0.79	0.88	0.67	2.01	2.12	3.12	0.21	1.32
245	0.057	0.097	0.0200	0.36	0.60	0.63	0.62	1.64	1.67	2.27	0.21	0.94
249	0.051	0.086	0.0184	0.47	0.61	0.76	0.79	1.57	1.75	2.38	0.21	0.80
253	0.052	0.096	0.0185	0.36	0.59	0.69	0.60	1.54	1.65	2.44	0.21	1.00
257	0.042	0.072	0.0186	0.51	0.55	0.74	0.86	1.41	1.64	2.24	0.21	0.64
261	0.029	0.041	0.0210	0.53	0.44	0.67	0.90	1.15	1.42	1.64	0.21	0.44
265	0.038	0.059	0.0197	0.58	0.52	0.71	1.00	1.34	1.54	1.93	0.21	0.46
269	0.025	0.037	0.0205	0.56	0.42	0.70	0.95	1.09	1.44	1.67	0.21	0.43
273	0.030	0.047	0.0219	0.38	0.42	0.57	0.63	1.13	1.30	1.62	0.21	0.60
277	0.053	0.108	0.0197	0.12	0.53	0.55	0.17	1.47	1.48	2.41	0.21	1.82
281	0.034	0.058	0.0182	0.65	0.50	0.78	1.12	1.26	1.58	2.16	0.21	0.41
285	0.023	0.033	0.0284	0.24	0.31	0.36	0.40	0.92	0.96	1.11	0.21	0.55
289	0.034	0.053	0.0180	0.71	0.53	0.87	1.20	1.31	1.76	2.19	0.21	0.44
293	0.040	0.062	0.0162	0.93	0.63	1.11	1.48	1.35	1.98	2.47	0.14	0.28
297	0.033	0.051	0.0200	0.52	0.48	0.69	0.88	1.23	1.48	1.85	0.21	0.51
301	0.036	0.056	0.0249	0.12	0.42	0.43	0.17	1.23	1.24	1.54	0.21	1.17
305	0.029	0.042	0.0256	0.34	0.38	0.44	0.58	1.09	1.13	1.31	0.21	0.51
309	0.034	0.052	0.0195	0.54	0.49	0.73	0.91	1.26	1.56	1.94	0.21	0.52
313	0.039	0.066	0.0157	0.94	0.62	1.10	1.51	1.30	1.94	2.65	0.14	0.27
317	0.038	0.059	0.0162	0.95	0.61	1.11	1.52	1.30	1.95	2.44	0.14	0.26
321	0.032	0.050	0.0213	0.49	0.44	0.60	0.84	1.17	1.33	1.66	0.21	0.45
325	0.040	0.068	0.0192	0.49	0.52	0.69	0.82	1.34	1.54	2.10	0.21	0.61
329	0.020	0.025	0.0256	0.38	0.34	0.50	0.64	0.92	1.11	1.13	0.21	0.43
333	0.054	0.078	0.0224	0.11	0.58	0.58	0.15	1.66	1.66	1.92	0.21	1.57
337	0.144	0.246	0.0140	0.62	1.33	1.47	0.98	2.97	3.12	4.26	0.15	1.50
341	0.251	0.464	0.0368	1.15	2.08	2.26	2.20	5.57	5.80	8.57	0.39	2.65
345	0.319	0.588	0.0403	0.93	2.50	2.66	1.51	5.42	5.62	8.29	0.18	2.97
349	0.634	1.434	0.0416	0.76	4.22	4.24	1.28	9.17	9.20	16.64	0.25	9.26

time	ub	Ab	fcws	u*cs	u*ws	u*cws	u*c	u*w	u*cw	dcw	z0	z0c
353	0.727	1.643	0.0427	0.17	4.73	4.73	0.27	10.62	10.62	19.20	0.30	17.25
357	0.506	1.143	0.0392	0.24	3.46	3.46	0.35	7.09	7.09	12.82	0.17	10.35
361	0.546	1.234	0.0400	0.19	3.69	3.70	0.28	7.73	7.73	13.97	0.19	11.94
365	0.505	1.140	0.0393	0.69	3.46	3.48	1.08	7.10	7.12	12.87	0.17	6.70
369	0.444	1.004	0.0400	1.21	3.24	3.46	1.97	6.56	6.84	12.37	0.17	3.60
373	0.407	0.920	0.0366	0.15	2.87	2.87	0.21	5.67	5.67	10.25	0.13	8.71
377	0.352	0.716	0.0369	0.30	2.57	2.58	0.45	5.67	5.67	9.25	0.19	6.82
381	0.354	0.722	0.0369	0.15	2.59	2.59	0.21	5.67	5.67	9.24	0.19	8.03
385	0.304	0.686	0.0321	0.05	2.23	2.23	0.07	5.90	5.90	10.66	0.38	10.25
389	0.287	0.585	0.0348	1.06	2.21	2.29	2.01	5.75	5.84	9.51	0.35	3.06
393	0.259	0.527	0.0413	1.79	2.33	2.93	2.96	4.69	5.54	9.03	0.16	1.06
397	0.251	0.512	0.0297	0.18	1.93	1.94	0.28	5.39	5.40	8.79	0.41	7.51
401	0.190	0.350	0.0133	0.07	1.55	1.55	0.09	3.49	3.49	5.15	0.16	4.70
405	0.186	0.379	0.0128	0.36	1.51	1.54	0.54	3.36	3.39	5.52	0.16	3.13
409	0.124	0.229	0.0151	0.25	1.10	1.11	0.36	2.47	2.48	3.67	0.14	2.28
413	0.094	0.146	0.0169	0.66	0.93	1.00	1.15	2.40	2.46	3.06	0.21	0.87
417	0.127	0.217	0.0277	1.10	1.33	1.73	2.02	3.46	4.00	5.45	0.32	1.30
421	0.089	0.165	0.0165	0.49	0.86	0.90	0.85	2.20	2.25	3.32	0.21	1.17
425	0.072	0.122	0.0178	0.41	0.74	0.82	0.69	1.95	2.02	2.75	0.21	1.14
429	0.061	0.095	0.0202	0.38	0.64	0.67	0.64	1.77	1.79	2.23	0.21	0.96
433	0.096	0.177	0.0151	0.67	0.97	1.13	1.08	2.12	2.30	3.40	0.14	0.76
437	0.087	0.161	0.0149	0.94	0.93	1.16	1.54	2.01	2.25	3.32	0.14	0.38
441	0.084	0.156	0.0138	0.98	0.99	1.39	1.59	2.11	2.65	3.91	0.15	0.55
445	0.067	0.114	0.0171	0.75	0.74	0.89	1.34	1.87	1.99	2.71	0.21	0.48
449	0.034	0.045	0.0249	0.34	0.43	0.50	0.58	1.23	1.29	1.40	0.21	0.59
453	0.093	0.144	0.0144	1.16	1.08	1.49	1.91	2.36	2.86	3.57	0.16	0.45
457	0.138	0.235	0.0139	0.97	1.31	1.50	1.60	2.90	3.11	4.24	0.16	0.77
461	0.113	0.176	0.0168	1.06	1.22	1.57	1.69	2.56	3.00	3.74	0.13	0.57
465	0.111	0.188	0.0137	1.28	1.19	1.55	2.14	2.57	2.97	4.05	0.16	0.39
469	0.121	0.224	0.0140	1.00	1.17	1.36	1.66	2.56	2.76	4.08	0.15	0.56
473	0.105	0.179	0.0159	0.58	1.00	1.07	0.93	2.25	2.32	3.16	0.14	0.90
477	0.083	0.141	0.0171	0.44	0.83	0.90	0.73	2.15	2.22	3.03	0.21	1.26
481	0.053	0.083	0.0217	0.11	0.56	0.57	0.16	1.60	1.61	2.00	0.21	1.59
485	0.040	0.058	0.0188	0.74	0.57	0.85	1.28	1.44	1.74	2.02	0.21	0.38
489	0.065	0.133	0.0180	0.17	0.64	0.66	0.26	1.71	1.73	2.82	0.21	1.90
493	0.044	0.075	0.0177	0.65	0.58	0.83	1.12	1.46	1.74	2.38	0.21	0.50
497	0.058	0.118	0.0149	0.77	0.72	1.05	1.23	1.53	1.94	3.16	0.13	0.43
501	0.061	0.124	0.0170	0.45	0.66	0.77	0.76	1.67	1.79	2.92	0.21	0.96
505	0.058	0.132	0.0181	0.29	0.57	0.59	0.48	1.53	1.54	2.79	0.21	1.24
509	0.052	0.106	0.0161	0.61	0.64	0.86	1.04	1.56	1.84	3.00	0.21	0.67
513	0.060	0.135	0.0165	0.40	0.63	0.74	0.66	1.60	1.72	3.10	0.21	1.09
517	0.052	0.118	0.0153	0.70	0.64	0.89	1.20	1.52	1.83	3.32	0.21	0.54
521	0.036	0.061	0.0166	0.78	0.56	0.97	1.34	1.36	1.90	2.59	0.21	0.44
525	0.050	0.101	0.0159	0.63	0.63	0.89	1.08	1.52	1.86	3.04	0.21	0.64

time	ub	Ab	fcws	u*cs	u*ws	u*cws	u*c	u*w	u*cw	dcw	z0	z0c
529	0.087	0.136	0.0178	0.25	0.86	0.89	0.38	2.27	2.30	2.87	0.21	1.86
533	0.194	0.330	0.0226	0.49	1.61	1.64	0.83	4.29	4.32	5.88	0.29	3.30
537	0.190	0.351	0.0174	0.38	1.56	1.58	0.61	4.00	4.02	5.94	0.26	3.70
541	0.229	0.467	0.0264	0.04	1.79	1.79	0.06	4.85	4.85	7.90	0.35	7.60
545	0.234	0.476	0.0289	0.71	1.84	1.89	1.31	5.06	5.11	8.33	0.39	3.80
549	0.166	0.306	0.0139	0.37	1.38	1.39	0.56	3.12	3.12	4.61	0.15	2.49
553	0.142	0.263	0.0145	0.22	1.22	1.23	0.32	2.76	2.77	4.09	0.14	2.76
557	0.107	0.182	0.0157	0.48	1.02	1.09	0.75	2.29	2.37	3.23	0.14	1.19
561	0.084	0.143	0.0179	0.09	0.80	0.80	0.12	2.14	2.14	2.92	0.21	2.52
565	0.067	0.105	0.0181	0.44	0.74	0.86	0.73	1.93	2.07	2.58	0.21	1.06
569	0.058	0.090	0.0206	0.19	0.61	0.64	0.28	1.71	1.73	2.16	0.21	1.47
573	0.054	0.085	0.0217	0.08	0.57	0.58	0.12	1.62	1.63	2.03	0.21	1.72
577	0.057	0.089	0.0205	0.42	0.61	0.65	0.73	1.68	1.71	2.13	0.21	0.79
581	0.045	0.065	0.0209	0.48	0.56	0.67	0.82	1.50	1.61	1.86	0.21	0.61
585	0.114	0.177	0.0167	0.15	1.04	1.04	0.20	2.40	2.40	3.00	0.13	2.31
589	0.182	0.336	0.0134	0.12	1.50	1.50	0.16	3.38	3.38	4.99	0.16	4.22
593	0.317	0.646	0.0352	0.46	2.36	2.37	0.76	5.83	5.84	9.51	0.29	6.05
597	0.348	0.709	0.0367	0.41	2.55	2.55	0.63	5.69	5.69	9.28	0.20	6.08
601	0.504	1.026	0.0416	0.19	3.49	3.49	0.28	7.26	7.26	11.83	0.17	10.06
605	0.380	0.775	0.0384	0.49	2.76	2.79	0.72	5.60	5.63	9.17	0.14	5.37
609	0.299	0.610	0.0340	0.12	2.24	2.24	0.18	5.93	5.93	9.66	0.36	8.74
613	0.199	0.367	0.0198	0.03	1.61	1.61	0.04	4.21	4.21	6.21	0.28	6.02
617	0.140	0.238	0.0150	0.13	1.22	1.22	0.17	2.78	2.78	3.79	0.14	3.10
621	0.088	0.150	0.0176	0.11	0.83	0.84	0.15	2.21	2.22	3.02	0.21	2.52
625	0.101	0.187	0.0163	0.15	0.92	0.92	0.22	2.39	2.40	3.54	0.21	2.72
629	0.046	0.072	0.0194	0.54	0.58	0.74	0.93	1.51	1.68	2.09	0.21	0.58
633	0.039	0.053	0.0257	0.12	0.46	0.47	0.17	1.35	1.36	1.47	0.21	1.15
637	0.045	0.066	0.0239	0.09	0.50	0.51	0.12	1.47	1.47	1.70	0.21	1.43
641	0.118	0.217	0.0155	0.16	1.04	1.05	0.23	2.36	2.36	3.49	0.13	2.54
645	0.127	0.258	0.0145	0.34	1.10	1.11	0.51	2.44	2.46	4.01	0.14	1.99
649	0.091	0.167	0.0162	0.45	0.88	0.94	0.76	2.24	2.30	3.40	0.21	1.35
653	0.058	0.098	0.0187	0.37	0.64	0.73	0.61	1.68	1.79	2.43	0.21	1.06
657	0.055	0.093	0.0201	0.26	0.58	0.62	0.43	1.60	1.63	2.23	0.21	1.20
661	0.053	0.097	0.0205	0.17	0.54	0.55	0.27	1.51	1.52	2.24	0.21	1.48
665	0.044	0.074	0.0222	0.27	0.48	0.50	0.44	1.36	1.38	1.88	0.21	0.92
669	0.064	0.109	0.0199	0.07	0.64	0.64	0.10	1.77	1.77	2.41	0.21	2.09
673	0.067	0.104	0.0201	0.13	0.68	0.68	0.19	1.88	1.88	2.35	0.21	1.84
677	0.085	0.132	0.0154	0.82	0.97	1.27	1.32	2.13	2.50	3.12	0.15	0.62
681	0.108	0.184	0.0157	0.64	1.03	1.10	1.04	2.31	2.38	3.24	0.14	0.81
685	0.086	0.134	0.0176	0.47	0.86	0.92	0.79	2.26	2.31	2.89	0.21	1.17
689	0.158	0.292	0.0139	0.44	1.34	1.37	0.67	3.02	3.05	4.50	0.15	2.12
693	0.136	0.250	0.0145	0.45	1.19	1.23	0.70	2.68	2.72	4.01	0.14	1.70
697	0.208	0.355	0.0325	1.24	1.78	1.90	2.46	4.94	5.06	6.89	0.39	1.71
701	0.749	1.525	0.0460	1.08	4.96	5.01	1.94	11.43	11.50	18.74	0.33	9.48

time	ub	Ab	fcws	u*cs	u*ws	u*cws	u*c	u*w	u*cw	dcw	z0	z0c
705	0.667	1.358	0.0459	1.62	4.58	4.77	2.93	10.36	10.63	17.33	0.30	5.67
709	0.651	1.472	0.0436	2.25	4.50	4.78	4.17	10.03	10.46	18.91	0.30	3.63
713	0.690	1.560	0.0429	1.74	4.58	4.67	3.19	10.23	10.35	18.72	0.29	5.18
717	0.542	1.105	0.0441	1.69	3.85	4.03	2.95	8.29	8.54	13.91	0.23	3.36
721	0.404	0.824	0.0420	2.08	3.06	3.30	3.48	6.14	6.43	10.49	0.16	1.08
725	0.324	0.659	0.0361	0.56	2.42	2.45	0.92	5.71	5.75	9.37	0.25	5.25
729	0.160	0.272	0.0140	0.69	1.40	1.46	1.12	3.15	3.21	4.37	0.15	1.35
733	0.135	0.250	0.0146	0.52	1.19	1.22	0.82	2.66	2.69	3.98	0.14	1.44
737	0.115	0.212	0.0144	0.69	1.11	1.25	1.11	2.43	2.60	3.84	0.14	0.94
741	0.058	0.091	0.0203	0.34	0.62	0.66	0.57	1.72	1.75	2.18	0.21	1.02
745	0.034	0.049	0.0204	0.60	0.49	0.71	1.04	1.27	1.50	1.74	0.21	0.40
749	0.043	0.066	0.0189	0.57	0.57	0.77	0.97	1.45	1.70	2.12	0.21	0.57
753	0.029	0.042	0.0168	1.08	0.54	1.10	1.71	1.13	1.79	2.08	0.14	0.16
757	0.019	0.026	0.0310	0.18	0.28	0.33	0.29	0.84	0.88	0.95	0.21	0.58
761	0.027	0.041	0.0195	0.65	0.44	0.73	1.12	1.09	1.43	1.78	0.21	0.33
765	0.027	0.042	0.0243	0.33	0.37	0.46	0.56	1.03	1.11	1.38	0.21	0.53
769	0.026	0.041	0.0199	0.56	0.43	0.69	0.95	1.09	1.42	1.78	0.21	0.43
773	0.020	0.029	0.0197	0.66	0.39	0.76	1.11	0.98	1.48	1.72	0.21	0.35
777	0.016	0.022	0.0153	1.42	0.45	1.48	2.28	0.96	2.44	2.64	0.16	0.19
781	0.017	0.021	0.0233	0.55	0.33	0.61	0.93	0.86	1.19	1.21	0.21	0.31
785	0.063	0.091	0.0202	0.35	0.68	0.73	0.58	1.86	1.90	2.20	0.21	1.07
789	0.362	0.617	0.0470	1.67	2.95	3.33	2.75	6.02	6.53	8.90	0.16	1.64
793	0.354	0.654	0.0477	2.42	3.05	3.78	4.17	6.36	7.40	10.93	0.20	1.15
797	0.336	0.620	0.0432	2.17	2.69	2.99	3.59	5.35	5.68	8.38	0.14	0.64
801	0.203	0.346	0.0331	0.78	1.77	1.93	1.44	4.93	5.13	6.99	0.40	3.13
805	0.206	0.381	0.0244	0.30	1.67	1.69	0.49	4.48	4.50	6.65	0.32	4.78
809	0.121	0.223	0.0141	0.68	1.16	1.34	1.08	2.55	2.76	4.08	0.15	1.11
813	0.112	0.191	0.0154	0.76	1.07	1.16	1.25	2.39	2.47	3.37	0.14	0.68

time	qEH	DirE	qEB	DirEB	qBG	DirB	qYL	DirYL
1	0.000000	0	0.000000	0	0.000000	0	0.000000	0
5	0.000000	0	0.000000	0	0.000000	0	0.000000	0
9	0.000000	0	0.000000	0	0.000000	0	0.000000	0
13	0.000000	0	0.000000	0	0.000000	0	0.000000	0
17	0.000000	0	0.000000	0	0.000000	0	0.000000	0
21	0.000000	0	0.000000	0	0.000000	0	0.000000	0
25	0.000000	0	0.000000	0	0.000000	0	0.000000	0
29	0.000000	0	0.000000	0	0.000000	0	0.000000	0
33	0.000094	305	0.000079	306	0.000076	304	0.000036	304
37	0.000000	0	0.000000	0	0.000000	0	0.000000	0
41	0.000009	151	0.000096	154	0.000058	140	0.000194	137
45	0.000000	339	0.000020	338	0.000002	339	0.000025	341
49	0.000003	149	0.000138	149	0.000037	142	0.000259	140
53	0.000012	159	0.000058	148	0.000068	167	0.000136	175
57	0.000385	319	0.000520	324	0.000639	304	0.001686	302
61	0.000000	0	0.000000	0	0.000000	0	0.000000	0
65	0.000000	0	0.000000	0	0.000000	0	0.000000	0
69	0.000000	0	0.000000	0	0.000000	0	0.000000	0
73	0.000049	135	0.000057	135	0.000057	132	0.000019	132
77	0.000798	206	0.000275	203	0.000245	185	0.000507	198
81	0.001300	291	0.000792	299	0.001172	276	0.002956	275
85	0.000000	0	0.000000	0	0.000000	0	0.000000	0
89	0.000000	0	0.000000	0	0.000000	0	0.000000	0
93	0.000000	0	0.000000	0	0.000000	0	0.000000	0
97	0.000000	0	0.000000	0	0.000000	0	0.000000	0
101	0.000000	0	0.000000	0	0.000000	0	0.000000	0
105	0.000000	0	0.000000	0	0.000000	0	0.000000	0
109	0.000000	0	0.000000	0	0.000000	0	0.000000	0
113	0.000000	0	0.000000	0	0.000000	0	0.000000	0
117	0.000000	0	0.000000	0	0.000000	0	0.000000	0
121	0.000000	0	0.000000	0	0.000000	0	0.000000	0
125	0.000000	0	0.000000	0	0.000000	0	0.000000	0
129	0.000081	257	0.000016	254	0.000086	263	0.000030	262
133	0.000000	0	0.000000	0	0.000000	0	0.000000	0
137	0.000000	0	0.000000	0	0.000000	0	0.000000	0
141	0.000000	0	0.000000	0	0.000000	0	0.000000	0
145	0.000000	0	0.000000	0	0.000000	0	0.000000	0
149	0.000000	0	0.000000	0	0.000000	0	0.000000	0
153	0.000000	0	0.000000	0	0.000000	0	0.000000	0
157	0.000000	0	0.000000	0	0.000000	0	0.000000	0
161	0.000000	0	0.000000	0	0.000000	0	0.000000	0
165	0.000000	0	0.000000	0	0.000000	0	0.000000	0
169	0.000000	0	0.000000	0	0.000000	0	0.000000	0
173	0.000000	0	0.000000	0	0.000000	0	0.000000	0

time	qEH	DirE	qEB	DirEB	qBG	DirB	qYL	DirYL
177	0.000000	0	0.000000	0	0.000000	0	0.000000	0
181	0.000170	275	0.000111	275	0.000113	288	0.000101	288
185	0.000000	0	0.000000	0	0.000000	0	0.000000	0
189	0.000000	0	0.000000	0	0.000000	0	0.000000	0
193	0.000000	0	0.000000	0	0.000000	0	0.000000	0
197	0.000000	0	0.000000	0	0.000000	0	0.000000	0
201	0.000000	0	0.000000	0	0.000000	0	0.000000	0
205	0.000000	0	0.000000	0	0.000000	0	0.000000	0
209	0.000000	0	0.000000	0	0.000000	0	0.000000	0
213	0.000002	334	0.000018	329	0.000023	342	0.000022	354
217	0.000011	159	0.000222	155	0.000131	167	0.000620	180
221	0.000000	168	0.000019	168	0.000006	172	0.000020	177
225	0.000001	168	0.000005	168	0.000011	181	0.000000	181
229	0.000027	327	0.000023	336	0.000056	309	0.000020	309
233	0.000001	342	0.000008	342	0.000014	345	0.000000	345
237	0.000000	0	0.000000	0	0.000000	0	0.000000	0
241	0.000000	0	0.000000	0	0.000000	0	0.000000	0
245	0.000000	0	0.000000	0	0.000000	0	0.000000	0
249	0.000000	0	0.000000	0	0.000000	0	0.000000	0
253	0.000000	0	0.000000	0	0.000000	0	0.000000	0
257	0.000000	0	0.000000	0	0.000000	0	0.000000	0
261	0.000000	0	0.000000	0	0.000000	0	0.000000	0
265	0.000000	0	0.000000	0	0.000000	0	0.000000	0
269	0.000000	0	0.000000	0	0.000000	0	0.000000	0
273	0.000000	0	0.000000	0	0.000000	0	0.000000	0
277	0.000000	0	0.000000	0	0.000000	0	0.000000	0
281	0.000000	0	0.000000	0	0.000000	0	0.000000	0
285	0.000000	0	0.000000	0	0.000000	0	0.000000	0
289	0.000000	0	0.000000	0	0.000000	0	0.000000	0
293	0.000080	252	0.000050	250	0.000072	267	0.000023	268
297	0.000000	0	0.000000	0	0.000000	0	0.000000	0
301	0.000000	0	0.000000	0	0.000000	0	0.000000	0
305	0.000000	0	0.000000	0	0.000000	0	0.000000	0
309	0.000000	0	0.000000	0	0.000000	0	0.000000	0
313	0.000076	166	0.000039	170	0.000072	148	0.000020	147
317	0.000074	224	0.000035	218	0.000072	243	0.000020	243
321	0.000000	0	0.000000	0	0.000000	0	0.000000	0
325	0.000000	0	0.000000	0	0.000000	0	0.000000	0
329	0.000000	0	0.000000	0	0.000000	0	0.000000	0
333	0.000000	0	0.000000	0	0.000000	0	0.000000	0
337	0.000022	132	0.000088	132	0.000048	129	0.000068	129
341	0.000228	300	0.000580	308	0.000678	288	0.001958	286
345	0.000224	317	0.002491	317	0.001674	312	0.005227	311
349	0.000046	135	0.005520	138	0.020617	129	0.009224	101

time	qEH	DirE	qEB	DirEB	qBG	DirB	qYL	DirYL
353	0.000001	126	0.007715	125	0.011901	126	0.007876	130
357	0.000001	117	0.001154	117	0.000436	114	0.002152	99
361	0.000001	112	0.001418	112	0.000576	110	0.002376	96
365	0.000024	292	0.001736	295	0.002114	285	0.003986	259
369	0.000790	293	0.013351	293	0.038614	291	0.020153	291
373	0.000000	294	0.000186	294	0.000055	296	0.000446	320
377	0.000001	286	0.000216	286	0.000072	292	0.000541	308
381	0.000000	290	0.000023	289	0.000026	292	0.000117	352
385	0.000000	102	0.000040	103	0.000004	102	0.000084	97
389	0.000079	268	0.000239	291	0.000385	269	0.001030	254
393	0.003337	279	0.010325	279	0.035374	275	0.017381	274
397	0.000000	100	0.000046	100	0.000010	96	0.000071	92
401	0.000000	0	0.000000	0	0.000000	0	0.000000	0
405	0.000002	279	0.000032	279	0.000014	288	0.000009	289
409	0.000000	0	0.000000	0	0.000000	0	0.000000	0
413	0.000000	0	0.000000	0	0.000000	0	0.000000	0
417	0.000305	259	0.000517	259	0.000366	265	0.001011	265
421	0.000000	0	0.000000	0	0.000000	0	0.000000	0
425	0.000000	0	0.000000	0	0.000000	0	0.000000	0
429	0.000000	0	0.000000	0	0.000000	0	0.000000	0
433	0.000000	0	0.000000	0	0.000000	0	0.000000	0
437	0.000022	211	0.000005	208	0.000052	213	0.000001	213
441	0.000160	259	0.000195	259	0.000143	257	0.000241	257
445	0.000000	0	0.000000	0	0.000000	0	0.000000	0
449	0.000000	0	0.000000	0	0.000000	0	0.000000	0
453	0.000190	184	0.000094	171	0.000221	196	0.000407	198
457	0.000058	183	0.000039	172	0.000095	198	0.000087	199
461	0.000187	176	0.000212	174	0.000216	192	0.000475	193
465	0.000517	246	0.000158	243	0.000255	216	0.000460	223
469	0.000046	328	0.000014	338	0.000079	323	0.000033	322
473	0.000000	0	0.000000	0	0.000000	0	0.000000	0
477	0.000000	0	0.000000	0	0.000000	0	0.000000	0
481	0.000000	0	0.000000	0	0.000000	0	0.000000	0
485	0.000000	0	0.000000	0	0.000000	0	0.000000	0
489	0.000000	0	0.000000	0	0.000000	0	0.000000	0
493	0.000000	0	0.000000	0	0.000000	0	0.000000	0
497	0.000018	90	0.000016	90	0.000039	77	0.000000	77
501	0.000000	0	0.000000	0	0.000000	0	0.000000	0
505	0.000000	0	0.000000	0	0.000000	0	0.000000	0
509	0.000000	0	0.000000	0	0.000000	0	0.000000	0
513	0.000000	0	0.000000	0	0.000000	0	0.000000	0
517	0.000000	0	0.000000	0	0.000000	0	0.000000	0
521	0.000000	0	0.000000	0	0.000000	0	0.000000	0
525	0.000000	0	0.000000	0	0.000000	0	0.000000	0

time	qEH	DirE	qEB	DirEB	qBG	DirB	qYL	DirYL
529	0.000000	0	0.000000	0	0.000000	0	0.000000	0
533	0.000006	127	0.000039	128	0.000025	114	0.000021	113
537	0.000003	139	0.000034	139	0.000016	128	0.000011	128
541	0.000000	141	0.000017	142	0.000002	141	0.000015	141
545	0.000017	129	0.000082	137	0.000077	119	0.000188	115
549	0.000000	0	0.000000	0	0.000000	0	0.000000	0
553	0.000000	0	0.000000	0	0.000000	0	0.000000	0
557	0.000000	0	0.000000	0	0.000000	0	0.000000	0
561	0.000000	0	0.000000	0	0.000000	0	0.000000	0
565	0.000000	0	0.000000	0	0.000000	0	0.000000	0
569	0.000000	0	0.000000	0	0.000000	0	0.000000	0
573	0.000000	0	0.000000	0	0.000000	0	0.000000	0
577	0.000000	0	0.000000	0	0.000000	0	0.000000	0
581	0.000000	0	0.000000	0	0.000000	0	0.000000	0
585	0.000000	0	0.000000	0	0.000000	0	0.000000	0
589	0.000000	134	0.000014	135	0.000003	133	0.000000	133
593	0.000002	320	0.000103	316	0.000078	326	0.000320	355
597	0.000001	143	0.000106	147	0.000094	139	0.000385	98
601	0.000000	347	0.000514	347	0.000315	344	0.001099	312
605	0.000014	1	0.000989	1	0.000326	354	0.002267	349
609	0.000000	12	0.000128	13	0.000013	12	0.000273	10
613	0.000000	0	0.000009	359	0.000001	0	0.000001	0
617	0.000000	0	0.000000	0	0.000000	0	0.000000	0
621	0.000000	0	0.000000	0	0.000000	0	0.000000	0
625	0.000000	0	0.000000	0	0.000000	0	0.000000	0
629	0.000000	0	0.000000	0	0.000000	0	0.000000	0
633	0.000000	0	0.000000	0	0.000000	0	0.000000	0
637	0.000000	0	0.000000	0	0.000000	0	0.000000	0
641	0.000000	0	0.000000	0	0.000000	0	0.000000	0
645	0.000000	0	0.000000	0	0.000000	0	0.000000	0
649	0.000000	0	0.000000	0	0.000000	0	0.000000	0
653	0.000000	0	0.000000	0	0.000000	0	0.000000	0
657	0.000000	0	0.000000	0	0.000000	0	0.000000	0
661	0.000000	0	0.000000	0	0.000000	0	0.000000	0
665	0.000000	0	0.000000	0	0.000000	0	0.000000	0
669	0.000000	0	0.000000	0	0.000000	0	0.000000	0
673	0.000000	0	0.000000	0	0.000000	0	0.000000	0
677	0.000058	293	0.000078	293	0.000068	299	0.000048	300
681	0.000000	0	0.000000	0	0.000000	0	0.000000	0
685	0.000000	0	0.000000	0	0.000000	0	0.000000	0
689	0.000000	0	0.000000	0	0.000000	0	0.000000	0
693	0.000000	0	0.000000	0	0.000000	0	0.000000	0
697	0.000170	76	0.000057	54	0.000264	36	0.000507	68
701	0.000326	20	0.028683	18	0.898970	28	0.030383	45

time	qEH	DirE	qEB	DirEB	qBG	DirB	qYL	DirYL
705	0.002124	17	0.049722	15	3.906508	27	0.053850	33
709	0.005473	32	0.042969	17	9.237099	37	0.061440	49
713	0.000996	36	0.014737	13	0.711812	32	0.029292	64
717	0.001528	29	0.014095	18	0.202149	36	0.026297	47
721	0.002412	125	0.002073	162	0.027163	156	0.014482	126
725	0.000018	184	0.000526	185	0.000194	176	0.001296	172
729	0.000011	2	0.000017	7	0.000034	344	0.000004	344
733	0.000000	0	0.000000	0	0.000000	0	0.000000	0
737	0.000010	182	0.000014	184	0.000032	164	0.000001	164
741	0.000000	0	0.000000	0	0.000000	0	0.000000	0
745	0.000000	0	0.000000	0	0.000000	0	0.000000	0
749	0.000000	0	0.000000	0	0.000000	0	0.000000	0
753	0.000187	295	0.000058	295	0.000064	314	0.000002	303
757	0.000000	0	0.000000	0	0.000000	0	0.000000	0
761	0.000000	0	0.000000	0	0.000000	0	0.000000	0
765	0.000000	0	0.000000	0	0.000000	0	0.000000	0
769	0.000000	0	0.000000	0	0.000000	0	0.000000	0
773	0.000000	0	0.000000	0	0.000000	0	0.000000	0
777	0.000846	298	0.000231	313	0.000403	289	0.001114	287
781	0.000000	0	0.000000	0	0.000000	0	0.000000	0
785	0.000000	0	0.000000	0	0.000000	0	0.000000	0
789	0.002308	349	0.011686	348	0.061941	0	0.021087	1
793	0.010553	39	0.029228	32	1.435599	50	0.049466	53
797	0.004569	116	0.002339	111	0.017014	73	0.016038	112
801	0.000089	192	0.000491	193	0.000220	191	0.000939	191
805	0.000002	189	0.000061	189	0.000015	195	0.000039	196
809	0.000023	189	0.000052	189	0.000043	196	0.000023	196
813	0.000000	0	0.000000	0	0.000000	0	0.000000	0

Appendix 9

Site 4 RALPH wave, current and sediment suspension data: Day, Hour, total time (hour), water depth (h, m), mean velocity at 50 cm above seabed (u_{50}, m/s), mean velocity at 100 cm above seabed (u_{100}, m/s), mean current direction of u_{100} (C_{dir}), significant wave height (H_s, m), wave period (T_p, s), wave propagation direction W_{dir}, transmission percentages at 33 cm and 68 cm above seabed (C_{33} and C_{68}).

Day	Hour	time	h	u50	u100	Cdir	Hs	Tp	Wdir	C33	C68
66	19	1	36.32	4.84	7.81	129	0.40	10.7	349	90.22	68.22
66	23	5	36.10	5.81	12.25	166	0.40	9.1	17	90.03	67.17
67	3	9	35.48	8.73	9.40	289	0.37	9.8	351	91.98	73.53
67	7	13	36.27	13.46	18.09	6	0.34	9.8	350	92.32	74.72
67	11	17	36.26	8.43	10.58	106	0.30	9.1	17	91.88	72.58
67	15	21	35.43	5.79	11.40	144	0.50	8.0	11	92.33	74.3
67	19	25	36.07	6.46	9.46	85	0.95	9.1	23	91.91	72.63
67	23	29	36.21	15.09	26.49	149	1.04	9.8	20	91.84	72.3
68	3	33	35.45	4.37	11.15	189	1.39	10.7	30	91.52	71.04
68	7	37	36.04	11.26	13.77	358	1.52	10.7	36	91.41	70.56
68	11	41	36.43	10.47	18.28	120	1.13	11.6	36	91.46	69.34
68	15	45	35.52	14.00	25.68	166	1.00	10.7	42	92.19	71.38
68	19	49	35.89	1.77	2.11	296	1.00	9.8	41	90.69	66.31
68	23	53	36.47	8.29	16.94	166	0.85	10.7	50	90.02	63.68
69	3	57	35.60	7.55	11.60	222	0.60	9.8	37	92	69.58
69	7	61	35.85	21.35	23.13	323	0.58	9.8	35	92.54	71.48
69	11	65	36.63	8.73	9.26	31	0.46	9.8	33	92.38	70.85
69	15	69	35.71	5.84	9.12	186	0.36	9.1	5	92.12	69.76
69	19	73	35.65	10.57	12.97	328	0.36	8.5	354	91.85	68.41
69	23	77	36.53	9.03	12.25	94	0.37	9.1	359	92.5	70.61
70	3	81	35.61	10.25	17.69	177	0.40	8.5	357	92.26	69.9
70	7	85	35.56	12.59	13.42	334	0.53	8.5	359	92.04	68.93
70	11	89	36.57	12.51	15.58	62	0.89	9.8	11	92.63	71.54
70	15	93	35.73	10.84	20.55	156	0.98	10.7	19	92.48	71.45
70	19	97	35.50	1.89	1.76	293	2.47	11.6	9	89.75	64.55
70	23	101	36.59	2.22	1.69	36	2.98	12.8	15	87.85	60.5
71	3	105	35.91	5.17	9.63	217	2.18	14.2	5	91.78	66.35
71	7	109	35.57	15.72	23.19	295	1.73	12.8	9	93.2	68.66
71	11	113	36.69	10.60	13.68	320	1.54	12.8	356	90.51	60.33
71	15	117	36.09	7.15	14.66	199	1.75	12.8	78	89.13	56.17
71	19	121	35.53	8.02	9.56	290	1.32	9.1	143	93.98	68.57
71	23	125	36.68	10.51	15.12	354	1.11	11.6	225	91	58.73
72	3	129	36.18	5.52	13.87	159	1.13	10.7	232	74.49	28.1
72	7	133	35.53	6.18	6.82	316	0.67	10.7	329	90.88	58.82
72	11	137	36.55	14.30	19.61	8	0.47	11.6	294	92	59.84
72	15	141	36.21	11.02	19.58	141	0.52	9.8	318	92.63	62.29
72	19	145	35.51	2.39	3.64	92	0.42	9.8	327	85.29	51.94
72	23	149	36.51	8.29	10.15	59	0.34	11.6	332	77.06	36.73
73	3	153	36.35	10.40	20.44	156	0.34	10.7	343	82.14	38.32
73	7	157	35.51	2.93	2.87	303	0.31	10.7	310	84.54	52.53
73	11	161	36.37	11.97	16.19	6	0.30	8.5	353	91.97	58.98
73	15	165	36.34	12.77	22.16	141	0.32	9.8	336	92.31	60.64
73	19	169	35.52	5.41	8.30	207	0.37	9.1	321	95.41	69.97
73	23	173	36.35	9.05	12.12	351	0.40	9.1	351	91.03	56.69

Day	Hour	time	h	u50	u100	Cdir	Hs	Tp	Wdir	C33	C68
74	3	177	36.51	6.31	14.27	162	0.37	9.1	347	91.56	58.95
74	7	181	35.57	6.10	9.72	236	0.41	7.5	359	93.68	64.91
74	11	185	36.17	16.58	18.82	334	0.42	8.0	3	94.33	66.5
74	15	189	36.45	4.36	10.21	141	0.48	9.1	0	90.61	58.49
74	19	193	35.55	4.31	4.68	295	0.50	9.1	4	80.13	42.11
74	23	197	36.19	16.09	23.47	348	0.50	9.1	353	93.74	64.16
75	3	201	36.61	11.08	16.91	120	0.56	9.1	346	94.11	66.06
75	7	205	35.68	4.93	9.11	173	0.74	9.8	341	94.51	67.74
75	11	209	36.02	6.64	8.15	330	0.66	9.8	340	92.77	62.12
75	15	213	36.53	3.10	7.64	134	0.82	9.8	336	92.41	61.76
75	19	217	35.66	1.70	1.73	254	0.85	9.8	343	89.57	54.39
75	23	221	36.04	8.76	12.99	351	0.69	10.7	335	92.27	60.6
76	3	225	36.65	7.18	12.24	79	0.70	9.1	358	93.8	66.01
76	7	229	35.78	3.72	8.20	153	0.67	10.7	352	94.21	67
76	11	233	35.87	2.60	3.25	338	0.57	9.8	355	90.19	55.44
76	15	237	36.45	6.84	10.90	123	0.53	8.5	352	94.27	67.17
76	19	241	35.73	8.77	12.94	203	0.65	10.7	9	95.02	69.08
76	23	245	35.87	9.05	11.31	314	0.55	9.8	358	94.37	67.43
77	3	249	36.60	4.38	6.11	26	0.57	10.7	358	93.5	65.11
77	7	253	35.89	1.71	3.42	175	0.67	10.7	8	91.71	59.76
77	11	257	35.78	4.95	7.19	333	0.64	9.8	17	89.19	52.61
77	15	261	36.45	2.75	6.17	136	0.65	10.7	22	89.53	54.83
77	19	265	35.83	10.08	20.98	175	0.83	9.8	41	95.22	71.86
77	23	269	35.76	3.65	4.54	306	1.16	10.7	42	94.77	71.86
78	3	273	36.49	6.79	10.02	39	1.00	9.8	40	95	72.49
78	7	277	36.04	6.73	14.24	141	1.14	11.6	36	85.49	48.07
78	11	281	35.74	0.18	1.06	269	0.80	11.6	41	66.94	19.55
78	15	285	36.33	2.32	5.58	142	0.71	10.7	33	38.15	7.93
78	19	289	36.01	5.50	10.76	178	0.46	9.8	24	75.36	30.63
78	23	293	35.83	4.05	6.03	290	0.59	9.8	12	66.41	35.98
79	3	297	36.44	13.82	20.08	352	1.20	12.8	17	89.79	57.6
79	7	301	36.25	5.29	9.83	106	1.57	12.8	16	89.53	59.37
79	11	305	35.80	1.68	4.16	165	1.17	12.8	29	67.14	19.04
79	15	309	36.18	0.21	0.46	300	1.31	12.8	22	72.65	23.26
79	19	313	36.14	3.07	8.85	169	0.98	11.6	31	61.93	14.5
79	23	317	35.78	0.50	0.82	333	0.95	12.8	34	44.6	4.87
80	3	321	36.25	4.82	8.51	332	1.11	12.8	27	41.83	4.99
80	7	325	36.39	2.15	3.39	85	0.97	11.6	29	78.04	35.32
80	11	329	35.84	2.07	4.65	153	0.66	11.6	26	77.1	34.72
80	15	333	36.02	0.67	0.97	318	0.74	11.6	28	79.41	38.22
80	19	337	36.27	2.68	6.81	174	0.67	10.7	26	66.97	22.08
80	23	341	35.84	2.64	6.31	248	0.59	10.7	29	36.07	12.86
81	3	345	36.01	14.29	16.51	324	0.47	10.7	20	53.26	7.52
81	7	349	36.46	5.41	7.10	24	0.42	10.7	22	91.66	65.59

Day	Hour	time	h	u50	u100	Cdir	Hs	Tp	Wdir	C33	C68
81	11	353	35.95	2.58	6.90	152	0.42	9.8	7	68.85	41.45
81	15	357	35.82	4.34	6.58	341	0.41	10.7	348	71.94	40.63
81	19	361	36.37	2.84	6.31	166	0.40	9.8	343	66.67	36.64
81	23	365	36.02	6.76	9.38	214	0.34	12.8	323	94.64	72.27
82	3	369	35.82	17.53	18.86	324	0.32	10.7	329	95.05	74.36
82	7	373	36.54	12.03	18.34	13	0.40	11.6	313	95.79	77.8
82	11	377	36.20	5.42	8.16	90	0.58	8.5	316	96.15	79.45
82	15	381	35.72	7.02	8.44	334	0.98	8.5	327	96.01	79.97
82	19	385	36.45	9.02	12.31	348	1.77	9.8	336	95.59	82.79
82	23	389	36.25	0.97	0.96	162	1.37	10.7	338	94.83	78.94
83	3	393	35.65	9.90	12.92	302	1.52	11.6	13	95.81	81.18
83	7	397	36.45	18.46	24.49	353	1.50	10.7	7	95.82	82.08
83	11	401	36.42	5.14	9.38	112	1.52	11.6	341	94.94	78.93
83	15	405	35.58	1.33	0.78	153	1.60	11.6	333	94.82	79.53
83	19	409	36.27	1.58	1.91	67	0.96	9.8	330	94.51	75.94
83	23	413	36.44	7.18	16.74	167	0.88	10.7	334	95.36	78.04
84	3	417	35.51	12.60	18.85	236	0.89	11.6	312	95.44	78.36
84	7	421	36.20	15.37	21.27	348	0.51	9.8	327	96.18	81.02
84	11	425	36.63	8.34	12.18	117	0.57	10.7	305	95.23	77.9
84	15	429	35.52	10.86	15.50	193	0.46	9.8	305	94.92	75.78
84	19	433	36.05	9.83	12.79	331	0.44	9.8	310	96.33	80.82
84	23	437	36.63	5.75	10.30	140	0.40	9.8	330	95.06	77.12
85	3	441	35.56	11.11	16.09	208	0.43	10.7	347	95.38	76.77
85	7	445	35.84	14.69	20.35	335	0.51	9.8	8	95.76	78.01
85	11	449	36.69	9.69	14.37	82	1.13	10.7	16	96.1	80.16
85	15	453	35.58	6.65	15.13	181	1.77	11.6	18	94.66	76.88
85	19	457	35.64	9.88	14.48	325	1.66	11.6	22	94.01	76.47
85	23	461	36.83	5.15	9.40	108	1.59	11.6	28	93.98	77.62
86	3	465	35.70	8.75	20.85	178	1.42	11.6	27	95.13	78.13
86	7	469	35.52	12.02	16.89	327	0.98	10.7	26	95.27	77.58
86	11	473	36.83	6.08	8.73	60	0.86	11.6	26	94.36	74.94
86	15	477	35.86	9.56	19.35	172	0.71	10.7	15	85.97	76.44
86	19	481	35.43	11.14	13.62	325	0.61	10.7	21	2.5	73.66
86	23	485	36.93	13.09	15.44	46	0.51	9.8	22	95.33	77.24
87	3	489	36.05	13.57	24.22	159	0.49	10.7	10	95.65	77.87
87	7	493	35.27	10.96	12.57	290	0.43	9.1	18	95.72	78.46
87	11	497	36.75	14.30	21.01	13	0.42	9.1	9	95.85	78.37
87	15	501	36.03	12.47	21.33	154	0.45	8.0	3	95.11	75.61
87	19	505	35.17	5.52	7.24	284	0.59	8.5	357	95.12	76.25
87	23	509	36.69	8.09	13.10	5	1.07	9.8	28	95.19	75.6
88	3	513	36.36	11.60	23.02	157	1.10	10.7	28	95.39	76.81
88	7	517	35.21	8.04	12.83	248	1.10	10.7	25	96.11	79.34
88	11	521	36.41	15.80	21.53	347	1.08	10.7	43	96.28	79.79
88	15	525	36.34	6.41	15.10	166	0.83	10.7	35	95.12	75.59

Day	Hour	time	h	u50	u100	Cdir	Hs	Tp	Wdir	C33	C68
88	19	529	35.15	8.86	11.73	292	0.74	10.7	36	95.97	78.13
88	23	533	36.43	25.21	35.69	353	0.60	9.8	39	96.43	79.51
89	3	537	36.67	5.91	11.30	144	0.41	9.8	36	85.17	52.91
89	7	541	35.38	13.31	19.10	206	0.40	10.7	35	96.9	80.07
89	11	545	36.06	15.41	18.24	321	0.64	10.7	31	12.36	79.27
89	15	549	36.58	7.02	14.11	152	0.81	10.7	19	0.61	63.38
89	19	553	35.37	4.24	8.34	242	0.84	10.7	30	21.89	76.8
89	23	557	36.02	22.09	30.18	347	1.04	10.7	32	94.86	70.9
90	3	561	36.82	5.82	10.09	93	0.68	10.7	33	95.48	73.68
90	7	565	35.58	11.82	21.26	158	0.52	10.7	45	95.57	73.13
90	11	569	35.73	5.53	7.21	328	0.54	10.7	33	95.18	72.33
90	15	573	36.63	12.60	21.57	155	0.52	9.8	37	94.57	69.4
90	19	577	35.64	14.04	20.53	205	0.50	10.7	36	97.11	77.88
90	23	581	35.74	21.28	24.31	332	0.44	9.1	39	96.04	73.45
91	3	585	36.85	15.63	19.21	56	0.42	9.8	54	96.25	74.84
91	7	589	35.91	13.44	22.71	152	0.50	9.1	49	95.79	73.02
91	11	593	35.61	5.39	7.98	232	0.53	9.1	52	91.98	63.1
91	15	597	36.54	6.62	10.03	185	0.44	9.1	44	96.3	74.88
91	19	601	35.95	14.80	21.11	214	0.34	8.5	39	96.34	73.42
91	23	605	35.62	25.75	28.66	308	0.30	9.1	42	95.23	69.61
92	3	609	36.70	16.70	22.46	11	0.29	8.0	32	92.58	61.82
92	7	613	36.23	7.31	12.67	128	0.59	9.8	351	87.46	53.02
92	11	617	35.60	8.46	13.55	226	0.61	10.7	353	96.81	74.97
92	15	621	36.43	1.18	0.76	321	0.78	10.7	345	89.1	54.95
92	19	625	36.16	11.64	16.73	207	0.54	9.8	351	90.58	55.14
92	23	629	35.64	9.00	12.21	282	0.47	9.8	343	92.46	61.85
93	3	633	36.41	19.60	29.85	349	0.36	9.1	351	95.46	68.95
93	7	637	36.41	11.20	14.35	104	0.33	9.8	330	96.98	74.35
93	11	641	35.68	2.22	4.18	168	0.33	9.1	331	90.25	64.44
93	15	645	36.09	2.58	5.44	5	0.30	9.1	334	88.71	56.37
93	19	649	36.28	10.21	13.33	188	0.33	9.1	335	90.72	57.63
93	23	653	35.69	5.45	8.07	241	0.31	8.5	310	78.72	42.86
94	3	657	36.01	16.86	20.17	337	0.32	8.5	326	93.03	58.81
94	7	661	36.48	11.77	14.75	68	0.32	9.8	344	95.97	69.63
94	11	665	35.80	1.92	3.63	141	0.33	8.0	337	92.55	65.52
94	15	669	35.83	3.85	7.12	353	0.31	9.1	332	0.47	45.48
94	19	673	36.39	5.12	6.19	182	0.32	8.0	346	0.1	32.25
94	23	677	35.87	11.43	16.39	240	0.29	9.1	355	0.4	57.48
95	3	681	35.80	21.73	23.68	331	0.32	8.5	339	0.3	61.69
95	7	685	36.51	9.40	9.82	34	0.35	9.8	337	0.11	72.84
95	11	689	36.04	6.30	12.11	152	0.35	9.8	334	0.2	61.51
95	15	693	35.68	2.56	3.05	297	0.38	9.1	326	0.3	53.02
95	19	697	36.42	3.43	7.67	151	0.39	9.8	326	0.11	43.5
95	23	701	36.15	6.71	10.67	209	0.38	9.8	323	0.11	29.39

Day	Hour	time	h	u50	u100	Cdir	Hs	Tp	Wdir	C33	C68
96	3	705	35.64	10.48	12.02	324	0.37	9.8	318	0.21	64.34
96	7	709	36.41	10.87	12.51	22	0.35	9.1	342	0.2	70.73
96	11	713	36.21	8.24	13.49	135	0.37	9.1	331	0.2	70.72
96	15	717	35.58	4.91	6.86	206	0.33	8.5	346	0.11	70.66
96	19	721	36.32	2.48	3.73	103	0.33	8.5	345	0.3	65.41
96	23	725	36.29	10.88	16.33	186	0.32	9.1	339	0.2	66.87
97	3	729	35.56	10.20	15.81	258	0.33	8.5	318	0.11	66.07
97	7	733	36.24	16.26	21.63	347	0.31	9.1	324	0.11	72.89
97	11	737	36.37	4.65	6.98	131	0.32	9.8	339	0.2	68.68
97	15	741	35.59	6.19	9.68	219	0.31	9.1	9	0.4	69.27
97	19	745	36.10	4.88	6.59	351	0.31	10.7	330	0.11	63.58
97	23	749	36.46	5.73	9.97	178	0.31	8.5	350	0.2	65.69
98	3	753	35.59	9.99	15.71	260	0.32	8.5	339	0.11	70.6
98	7	757	35.97	16.83	22.18	344	0.34	8.5	350	0.3	74.36
98	11	761	36.47	5.69	6.20	107	0.35	8.5	29	0.11	75.49
98	15	765	35.56	6.20	12.30	160	0.46	9.1	59	0.2	75.31
98	19	769	35.85	7.98	10.71	286	0.58	9.1	53	0.21	76.12
98	23	773	36.59	4.19	7.12	138	0.64	9.8	47	0.11	76.05
99	3	777	35.68	2.78	4.70	188	0.57	9.8	49	0.11	71.37
99	7	781	35.79	12.79	16.75	338	0.57	9.8	38	0.2	76.36
99	11	785	36.61	6.27	11.53	144	0.41	9.8	40	0.2	49.56
99	15	789	35.71	11.43	18.06	184	0.36	9.8	16	0.21	70.98
99	19	793	35.76	9.68	10.78	314	0.36	8.5	16	0.3	61.82
99	23	797	36.70	5.24	4.74	39	0.35	9.1	29	0.11	71.36
100	3	801	35.84	4.94	7.47	191	0.31	10.7	27	0.11	68.45
100	7	805	35.62	10.52	11.44	327	0.29	8.5	1	0.11	61.96
100	11	809	36.60	6.50	6.48	48	0.29	10.7	339	0.11	76.82
100	15	813	35.84	7.56	14.09	174	0.29	10.7	337	0.11	63.33
100	19	817	35.59	10.00	12.31	337	0.28	9.1	340	0.11	51
100	23	821	36.65	9.80	10.08	47	0.32	8.0	3	0.11	76.25
101	3	825	35.93	14.16	22.72	148	0.56	9.1	7	0.11	71.24
101	7	829	35.42	2.64	5.53	147	0.94	9.1	34	0.11	61.86
101	11	833	36.41	5.42	10.01	121	1.19	10.7	23	0.11	20.11
101	15	837	35.91	11.76	24.04	181	1.25	10.7	22	0.11	74.68
101	19	841	35.44	10.21	13.80	302	1.34	11.6	28	0.11	71.83
101	23	845	36.53	14.35	18.52	1	0.88	10.7	33	0.11	58.66
102	3	849	36.08	5.84	13.51	143	1.14	11.6	36	0.11	53.42
102	7	853	35.39	1.54	5.85	234	0.91	10.7	43	0.11	74.55
102	11	857	36.35	1.98	3.17	314	0.63	9.8	46	0.11	66.71
102	15	861	36.09	11.25	21.92	180	0.55	9.8	58	0.11	74.23
102	19	865	35.49	11.81	13.86	292	0.45	9.1	55	0.11	72.62
102	23	869	36.49	20.69	26.62	350	0.37	9.1	70	0.11	65.57
103	3	873	36.31	6.35	8.40	111	0.32	9.8	53	0.11	58.13
103	7	877	35.45	5.10	10.90	153	0.29	7.5	60	0.11	37.52

Day	Hour	time	h	u50	u100	Cdir	Hs	Tp	Wdir	C33	C68
103	11	881	36.24	8.84	10.77	51	0.29	9.1	69	0.11	20.83
103	15	885	36.22	13.58	24.44	171	0.26	10.7	26	0.11	47.59
103	19	889	35.51	7.81	12.80	256	0.28	9.8	327	0.11	60.31
103	23	893	36.24	18.84	25.80	349	0.26	16.0	8	0.11	68.85
104	3	897	36.44	10.90	15.59	121	0.28	12.8	314	0.11	59.22
104	7	901	35.49	6.30	10.27	180	0.28	10.7	9	0.11	62.43
104	11	905	36.02	5.43	5.60	329	0.28	11.6	333	0.11	69.18
104	15	909	36.27	6.33	13.19	167	0.37	7.5	6	0.11	59.19
104	19	913	35.51	3.42	6.38	259	0.81	9.1	24	0.11	65.45
104	23	917	36.06	11.14	16.85	343	1.06	9.8	32	0.11	62.42
105	3	921	36.50	2.22	2.48	99	1.15	9.8	28	0.12	3.5
105	7	925	35.59	0.59	3.25	206	1.62	11.6	32	0.48	2.23
105	11	929	35.88	5.35	10.21	356	1.29	11.6	34	0.16	118.93
105	15	933	36.39	1.89	4.07	112	1.14	10.7	41	0.11	3.91
105	19	937	35.63	1.95	2.00	279	1.05	10.7	34	0.17	4.52
105	23	941	35.97	8.67	12.54	340	0.67	11.6	38	0.11	48.37
106	3	945	36.62	5.32	8.03	63	0.65	10.7	49	0.11	10.08
106	7	949	35.79	4.64	8.79	109	0.54	10.7	41	0.11	9.06
106	11	953	35.78	5.13	6.80	52	0.48	9.8	40	0.11	10.1
106	15	957	36.45	6.41	15.62	162	0.50	9.1	38	0.11	2.29
106	19	961	35.79	8.38	13.81	237	0.39	9.8	36	0.11	36.52
106	23	965	35.80	13.32	15.91	327	0.38	9.8	29	0.11	4.88
107	3	969	36.53	9.27	13.72	10	0.33	9.1	25	0.11	52.3
107	7	973	35.90	4.23	6.46	118	0.30	8.5	14	0.11	42.84
107	11	977	35.67	5.36	6.97	345	0.30	8.5	14	0.1	36.03
107	15	981	36.33	2.18	5.31	157	0.30	12.8	27	0.1	34.4
107	19	985	35.91	6.38	9.86	203	0.40	8.0	32	0.11	13.72
107	23	989	35.67	10.66	13.09	317	0.45	8.5	34	0.11	18.37
108	3	993	36.42	11.11	14.53	354	0.54	9.1	38	0.11	54.46
108	7	997	36.09	1.25	1.58	135	0.74	10.7	47	0.11	54.33
108	11	1001	35.62	2.69	4.56	348	0.71	10.7	40	0.1	51.3
108	15	1005	36.24	2.33	3.36	103	0.56	9.8	44	0.11	48.26
108	19	1009	36.10	4.43	9.59	177	0.52	10.7	29	0.11	16.5
108	23	1013	35.67	9.83	11.43	296	0.51	11.6	20	0.1	50.68
109	3	1017	36.31	16.96	22.11	344	0.42	11.6	9	0.1	54.62
109	7	1021	36.30	3.54	4.20	77	0.41	10.7	4	0.1	55.2
109	11	1025	35.68	3.63	3.86	65	0.42	11.6	5	0.1	52.51
109	15	1029	36.13	4.37	4.18	41	0.39	9.1	1	0.1	50.11
109	19	1033	36.28	5.79	12.24	167	0.32	11.6	355	0.1	48.22
109	23	1037	35.71	5.38	8.06	240	0.36	11.6	348	0.1	50.31
110	3	1041	36.09	15.47	19.87	341	0.31	9.1	355	0.1	48.98
110	7	1045	36.42	8.02	9.15	60	0.32	10.7	326	0.1	51.44
110	11	1049	35.72	3.43	8.70	146	0.30	10.7	330	0.1	48.51
110	15	1053	35.88	3.85	4.30	27	0.29	10.7	303	0.1	46.44

Day	Hour	time	h	u50	u100	Cdir	Hs	Tp	Wdir	C33	C68
110	19	1057	36.34	4.11	9.11	158	0.36	10.7	359	0.1	39.51
110	23	1061	35.81	4.12	6.47	201	0.43	8.5	38	0.1	46.51
111	3	1065	35.77	12.06	15.00	331	0.43	8.5	35	0.1	47.25
111	7	1069	36.42	4.13	5.67	52	0.43	8.5	46	0.1	42.48
111	11	1073	35.89	4.18	9.10	131	0.51	9.8	38	0.1	37.56
111	15	1077	35.61	1.89	3.74	346	0.49	9.8	44	0.1	29.29
111	19	1081	36.43	2.96	8.12	139	0.48	9.1	44	0.1	12.54
111	23	1085	36.03	4.68	10.57	159	0.47	9.8	51	0.1	33.52
112	3	1089	35.55	9.26	11.04	324	0.43	9.8	37	0.1	31.44
112	7	1093	36.43	4.44	7.61	14	0.39	9.1	39	0.1	32.84
112	11	1097	36.14	3.45	8.28	143	0.37	8.5	38	0.1	24.09
112	15	1101	35.45	4.32	8.00	348	0.37	8.0	25	0.1	17.27
112	19	1105	36.38	4.48	6.49	21	0.31	7.5	3	0.1	29.05
112	23	1109	36.32	4.88	9.08	163	0.31	12.8	351	0.1	21.51
113	3	1113	35.41	4.82	5.30	329	0.30	14.2	329	0.1	28.48
113	7	1117	36.25	12.75	18.00	359	0.28	12.8	275	0.11	32.11
113	11	1121	36.34	9.95	14.60	116	0.33	14.2	327	0.11	25.57
113	15	1125	35.32	10.15	16.83	188	0.34	14.2	328	0.1	15.97
113	19	1129	36.15	8.59	13.94	19	0.30	16.0	309	0.1	1.71
113	23	1133	36.57	10.17	17.53	134	0.34	12.8	303	0.1	9.75
114	3	1137	35.43	9.08	14.49	185	0.34	14.2	286	0.1	35.81
114	7	1141	35.92	12.27	15.74	340	0.37	12.8	317	0.1	35.21
114	11	1145	36.57	7.72	14.02	138	0.40	12.8	52	0.1	20.05
114	15	1149	35.39	15.18	22.85	188	0.41	7.5	81	0.1	37.53
114	19	1153	35.83	16.49	20.04	337	0.38	11.6	57	0.1	34.41
114	23	1157	36.81	8.02	10.87	83	0.44	8.5	52	0.1	23.57
115	3	1161	35.59	7.99	12.97	189	0.45	9.8	34	0.1	27.71
115	7	1165	35.61	13.83	16.58	333	0.45	9.8	48	0.1	17.98
115	11	1169	36.70	6.61	8.98	113	0.38	8.5	21	0.1	20.08
115	15	1173	35.60	13.87	21.56	183	0.39	8.5	29	0.1	26.92
115	19	1177	35.52	18.59	22.87	330	0.37	9.1	20	0.1	31.04
115	23	1181	36.92	9.93	12.75	25	0.35	11.6	17	0.1	29.92
116	3	1185	35.87	10.60	18.55	155	0.34	9.8	31	0.1	31.19
116	7	1189	35.26	8.28	12.52	277	0.34	9.8	342	0.1	18.66
116	11	1193	36.67	5.46	8.19	92	0.31	8.5	16	0.1	20.91
116	15	1197	35.91	15.76	23.12	186	0.30	9.8	16	0.1	21.7
116	19	1201	35.28	20.48	22.02	314	0.30	8.5	10	0.1	29.66
116	23	1205	36.84	21.97	31.07	7	0.31	14.2	334	0.1	43.33
117	3	1209	36.26	8.15	14.13	139	0.33	16.0	334	0.1	40.4
117	7	1213	35.18	3.07	5.76	243	0.36	16.0	295	0.1	36.87
117	11	1217	36.48	8.35	10.75	59	0.31	12.8	230	0.1	33.01
117	15	1221	36.20	13.18	22.69	175	0.34	14.2	251	0.11	29.19
117	19	1225	35.22	13.77	16.46	295	0.36	14.2	278	0.1	28.37
117	23	1229	36.53	28.77	40.76	3	0.39	8.5	2	0.1	41.05

Day	Hour	time	h	u50	u100	Cdir	Hs	Tp	Wdir	C33	C68
118	3	1233	36.54	11.94	18.69	122	0.48	8.5	346	0.1	41.15
118	7	1237	35.23	8.30	17.62	171	0.43	8.0	359	0.1	39.43
118	11	1241	36.07	3.52	4.89	8	0.48	8.5	11	0.1	23.24
118	15	1245	36.39	14.51	27.78	177	0.61	9.1	7	0.11	39.14
118	19	1249	35.30	16.76	24.30	265	0.65	9.1	14	0.1	28
118	23	1253	36.13	33.06	42.22	341	0.59	9.1	16	0.11	48.54
119	3	1257	36.72	7.83	11.22	90	0.49	9.1	25	0.1	54.88
119	7	1261	35.47	3.76	7.37	179	0.45	8.5	25	0.11	51.59
119	11	1265	35.79	8.74	12.21	353	0.43	8.5	25	0.1	50.1

Appendix 10

The results of Site 4 seabed image analyses. The listed parameters are time (hour), film-frame number (fm#), bed type (bed), current- and wave-ripple orientations (C_r, W_r), current ripple length and height (L_{rc}, H_{rc} in cm), wave ripple length and height (L_{rw}, H_{rw} in cm), ripple migration rate (M_r, cm/minute), ripple migration direction (M_{dir}) and bedform transport rate (q_r, 10^{-3} kg m^{-1} s^{-1}). See text for bed type definitions.

time	fm#	bed	Cr	Wr	Lrc	Hrc	Lrw	Hrw	Mr	Mdir	qr	Notes
1	182	NM										
5	191	NM										
9	208	NM										
13	217	NM										
17	226	NM										
21	235	W		113			9.90	1.29				
25	244	Wc		126			19.98	2.60				
29	253	Wc		126			17.72	2.30	0.0977	208	0.3371	
33	271	W		128			9.90	1.29	0.2517	203	0.4870	
37	280	Wc		118			13.55	1.76	0.2369	28	0.6254	
41	289	Wc		105			14.42	1.87				
45	298	Wc		126			10.77	1.40	0.1678	233	0.3523	
49	307	Wc		143			12.51	1.63	0.0888	233	0.2166	
53	316	W		140			11.72	1.52				
57	335	WC	83	133	7.12	0.77	25.00	3.25	0.0503	8	0.0581	Wr Mr = 0
61	344	NM										
65	353	NM										
69	362	NM										
73	371	NM										
77	380	NM										
81	390	NM										
85	399	Wc		113			10.60	1.38	0.0592	23	0.1226	
89	408	Wc		114			13.03	1.69				Wr oscillation
93	417	Wc/SS		108			12.68	1.65	0.2566	203	0.6351	
97	426	UPB										
101	435	UPB										
105	446	W/SS		79			10.60	1.23				reversing Wr
109	455	W/SS										
113	464	W/SS										
117	473	W										
121	482	Wc/SS		116			14.85	1.93				
125	491	Wc		133			13.81	1.80	0.1974	38	0.5315	
129	503	DM										
133	512	Wc	138	98	6.00	0.62	14.98	1.95	0.0545	15	0.2419	
137	521	Wc	170	116	5.47	0.56	17.46	2.27	0.0863	59	0.3534	
141	530	NM										
145	539	NM										
149	548	DM										
153	561	NM										
157	570	NM										
161	579	Wc		98			11.50	1.49	0.0651	8	0.1455	
165	588	NM										
169	597	NM										
173	606	NM										

time	fm#	bed	Cr	Wr	Lrc	Hrc	Lrw	Hrw	Mr	Mdir	qr	Notes
177	620	NM										
181	629	Wc		108			13.37	1.74				
185	638	NM										
189	647	NM										
193	656	DM										
197	665	WC	105		17.20	2.18			0.0691	38	0.2264	
201	680	WC	113		15.63	1.95			0.0666	180	0.1949	
205	689	NM										
209	698	W		93			18.24	2.37	0.0779	143	0.2768	
213	707	Wc	78				14.85	1.93				Mr not measured
217	716	Wc	78				15.11	1.96				Drilling mud
221	725	NM										
225	741	W	141				16.94	2.20				
229	750	NM										
233	759	NM										
237	768	W		104			8.16	1.06				
241	777	W		109			9.73	1.26				
245	786	W		98			14.76	1.92				
249	803	Wc		100			15.11	1.96	0.0395	188	0.1163	
253	812	W		98			11.29	1.47				
257	821	W		103			10.60	1.38				
261	830	Wc		116			10.94	1.42				Wr oscillation
265	839	Wc		126			9.90	1.13				
269	848	W		125			9.38	1.22				
273	866	Wc	89	137	7.82	0.85	16.41	2.13	0.0838	178	0.1068	Wr Mr = 0
277	875	DM										
281	884	NM										
285	893	NM										
289	902	NM										
293	911	DM										
297	930	W		97			10.42	1.20	0.2961	8	0.5347	
301	939	W		118			18.76	2.44				
305	948	W		123			15.11	1.96				
309	957	DM										
313	966	DM										
317	975	DM										
321	985	W										
325	994	DM										
329	1003	DM										
333	1012	DM										
337	1021	DM										
341	1030	DM										
345	1041	DM										
349	1050	LWR		123			48.98	6.37				relict, no motion

time	fm#	bed	Cr	Wr	Lrc	Hrc	Lrw	Hrw	Mr	Mdir	qr	Notes
353	1059	LWR		123			48.98	6.37				relict, no motion
357	1068	LWR		123			48.98	6.37				relict, no motion
361	1077	LWR										relict, no motion
365	1086	LWR		125			47.94	6.23				relict, no motion
369	1098	LWR		125			47.94	6.23				relict, no motion
373	1107	LWR		122			53.15	6.91				relict, no motion
377	1116	W		83			9.90	1.13				
381	1125	W		78			12.51	1.50	0.1135	348	0.2724	
385	1134	W/SS		111			26.06	3.39				
389	1143	W/SS		99			23.45	3.05	0.1382	189	0.6318	
393	1156	Wc		93			14.24	1.85	0.3652	353	1.0133	
397	1165	LWR/SS		83			33.87	4.40				
401	1174	W/SS	123	71	7.82	0.85	23.97	3.12	0.2961	143	1.7637	?1173 not traced
405	1183	W/SS		77			15.98	2.08	0.0790	188	0.2460	
409	1192	Wc		81			20.84	2.71	0.0691	323	0.2808	
413	1201	Wc	153	68	6.30	0.66	23.45	3.05	0.0995	209	0.5651	
417	1215	WC		53			16.15	2.10	0.0888	323	0.2798	
421	1224	WC	163	33	6.69	0.71	15.90	2.07	0.0873	68	0.0930	Wr Mr = 0
425	1233	WC	142	83	5.38	0.55	12.77	1.66	0.0494	178	0.1205	Wr Mr = 0
429	1242	WC	138	70	9.38	1.06	13.29	1.73				
433	1251	NM										
437	1260	WC	143	78	7.64	0.83	11.99	1.56	0.0296	233	0.0369	Wr Mr = 0
441	1275	WC										weak bedload
445	1284	Wc	140	83	8.86	0.99	17.89	2.33	0.0938	55	0.1393	Wr Mr = 0
449	1293	W/SS		125			11.81	1.54				Wr oscillation
453	1302	W/SS		103			15.63	2.03				
457	1311	W		124			15.98	2.08	0.2000	53	0.6235	
461	1320	Wc/SS		113			20.60	2.67	0.4046	173	1.6204	
465	1336	LWR		138			34.91	4.54				Wr oscillation
469	1345	W		111			18.80	2.44	0.1007	21	0.3684	
473	1354	Wc		108			14.94	1.94	0.0493	323	0.1437	
477	1363	Wc		107			9.38	1.22	0.0888	198	0.1625	
481	1372	Wc		113			10.94	1.42	0.0395	188	0.0842	
485	1381	Wc		117			11.81	1.54	0.0493	210	0.1137	
489	1398	Wc		103			12.16	1.58	0.0790	188	0.1872	
493	1407	Wc		98			14.42	1.87				Wr oscillation
497	1416	C	112		13.38	1.62			0.0395	53	0.0959	
501	1425	W		114			18.24	2.37				
505	1434	Wc		101			14.24	1.85	0.0493	8	0.1371	
509	1443	Wc/SS		109			15.29	1.99				
513	1461	Wc		121			17.98	2.34	0.1974	188	0.6929	Wr oscillation
517	1470	Wc		111			18.23	2.37	0.2270	233	0.8073	
521	1479	Wc		122			27.36	3.56				Wr oscillation
525	1488	Wc	88	140	7.30	0.79	14.94	1.94	0.1282	188	0.1519	Wr Mr = 0

time	fm#	bed	Cr	Wr	Lrc	Hrc	Lrw	Hrw	Mr	Mdir	qr	Notes
529	1497	Wc		103			15.11	1.96	0.0936	13	0.2751	Wr oscillation
533	1506	C	113		13.28	1.61			0.2369	18	0.5720	fits #1497
537	1525	DM										
541	1534	WC		118			13.54	1.76				Weak bedload
545	1543	Wc		118			13.28	1.73				Weak bedload
549	1552	W		113			11.60	1.51	0.0553	203	0.1252	
553	1561	WC		118			14.59	1.90	0.0740	353	0.2110	
557	1570	Cw	112		15.98	2.00			0.3849	8	1.1547	fits #1561
561	1580	WC		123			13.20	1.72				Wr oscillation
565	1589	Wc		131			15.63	2.03	0.1184	143	0.3610	
569	1598	Wc		133					0.0296	233		
573	1607	WC		123			9.90	1.29	0.0512	193	0.0991	
577	1616	Cw	128		8.69	0.97			0.0651	218	0.0948	
581	1625	Cw	123		12.68	1.52			0.0493	53	0.1125	
585	1636	Cw	113		17.70	2.26						Weak bedload
589	1645	NM										
593	1654	NM										
597	1663	C	128		8.20	0.91			0.0376	218	0.0513	
601	1672	C	128		11.29	1.32			0.0317	233	0.0627	
605	1681	C	113		8.51	0.95			0.0335	20	0.0477	
609	1693	NM										
613	1702	DM										
617	1711	W		86			12.51	1.63				
621	1720	DM										
625	1729	NM										
629	1738	DM										
633	1751	C	93		11.81	1.40			0.1283	8	0.2689	fits #1738
637	1760	NM										
641	1769	NM										
645	1778	NM										
649	1787	NM										
653	1796	NM										
657	1810	NM										
661	1819	NM										
665	1828	NM										
669	1837	NM										
673	1846	NM										
677	1855	C										Weak bedload
681	1870	NM										
685	1879	NM										
689	1888	NM										
693	1897	NM										
697	1906	NM										
701	1915	NM										

time	fm#	bed	Cr	Wr	Lrc	Hrc	Lrw	Hrw	Mr	Mdir	qr	Notes
705	1931	NM										
709	1940	NM										
713	1949	NM										
717	1958	NM										
721	1967	NM										
725	1976	NM										
729	1993	C	93		13.03	1.57						weak bedload
733	2002	NM										
737	2011	NM										
741	2020	NM										
745	2029	NM										
749	2038	NM										
753	2056	C	93		15.11	1.87			0.0592	13	0.1661	
757	2065	NM										
761	2074	NM										
765	2083	NM										
769	2092	NM										
773	2101	NM										
777	2120	Wc		136			13.72	1.78				Wr oscillation
781	2129	NM										
785	2138	DM										
789	2147	NM										
793	2156	NM										
797	2165	NM										
801	2174	NM										
805	2182	NM										
809	2190	NM										
813	2198	NM										
817	2206	NM										
821	2214	C	140		10.94	1.28			0.0172	163	0.0490	wr modified by cr
825	2224	Wc		139			14.59	1.90				wr oscillation
829	2232	Wc		122			13.20	1.72				wr oscillation
833	2240	DM										
837	2248	Wc/SS	343	115	8.33	0.92	11.63	1.51	0.0945	258	0.1304	Wr Mr = 0
841	2256	WC	134	102	8.34	0.92	21.63	2.81				wr oscillation
845	2264	Wc		123			14.59	1.90	0.1174	23	0.3345	
849	2275	W										wr oscillation
853	2283	W		137			17.46	2.27	0.0459	255	0.1562	
857	2291	WC		130			10.07	1.31	0.0374	213	0.0736	
861	2299	NM										
865	2307	Cw										
869	2315	NM										
873	2327	NM										
877	2335	NM										

time	fm#	bed	Cr	Wr	Lrc	Hrc	Lrw	Hrw	Mr	Mdir	qr	Notes
881	2343	DM										
885	2351	NM										
889	2359	DM										
893	2367	WC		113			11.99	1.56	0.0298	353	0.0697	fits #2359
897	2380	NM										
901	2388	NM										
905	2396	NM										
909	2404	DM										
913	2412	Wc		113			15.11	1.96	0.0425	23	0.1248	
917	2420	W		121			21.63	2.81				wr oscillation
921	2434	DM										
925	2442	DM										
929	2450	DM										
933	2458	DM										
937	2466	DM										
941	2474	W		126			22.58	2.94				
945	2489	NM										
949	2497	NM										
953	2505	DM										
957	2513	DM										
961	2521	NM										
965	2529	NM										
969	2545	NM										
973	2553	NM										
977	2561	NM										
981	2569	NM										
985	2577	NM										
989	2585	DM										
993	2602	NM										
997	2610	W		138			16.33	2.12				
1001	2618	NM										
1005	2626	W										
1009	2634	NM										
1013	2642	Wc	103	123	7.03	0.75	14.59	1.90	0.0270	13	0.0769	Wr Mr = 0
1017	2660	WC	174	113	6.25	0.66	10.42	1.35	0.0619	0	0.1152	
1021	2668	NM										
1025	2676	NM										
1029	2684	NM										
1033	2692	NM										
1037	2700	Cw										weak bedload
1041	2709	NM										
1045	2717	NM										
1049	2725	NM										
1053	2733	NM										

time	fm#	bed	Cr	Wr	Lrc	Hrc	Lrw	Hrw	Mr	Mdir	qr	Notes
1057	2741	NM										
1061	2749	NM										
1065	2759	NM										
1069	2767	NM										
1073	2775	NM										
1077	2783	NM										
1081	2791	NM										
1085	2799	NM										
1089	2810	NM										
1093	2818	NM										
1097	2826	NM										
1101	2834	NM										
1105	2842	NM										
1109	2850	NM										
1113	2862	NM										
1117	2870	NM										
1121	2878	DM										
1125	2886	NM										
1129	2894	DM										
1133	2902	NM										
1137	2915	WC										weak bedload
1141	2923	NM										
1145	2931	DM										
1149	2939	NM										
1153	2947	NM										
1157	2955	DM										
1161	2969	NM										
1165	2977	NM										
1169	2985	DM										
1173	2993	C	123		8.86	0.99			0.0287	213	0.0426	fits #2985
1177	3001	WC		127			15.63	2.03	0.0430	37	0.1309	
1181	3009	C										
1185	3024	NM										
1189	3032	NM										
1193	3040	DM										
1197	3048	NM										
1201	3056	C	88		9.21	1.04			0.0536	358	0.0839	
1205	3064	Cw	111		11.55	1.36			0.0331	13	0.0675	
1209	3080	NM										
1213	3088	NM										
1217	3096	C	113		9.12	1.03			0.0235	203	0.0363	
1221	3104	DM										
1225	3112	DM										
1229	3120	C	123		12.25	1.46			0.2149	33	0.4706	fits #3112

time	fm#	bed	Cr	Wr	Lrc	Hrc	Lrw	Hrw	Mr	Mdir	qr	Notes
1233	3137	Cw										weak bedload
1237	3145	NM										
1241	3153	DM										
1245	3161	Cw	113		12.25	1.46			0.0658	223	0.1442	
1249	3169	DM										
1253	3177	NM										
1257	3195	NM										
1261	3203	NM										
1265	3211	NM										

Appendix 11

Site 4 output data of the GSC continental shelf sediment transport model SEDTRANS92: (A) bottom boundary layer parameters and (B) sediment transport rates and directions. Listed parameters are defined the same as in Appendix 4.

time	ub	Ab	fcws	u*cs	u*ws	u*cws	u*c	u*w	u*cw	dcw	z0	z0c
1	0.060	0.103	0.0171	0.40	0.64	0.74	0.68	1.77	1.87	2.55	0.221	1.04
5	0.045	0.065	0.0178	0.55	0.57	0.78	0.97	1.56	1.81	2.09	0.221	0.63
9	0.049	0.077	0.0186	0.44	0.56	0.66	0.77	1.58	1.68	2.10	0.221	0.75
13	0.044	0.069	0.0156	0.78	0.62	1.00	1.23	1.32	1.80	2.24	0.110	0.28
17	0.034	0.049	0.0216	0.43	0.42	0.51	0.79	1.23	1.28	1.49	0.221	0.46
21	0.041	0.052	0.0197	0.51	0.54	0.71	0.89	1.51	1.70	1.73	0.221	0.59
25	0.107	0.155	0.0155	0.52	1.01	1.08	0.81	2.28	2.35	2.72	0.114	0.92
29	0.135	0.211	0.0324	1.24	1.37	1.75	2.32	3.63	4.13	5.15	0.301	1.04
33	0.214	0.364	0.0330	0.71	1.76	1.89	1.31	5.01	5.16	7.04	0.378	3.35
37	0.230	0.392	0.0354	0.85	1.88	2.03	1.53	4.96	5.15	7.02	0.301	2.75
41	0.186	0.343	0.0244	0.94	1.52	1.61	1.76	3.98	4.06	5.99	0.264	1.55
45	0.153	0.260	0.0318	1.22	1.46	1.79	2.33	3.86	4.30	5.86	0.314	1.21
49	0.131	0.205	0.0148	0.16	1.13	1.14	0.23	2.57	2.57	3.21	0.116	2.40
53	0.126	0.215	0.0134	0.84	1.18	1.34	1.36	2.56	2.75	3.75	0.125	0.69
57	0.080	0.125	0.0154	0.59	0.85	1.04	0.92	1.86	2.08	2.59	0.112	0.65
61	0.076	0.119	0.0146	0.98	0.88	1.18	1.58	1.87	2.21	2.76	0.118	0.29
65	0.059	0.092	0.0170	0.46	0.66	0.81	0.79	1.81	1.98	2.47	0.221	0.94
69	0.041	0.059	0.0190	0.43	0.52	0.67	0.74	1.45	1.63	1.89	0.221	0.71
73	0.035	0.047	0.0187	0.57	0.50	0.75	0.99	1.37	1.67	1.81	0.221	0.52
77	0.041	0.059	0.0199	0.51	0.50	0.61	0.92	1.41	1.49	1.73	0.221	0.49
81	0.039	0.053	0.0168	0.76	0.59	0.96	1.33	1.53	2.03	2.19	0.221	0.49
85	0.052	0.070	0.0174	0.61	0.65	0.88	1.07	1.76	2.04	2.21	0.221	0.66
89	0.114	0.178	0.0140	0.78	1.11	1.30	1.26	2.45	2.66	3.32	0.123	0.70
93	0.149	0.254	0.0288	1.04	1.40	1.69	1.91	3.67	4.04	5.51	0.285	1.36
97	0.418	0.771	0.0402	0.19	2.93	2.93	0.27	5.92	5.92	8.75	0.122	7.21
101	0.538	1.096	0.0407	0.21	3.60	3.60	0.30	7.68	7.69	12.53	0.179	10.60
105	0.432	0.976	0.0371	0.79	3.00	3.08	1.24	5.99	6.10	11.02	0.134	4.49
109	0.320	0.652	0.0367	1.32	2.40	2.54	2.19	4.94	5.12	8.34	0.138	1.44
113	0.278	0.565	0.0348	0.89	2.14	2.29	1.52	4.89	5.08	8.28	0.202	2.73
117	0.319	0.650	0.0361	0.97	2.37	2.48	1.57	4.98	5.11	8.33	0.146	2.40
121	0.152	0.220	0.0138	0.58	1.36	1.46	0.90	3.05	3.16	3.66	0.130	1.42
125	0.181	0.334	0.0275	0.85	1.54	1.70	1.56	4.07	4.26	6.29	0.292	2.05
129	0.170	0.289	0.0200	0.76	1.43	1.51	1.35	3.66	3.75	5.11	0.227	1.66
133	0.103	0.176	0.0148	0.41	0.96	1.04	0.62	2.12	2.21	3.01	0.112	1.20
137	0.077	0.142	0.0142	0.85	0.83	1.06	1.37	1.76	2.01	2.96	0.113	0.32
141	0.067	0.105	0.0144	0.89	0.83	1.22	1.42	1.78	2.27	2.84	0.120	0.40
145	0.057	0.088	0.0194	0.21	0.58	0.60	0.34	1.71	1.73	2.15	0.221	1.38
149	0.056	0.103	0.0176	0.46	0.58	0.63	0.83	1.61	1.65	2.44	0.221	0.73
153	0.052	0.088	0.0143	0.89	0.70	1.13	1.41	1.47	2.04	2.78	0.116	0.31
157	0.048	0.082	0.0197	0.17	0.50	0.53	0.27	1.49	1.51	2.06	0.221	1.39
161	0.028	0.038	0.0180	0.68	0.47	0.82	1.18	1.24	1.71	1.85	0.221	0.42
165	0.041	0.064	0.0149	0.93	0.63	1.12	1.48	1.33	1.98	2.47	0.116	0.25
169	0.042	0.061	0.0204	0.38	0.50	0.58	0.67	1.45	1.52	1.76	0.221	0.71
173	0.045	0.065	0.0176	0.55	0.58	0.80	0.96	1.57	1.84	2.14	0.221	0.65

time	ub	Ab	fcws	u*cs	u*ws	u*cws	u*c	u*w	u*cw	dcw	z0	z0c
177	0.041	0.060	0.0172	0.63	0.57	0.85	1.10	1.51	1.87	2.17	0.221	0.56
181	0.026	0.031	0.0233	0.41	0.38	0.53	0.72	1.12	1.27	1.21	0.221	0.46
185	0.033	0.041	0.0174	0.78	0.53	0.94	1.37	1.39	1.93	1.96	0.221	0.41
189	0.054	0.078	0.0179	0.49	0.63	0.77	0.84	1.73	1.89	2.19	0.221	0.79
193	0.058	0.084	0.0197	0.26	0.60	0.62	0.43	1.78	1.80	2.08	0.221	1.23
197	0.056	0.082	0.0145	1.02	0.78	1.28	1.63	1.67	2.33	2.70	0.122	0.31
201	0.062	0.089	0.0159	0.75	0.75	1.02	1.20	1.62	1.94	2.25	0.111	0.35
205	0.098	0.153	0.0151	0.50	0.96	1.08	0.78	2.12	2.26	2.82	0.114	0.93
209	0.087	0.136	0.0157	0.45	0.87	0.98	0.69	1.92	2.04	2.55	0.110	0.88
213	0.106	0.165	0.0150	0.45	1.00	1.09	0.68	2.22	2.32	2.89	0.114	1.12
217	0.113	0.177	0.0156	0.13	1.00	1.00	0.18	2.27	2.27	2.83	0.111	2.19
221	0.105	0.178	0.0138	0.68	1.04	1.23	1.07	2.24	2.48	3.38	0.120	0.80
225	0.077	0.112	0.0171	0.57	0.78	0.86	1.03	2.19	2.25	2.60	0.221	0.84
229	0.102	0.173	0.0147	0.47	0.96	1.06	0.72	2.11	2.23	3.03	0.113	1.05
233	0.076	0.118	0.0175	0.21	0.73	0.76	0.32	2.09	2.12	2.64	0.221	1.81
237	0.049	0.066	0.0188	0.50	0.59	0.74	0.88	1.66	1.82	1.97	0.221	0.69
241	0.099	0.169	0.0140	0.67	1.00	1.20	1.06	2.15	2.39	3.26	0.119	0.75
245	0.073	0.114	0.0161	0.56	0.78	0.93	0.97	2.09	2.26	2.82	0.221	0.94
249	0.084	0.143	0.0159	0.35	0.81	0.87	0.59	2.2	2.27	3.10	0.221	1.56
253	0.102	0.173	0.0154	0.23	0.92	0.95	0.36	2.51	2.53	3.45	0.221	2.33
257	0.085	0.133	0.0162	0.40	0.83	0.90	0.67	2.29	2.36	2.95	0.221	1.41
261	0.097	0.166	0.0155	0.36	0.89	0.92	0.61	2.43	2.46	3.36	0.221	1.72
265	0.111	0.172	0.0134	0.99	1.15	1.46	1.61	2.49	2.86	3.57	0.130	0.55
269	0.176	0.300	0.0131	0.33	1.43	1.43	0.49	3.19	3.20	4.36	0.129	2.53
273	0.129	0.202	0.0139	0.58	1.20	1.33	0.90	2.65	2.80	3.49	0.124	1.19
277	0.189	0.349	0.0249	0.80	1.54	1.62	1.46	4.06	4.14	6.12	0.270	2.04
281	0.135	0.249	0.0139	0.09	1.13	1.13	0.12	2.5	2.50	3.70	0.116	3.12
285	0.107	0.182	0.0152	0.34	0.95	0.98	0.52	2.13	2.15	2.93	0.110	1.33
289	0.060	0.094	0.0167	0.52	0.68	0.85	0.90	1.84	2.04	2.54	0.221	0.86
293	0.078	0.121	0.0175	0.33	0.74	0.76	0.56	2.12	2.13	2.66	0.221	1.38
297	0.218	0.444	0.0339	1.12	1.84	2.14	2.06	4.56	4.97	8.10	0.281	2.02
301	0.286	0.583	0.0324	0.69	2.10	2.10	1.20	5.21	5.21	8.49	0.253	3.78
305	0.215	0.438	0.0254	0.33	1.66	1.68	0.55	4.39	4.42	7.20	0.291	4.83
309	0.238	0.485	0.0278	0.05	1.79	1.79	0.07	4.87	4.87	7.94	0.326	7.58
313	0.164	0.302	0.0126	0.55	1.38	1.46	0.87	3.01	3.10	4.58	0.130	1.69
317	0.176	0.358	0.0124	0.08	1.38	1.38	0.10	3.03	3.03	4.94	0.127	4.35
321	0.203	0.413	0.0250	0.57	1.60	1.66	1.00	4.21	4.28	6.97	0.284	3.30
325	0.160	0.294	0.0131	0.26	1.30	1.32	0.38	2.88	2.90	4.28	0.124	2.70
329	0.111	0.205	0.0145	0.30	0.97	1.00	0.45	2.15	2.18	3.22	0.111	1.61
333	0.123	0.227	0.0143	0.08	1.04	1.04	0.11	2.31	2.31	3.41	0.112	2.90
337	0.100	0.171	0.0150	0.40	0.93	1.01	0.61	2.06	2.14	2.91	0.111	1.15
341	0.090	0.153	0.0156	0.37	0.85	0.91	0.61	2.31	2.37	3.23	0.221	1.62
345	0.071	0.120	0.0149	0.74	0.79	1.02	1.19	1.69	1.95	2.66	0.111	0.39
349	0.062	0.106	0.0169	0.38	0.66	0.76	0.64	1.81	1.92	2.61	0.221	1.15

time	ub	Ab	fcws	u*cs	u*ws	u*cws	u*c	u*w	u*cw	dcw	z0	z0c
353	0.055	0.086	0.0183	0.36	0.60	0.69	0.60	1.7	1.79	2.23	0.221	1.03
357	0.062	0.106	0.0170	0.35	0.65	0.74	0.59	1.8	1.90	2.58	0.221	1.20
361	0.052	0.082	0.0185	0.33	0.58	0.67	0.55	1.64	1.73	2.16	0.221	1.05
365	0.062	0.126	0.0161	0.45	0.63	0.70	0.80	1.7	1.78	2.90	0.221	0.91
369	0.049	0.084	0.0147	0.82	0.67	1.06	1.30	1.4	1.91	2.61	0.113	0.31
373	0.065	0.120	0.0144	0.80	0.75	1.02	1.28	1.58	1.90	2.80	0.111	0.32
377	0.055	0.075	0.0191	0.40	0.62	0.71	0.69	1.78	1.87	2.02	0.221	0.89
381	0.095	0.128	0.0161	0.47	0.95	1.06	0.72	2.14	2.26	2.44	0.113	0.92
385	0.229	0.357	0.0373	0.78	1.90	2.05	1.38	5	5.19	6.47	0.288	2.83
389	0.205	0.349	0.0256	0.09	1.62	1.62	0.13	4.38	4.38	5.96	0.274	5.44
393	0.256	0.473	0.0337	0.82	1.98	2.05	1.48	5.13	5.20	7.69	0.285	3.02
397	0.223	0.379	0.0400	1.32	1.97	2.36	2.28	4.48	5.01	6.83	0.197	1.36
401	0.251	0.463	0.0334	0.65	1.95	2.02	1.14	5.12	5.20	7.68	0.299	3.76
405	0.271	0.500	0.0331	0.08	2.03	2.03	0.12	5.28	5.28	7.80	0.281	7.23
409	0.124	0.194	0.0151	0.15	1.08	1.08	0.20	2.45	2.45	3.06	0.114	2.33
413	0.131	0.224	0.0219	0.87	1.27	1.54	1.54	3.18	3.53	4.81	0.234	1.29
417	0.150	0.277	0.0126	0.93	1.31	1.45	1.53	2.85	2.99	4.42	0.129	0.73
421	0.066	0.103	0.0142	0.94	0.83	1.25	1.51	1.77	2.31	2.89	0.121	0.36
425	0.084	0.143	0.0146	0.62	0.88	1.07	0.97	1.9	2.13	2.90	0.114	0.66
429	0.062	0.096	0.0164	0.68	0.70	0.89	1.22	1.87	2.07	2.58	0.221	0.61
433	0.058	0.090	0.0163	0.60	0.68	0.90	1.05	1.81	2.08	2.60	0.221	0.75
437	0.051	0.080	0.0173	0.49	0.61	0.78	0.85	1.66	1.87	2.33	0.221	0.79
441	0.066	0.112	0.0149	0.73	0.76	1.02	1.16	1.62	1.94	2.64	0.112	0.40
445	0.067	0.104	0.0145	0.90	0.83	1.20	1.45	1.76	2.24	2.79	0.119	0.36
449	0.166	0.283	0.0215	0.79	1.43	1.53	1.40	3.66	3.78	5.15	0.236	1.65
453	0.298	0.550	0.0387	0.99	2.32	2.52	1.59	4.87	5.11	7.55	0.142	2.20
457	0.280	0.516	0.0363	0.92	2.16	2.27	1.57	4.99	5.13	7.58	0.199	2.49
461	0.259	0.478	0.0327	0.65	1.96	1.99	1.15	5.24	5.26	7.77	0.306	3.83
465	0.239	0.442	0.0373	1.18	2.01	2.30	2.06	4.64	5.04	7.44	0.212	1.74
469	0.151	0.257	0.0212	0.88	1.36	1.53	1.56	3.44	3.64	4.96	0.232	1.33
473	0.140	0.259	0.0131	0.53	1.22	1.32	0.82	2.66	2.77	4.09	0.124	1.44
477	0.107	0.183	0.0130	0.94	1.12	1.45	1.52	2.4	2.82	3.84	0.129	0.62
481	0.094	0.159	0.0146	0.67	0.93	1.08	1.07	2.02	2.19	2.99	0.114	0.61
485	0.065	0.101	0.0153	0.72	0.77	1.04	1.13	1.66	1.99	2.48	0.112	0.43
489	0.074	0.126	0.0133	1.07	0.91	1.38	1.72	1.92	2.53	3.45	0.126	0.36
493	0.050	0.073	0.0191	0.53	0.57	0.66	0.97	1.62	1.68	1.95	0.221	0.56
497	0.045	0.066	0.0153	0.90	0.67	1.12	1.43	1.42	2.01	2.33	0.116	0.28
501	0.035	0.045	0.0166	0.88	0.58	1.04	1.40	1.24	1.84	1.87	0.112	0.22
505	0.059	0.080	0.0197	0.36	0.62	0.67	0.62	1.83	1.87	2.02	0.221	0.97
509	0.137	0.213	0.0134	0.72	1.28	1.46	1.15	2.81	3.02	3.77	0.130	1.05
513	0.164	0.280	0.0321	1.15	1.52	1.81	2.17	4.07	4.46	6.07	0.322	1.45
517	0.171	0.292	0.0259	0.74	1.48	1.62	1.32	3.89	4.06	5.53	0.268	2.06
521	0.161	0.274	0.0298	1.08	1.47	1.73	2.02	3.9	4.22	5.75	0.297	1.40
525	0.125	0.212	0.0133	0.78	1.18	1.36	1.25	2.56	2.77	3.77	0.126	0.81

time	ub	Ab	fcws	u*cs	u*ws	u*cws	u*c	u*w	u*cw	dcw	z0	z0c
529	0.115	0.195	0.0144	0.61	1.04	1.11	0.97	2.29	2.36	3.21	0.115	0.81
533	0.078	0.121	0.0333	1.49	1.04	1.75	2.54	2.31	3.30	4.11	0.177	0.36
537	0.053	0.083	0.0181	0.51	0.60	0.71	0.90	1.66	1.76	2.20	0.221	0.68
541	0.061	0.104	0.0142	0.86	0.77	1.15	1.36	1.62	2.11	2.88	0.117	0.36
545	0.096	0.164	0.0142	0.83	0.97	1.16	1.35	2.09	2.30	3.13	0.117	0.45
549	0.119	0.203	0.0136	0.73	1.13	1.30	1.17	2.46	2.65	3.62	0.123	0.81
553	0.130	0.221	0.0138	0.50	1.16	1.25	0.77	2.56	2.66	3.62	0.121	1.34
557	0.157	0.267	0.0365	1.42	1.55	2.02	2.75	4.14	4.81	6.55	0.355	1.24
561	0.100	0.171	0.0149	0.54	0.94	1.03	0.84	2.08	2.17	2.96	0.112	0.83
565	0.079	0.135	0.0142	0.92	0.88	1.16	1.49	1.87	2.19	2.99	0.117	0.33
569	0.082	0.140	0.0162	0.39	0.79	0.83	0.67	2.17	2.21	3.02	0.221	1.36
573	0.067	0.105	0.0148	0.92	0.81	1.14	1.48	1.72	2.11	2.63	0.116	0.29
577	0.077	0.131	0.0135	0.94	0.91	1.30	1.51	1.92	2.44	3.32	0.123	0.43
581	0.051	0.073	0.0153	0.99	0.71	1.12	1.58	1.49	1.98	2.30	0.116	0.21
585	0.054	0.084	0.0149	0.85	0.72	1.11	1.34	1.52	2.03	2.53	0.115	0.33
589	0.057	0.082	0.0157	0.93	0.73	1.05	1.48	1.55	1.90	2.20	0.113	0.22
593	0.061	0.089	0.0177	0.41	0.67	0.79	0.70	1.88	2.01	2.32	0.221	1.03
597	0.048	0.070	0.0184	0.47	0.58	0.73	0.82	1.61	1.78	2.06	0.221	0.74
601	0.033	0.044	0.0163	0.88	0.55	1.04	1.38	1.17	1.81	1.96	0.112	0.22
605	0.035	0.051	0.0152	1.10	0.59	1.14	1.75	1.22	1.87	2.16	0.116	0.14
609	0.022	0.028	0.0169	0.90	0.45	1.00	1.41	0.95	1.69	1.72	0.111	0.17
613	0.077	0.120	0.0156	0.62	0.82	0.99	0.97	1.79	1.99	2.48	0.110	0.54
617	0.094	0.160	0.0145	0.67	0.94	1.10	1.07	2.04	2.22	3.02	0.115	0.62
621	0.116	0.198	0.0150	0.06	1.01	1.01	0.08	2.26	2.26	3.08	0.111	2.72
625	0.071	0.111	0.0150	0.77	0.82	1.10	1.23	1.77	2.11	2.64	0.115	0.43
629	0.062	0.097	0.0168	0.56	0.69	0.83	1.00	1.87	2.02	2.52	0.221	0.76
633	0.040	0.058	0.0140	1.23	0.69	1.41	1.97	1.45	2.44	2.83	0.128	0.23
637	0.043	0.066	0.0170	0.62	0.56	0.81	1.10	1.49	1.79	2.23	0.221	0.54
641	0.038	0.055	0.0220	0.22	0.44	0.49	0.36	1.33	1.38	1.60	0.221	0.95
645	0.034	0.050	0.0220	0.27	0.42	0.49	0.45	1.25	1.32	1.53	0.221	0.79
649	0.037	0.053	0.0181	0.58	0.51	0.76	1.02	1.38	1.68	1.95	0.221	0.52
653	0.031	0.041	0.0229	0.35	0.40	0.48	0.62	1.18	1.26	1.36	0.221	0.55
657	0.031	0.042	0.0166	0.84	0.52	0.99	1.31	1.12	1.72	1.86	0.110	0.21
661	0.042	0.065	0.0182	0.60	0.52	0.69	1.08	1.42	1.56	1.95	0.221	0.43
665	0.026	0.033	0.0265	0.18	0.34	0.38	0.30	1.07	1.10	1.13	0.221	0.73
669	0.036	0.051	0.0207	0.34	0.45	0.56	0.58	1.3	1.42	1.64	0.221	0.72
673	0.025	0.031	0.0245	0.29	0.35	0.45	0.48	1.05	1.15	1.17	0.221	0.58
677	0.033	0.048	0.0180	0.67	0.49	0.77	1.18	1.3	1.61	1.86	0.221	0.39
681	0.031	0.042	0.0158	0.97	0.55	1.11	1.53	1.17	1.92	2.08	0.115	0.21
685	0.046	0.071	0.0186	0.45	0.54	0.66	0.79	1.51	1.64	2.04	0.221	0.70
689	0.046	0.072	0.0170	0.56	0.59	0.81	0.97	1.57	1.84	2.30	0.221	0.67
693	0.044	0.064	0.0216	0.17	0.48	0.51	0.28	1.47	1.49	1.73	0.221	1.18
697	0.051	0.080	0.0181	0.39	0.58	0.70	0.66	1.63	1.76	2.19	0.221	0.93
701	0.050	0.077	0.0183	0.48	0.57	0.68	0.86	1.59	1.70	2.13	0.221	0.68

time	ub	Ab	fcws	u*cs	u*ws	u*cws	u*c	u*w	u*cw	dcw	z0	z0c
705	0.049	0.077	0.0169	0.56	0.61	0.83	0.97	1.63	1.90	2.37	0.221	0.70
709	0.039	0.056	0.0183	0.55	0.52	0.74	0.96	1.43	1.68	1.94	0.221	0.56
713	0.041	0.060	0.0175	0.60	0.56	0.82	1.05	1.5	1.82	2.11	0.221	0.58
717	0.033	0.044	0.0223	0.32	0.42	0.51	0.55	1.24	1.34	1.45	0.221	0.67
721	0.031	0.042	0.0252	0.19	0.37	0.40	0.31	1.18	1.20	1.30	0.221	0.82
725	0.036	0.052	0.0171	0.70	0.54	0.87	1.22	1.4	1.83	2.12	0.221	0.47
729	0.032	0.044	0.0186	0.65	0.49	0.76	1.15	1.31	1.62	1.75	0.221	0.40
733	0.035	0.050	0.0157	0.90	0.57	1.05	1.42	1.2	1.84	2.13	0.113	0.22
737	0.042	0.065	0.0195	0.34	0.49	0.59	0.58	1.41	1.52	1.89	0.221	0.83
741	0.036	0.052	0.0196	0.44	0.47	0.63	0.76	1.33	1.51	1.75	0.221	0.62
745	0.047	0.081	0.0183	0.33	0.53	0.62	0.57	1.5	1.59	2.17	0.221	0.96
749	0.029	0.039	0.0205	0.44	0.42	0.61	0.76	1.19	1.41	1.53	0.221	0.54
753	0.031	0.042	0.0194	0.63	0.46	0.69	1.12	1.25	1.47	1.59	0.221	0.36
757	0.032	0.044	0.0160	0.92	0.56	1.07	1.45	1.18	1.87	2.02	0.114	0.22
761	0.033	0.045	0.0241	0.28	0.40	0.44	0.49	1.23	1.26	1.36	0.221	0.66
765	0.054	0.078	0.0185	0.54	0.61	0.71	0.97	1.71	1.80	2.08	0.221	0.62
769	0.067	0.096	0.0172	0.52	0.72	0.85	0.91	2	2.13	2.47	0.221	0.88
773	0.082	0.129	0.0172	0.38	0.78	0.79	0.66	2.21	2.22	2.77	0.221	1.31
777	0.076	0.119	0.0172	0.28	0.74	0.78	0.45	2.1	2.14	2.67	0.221	1.58
781	0.076	0.119	0.0153	0.76	0.84	1.05	1.22	1.81	2.06	2.57	0.113	0.40
785	0.052	0.082	0.0182	0.51	0.59	0.69	0.92	1.64	1.74	2.17	0.221	0.65
789	0.048	0.074	0.0154	0.79	0.65	1.02	1.25	1.39	1.86	2.32	0.111	0.30
793	0.035	0.047	0.0206	0.47	0.46	0.61	0.82	1.32	1.46	1.58	0.221	0.52
797	0.038	0.055	0.0216	0.25	0.45	0.51	0.40	1.34	1.40	1.62	0.221	0.91
801	0.048	0.081	0.0179	0.37	0.54	0.66	0.64	1.51	1.64	2.23	0.221	0.91
805	0.028	0.038	0.0202	0.49	0.42	0.63	0.86	1.17	1.42	1.54	0.221	0.48
809	0.043	0.073	0.0198	0.31	0.47	0.52	0.54	1.38	1.43	1.95	0.221	0.85
813	0.044	0.075	0.0161	0.63	0.58	0.85	1.10	1.5	1.85	2.52	0.221	0.59
817	0.032	0.047	0.0185	0.54	0.47	0.72	0.94	1.28	1.58	1.83	0.221	0.52
821	0.024	0.031	0.0222	0.43	0.37	0.55	0.75	1.07	1.26	1.28	0.221	0.45
825	0.064	0.092	0.0147	0.98	0.82	1.24	1.58	1.76	2.29	2.66	0.121	0.32
829	0.109	0.158	0.0159	0.34	1.00	1.02	0.51	2.27	2.30	2.66	0.112	1.31
833	0.177	0.301	0.0155	0.60	1.45	1.48	1.03	3.63	3.66	4.98	0.203	2.03
837	0.190	0.324	0.0376	1.25	1.74	2.13	2.31	4.42	4.96	6.75	0.287	1.55
841	0.228	0.421	0.0297	0.82	1.77	1.80	1.54	4.88	4.91	7.25	0.330	2.76
845	0.131	0.223	0.0228	0.94	1.27	1.55	1.67	3.2	3.56	4.85	0.239	1.18
849	0.191	0.352	0.0253	0.78	1.55	1.63	1.41	4.1	4.18	6.18	0.274	2.16
853	0.140	0.238	0.0137	0.39	1.21	1.27	0.58	2.68	2.74	3.74	0.122	1.80
857	0.081	0.127	0.0174	0.20	0.76	0.76	0.32	2.19	2.19	2.73	0.221	1.89
861	0.072	0.112	0.0145	0.95	0.85	1.19	1.53	1.82	2.22	2.78	0.119	0.32
865	0.052	0.075	0.0174	0.61	0.63	0.83	1.09	1.71	1.93	2.23	0.221	0.61
869	0.041	0.059	0.0154	1.04	0.63	1.10	1.65	1.31	1.86	2.16	0.115	0.16
873	0.041	0.064	0.0196	0.39	0.49	0.58	0.68	1.4	1.49	1.86	0.221	0.71
877	0.018	0.022	0.0250	0.43	0.31	0.46	0.76	0.88	1.00	0.95	0.221	0.31

time	ub	Ab	fcws	u*cs	u*ws	u*cws	u*c	u*w	u*cw	dcw	z0	z0c
881	0.033	0.048	0.0192	0.48	0.46	0.66	0.83	1.27	1.51	1.75	0.221	0.56
885	0.039	0.067	0.0142	1.01	0.62	1.16	1.60	1.28	2.00	2.73	0.117	0.22
889	0.038	0.059	0.0186	0.54	0.49	0.66	0.96	1.34	1.51	1.88	0.221	0.48
893	0.054	0.137	0.0116	1.09	0.73	1.31	1.76	1.46	2.27	4.62	0.124	0.28
897	0.050	0.102	0.0144	0.70	0.63	0.94	1.23	1.58	2.00	3.26	0.221	0.62
901	0.044	0.074	0.0172	0.48	0.54	0.72	0.83	1.46	1.68	2.28	0.221	0.72
905	0.047	0.086	0.0181	0.29	0.51	0.59	0.49	1.44	1.52	2.25	0.221	1.06
909	0.022	0.026	0.0208	0.55	0.39	0.67	0.96	1.07	1.42	1.36	0.221	0.40
913	0.093	0.135	0.0165	0.37	0.89	0.94	0.61	2.48	2.53	2.93	0.221	1.56
917	0.139	0.216	0.0201	0.87	1.30	1.50	1.53	3.29	3.53	4.41	0.221	1.21
921	0.148	0.231	0.0142	0.19	1.25	1.26	0.27	2.84	2.84	3.55	0.121	2.57
925	0.274	0.506	0.0338	0.29	2.06	2.08	0.46	5.22	5.24	7.74	0.261	5.77
929	0.216	0.399	0.0307	0.67	1.74	1.84	1.21	4.77	4.89	7.22	0.337	3.39
933	0.170	0.289	0.0132	0.30	1.39	1.40	0.44	3.1	3.11	4.24	0.127	2.57
937	0.160	0.273	0.0135	0.17	1.32	1.32	0.23	2.95	2.96	4.03	0.124	3.07
941	0.112	0.207	0.0137	0.65	1.04	1.16	1.04	2.25	2.38	3.52	0.117	0.80
945	0.096	0.163	0.0149	0.45	0.92	1.02	0.70	2.02	2.13	2.91	0.112	1.00
949	0.082	0.140	0.0160	0.46	0.79	0.85	0.79	2.17	2.23	3.04	0.221	1.20
953	0.064	0.100	0.0174	0.36	0.68	0.77	0.61	1.89	1.98	2.47	0.221	1.17
957	0.055	0.080	0.0168	0.69	0.67	0.90	1.22	1.8	2.06	2.38	0.221	0.59
961	0.052	0.081	0.0163	0.63	0.65	0.89	1.10	1.7	2.02	2.52	0.221	0.67
965	0.051	0.079	0.0166	0.68	0.63	0.86	1.22	1.66	1.92	2.40	0.221	0.53
969	0.037	0.053	0.0177	0.60	0.52	0.79	1.05	1.4	1.74	2.02	0.221	0.53
973	0.028	0.039	0.0248	0.29	0.36	0.41	0.50	1.12	1.15	1.25	0.221	0.59
977	0.029	0.040	0.0225	0.32	0.39	0.50	0.55	1.16	1.27	1.38	0.221	0.63
981	0.054	0.111	0.0172	0.29	0.55	0.60	0.48	1.54	1.59	2.60	0.221	1.23
985	0.032	0.041	0.0207	0.44	0.45	0.63	0.76	1.29	1.50	1.52	0.221	0.57
989	0.043	0.059	0.0195	0.55	0.54	0.69	0.99	1.52	1.65	1.78	0.221	0.51
993	0.060	0.087	0.0165	0.66	0.71	0.94	1.16	1.9	2.17	2.51	0.221	0.68
997	0.111	0.189	0.0152	0.12	0.97	0.97	0.17	2.17	2.17	2.96	0.109	2.30
1001	0.109	0.186	0.0150	0.30	0.97	1.00	0.44	2.17	2.20	2.99	0.111	1.55
1005	0.073	0.114	0.0179	0.21	0.70	0.72	0.33	2.03	2.05	2.55	0.221	1.72
1009	0.078	0.134	0.0155	0.50	0.80	0.93	0.86	2.14	2.28	3.11	0.221	1.15
1013	0.086	0.159	0.0154	0.55	0.81	0.87	0.99	2.19	2.23	3.30	0.221	0.99
1017	0.069	0.127	0.0132	0.98	0.85	1.28	1.57	1.77	2.34	3.45	0.122	0.36
1021	0.061	0.104	0.0184	0.24	0.60	0.62	0.39	1.75	1.76	2.40	0.221	1.41
1025	0.071	0.131	0.0169	0.23	0.67	0.70	0.38	1.9	1.92	2.83	0.221	1.71
1029	0.044	0.063	0.0213	0.23	0.49	0.53	0.37	1.46	1.50	1.74	0.221	1.05
1033	0.053	0.098	0.0155	0.57	0.63	0.85	1.00	1.64	1.92	2.84	0.221	0.75
1037	0.061	0.113	0.0171	0.40	0.62	0.67	0.70	1.72	1.78	2.62	0.221	0.99
1041	0.035	0.051	0.0160	0.83	0.56	1.00	1.31	1.19	1.76	2.04	0.111	0.23
1045	0.047	0.080	0.0191	0.41	0.51	0.57	0.74	1.47	1.50	2.05	0.221	0.69
1049	0.045	0.077	0.0177	0.42	0.54	0.68	0.72	1.47	1.64	2.23	0.221	0.81
1053	0.044	0.076	0.0207	0.22	0.46	0.48	0.38	1.4	1.41	1.92	0.221	1.07

time	ub	Ab	fcws	u*cs	u*ws	u*cws	u*c	u*w	u*cw	dcw	z0	z0c
1057	0.054	0.091	0.0170	0.45	0.61	0.75	0.77	1.65	1.81	2.47	0.221	0.88
1061	0.041	0.056	0.0208	0.32	0.50	0.59	0.54	1.46	1.56	1.68	0.221	0.83
1065	0.042	0.056	0.0184	0.63	0.56	0.78	1.12	1.51	1.75	1.89	0.221	0.48
1069	0.040	0.054	0.0214	0.29	0.48	0.56	0.48	1.42	1.49	1.62	0.221	0.86
1073	0.068	0.105	0.0180	0.44	0.67	0.71	0.78	1.93	1.95	2.43	0.221	0.93
1077	0.066	0.102	0.0184	0.22	0.65	0.67	0.36	1.89	1.91	2.38	0.221	1.52
1081	0.053	0.077	0.0200	0.38	0.57	0.60	0.68	1.67	1.69	1.96	0.221	0.82
1085	0.061	0.096	0.0176	0.49	0.65	0.75	0.88	1.83	1.91	2.39	0.221	0.80
1089	0.058	0.090	0.0178	0.50	0.63	0.73	0.90	1.75	1.85	2.30	0.221	0.74
1093	0.043	0.062	0.0196	0.37	0.52	0.63	0.63	1.48	1.60	1.86	0.221	0.80
1097	0.035	0.047	0.0225	0.36	0.43	0.50	0.64	1.28	1.34	1.45	0.221	0.59
1101	0.030	0.038	0.0225	0.36	0.41	0.53	0.62	1.21	1.34	1.36	0.221	0.58
1105	0.019	0.022	0.0265	0.29	0.30	0.41	0.49	0.89	1.01	0.96	0.221	0.48
1109	0.056	0.114	0.0156	0.45	0.61	0.76	0.78	1.63	1.80	2.94	0.221	0.96
1113	0.061	0.138	0.0157	0.30	0.60	0.67	0.50	1.63	1.71	3.09	0.221	1.43
1117	0.050	0.102	0.0151	0.73	0.60	0.82	1.31	1.52	1.74	2.84	0.221	0.41
1121	0.065	0.147	0.0136	0.68	0.72	0.97	1.07	1.49	1.81	3.27	0.109	0.44
1125	0.068	0.154	0.0132	0.77	0.76	1.05	1.22	1.57	1.93	3.48	0.112	0.40
1129	0.064	0.164	0.0138	0.62	0.66	0.83	1.12	1.67	1.86	3.78	0.221	0.68
1133	0.061	0.124	0.0136	0.79	0.73	1.08	1.26	1.52	1.97	3.21	0.114	0.38
1137	0.067	0.152	0.0145	0.64	0.69	0.82	1.15	1.77	1.90	3.44	0.221	0.65
1141	0.068	0.139	0.0137	0.73	0.77	1.05	1.16	1.61	1.96	3.20	0.113	0.44
1145	0.072	0.147	0.0152	0.62	0.71	0.81	1.13	1.89	1.96	3.20	0.221	0.69
1149	0.027	0.032	0.0179	0.89	0.49	0.94	1.56	1.25	1.80	1.72	0.221	0.29
1153	0.063	0.116	0.0148	0.83	0.72	0.96	1.33	1.51	1.76	2.60	0.109	0.24
1157	0.040	0.054	0.0192	0.49	0.53	0.71	0.86	1.47	1.68	1.81	0.221	0.62
1161	0.061	0.094	0.0161	0.61	0.71	0.92	1.07	1.88	2.14	2.67	0.221	0.77
1165	0.061	0.094	0.0164	0.71	0.70	0.89	1.28	1.85	2.04	2.55	0.221	0.55
1169	0.035	0.047	0.0229	0.38	0.43	0.48	0.69	1.28	1.31	1.42	0.221	0.54
1173	0.038	0.051	0.0161	0.90	0.60	1.07	1.42	1.28	1.89	2.04	0.113	0.23
1177	0.043	0.062	0.0155	0.94	0.64	1.09	1.50	1.35	1.92	2.22	0.114	0.22
1181	0.057	0.105	0.0152	0.60	0.66	0.89	1.05	1.72	2.01	2.97	0.221	0.77
1185	0.045	0.071	0.0160	0.78	0.62	0.94	1.38	1.59	1.98	2.47	0.221	0.46
1189	0.045	0.071	0.0180	0.55	0.55	0.71	0.97	1.52	1.68	2.10	0.221	0.57
1193	0.029	0.039	0.0236	0.35	0.38	0.46	0.62	1.13	1.19	1.29	0.221	0.51
1197	0.040	0.062	0.0147	0.97	0.63	1.15	1.54	1.31	2.02	2.52	0.117	0.24
1201	0.030	0.040	0.0167	0.88	0.52	0.98	1.39	1.09	1.66	1.80	0.110	0.17
1205	0.060	0.136	0.0183	1.30	0.83	1.52	2.08	1.65	2.61	4.71	0.123	0.26
1209	0.070	0.179	0.0128	0.68	0.75	1.01	1.07	1.54	1.86	3.79	0.111	0.50
1213	0.076	0.194	0.0144	0.33	0.69	0.74	0.56	1.83	1.89	3.84	0.221	1.64
1217	0.056	0.115	0.0152	0.52	0.63	0.82	0.90	1.65	1.88	3.06	0.221	0.86
1221	0.067	0.151	0.0131	0.94	0.76	1.08	1.50	1.56	1.92	3.48	0.114	0.24
1225	0.073	0.166	0.0129	0.77	0.81	1.11	1.23	1.67	2.06	3.73	0.115	0.47
1229	0.036	0.049	0.0377	1.63	0.72	1.78	2.76	1.61	3.19	3.46	0.180	0.27

time	ub	Ab	fcws	u*cs	u*ws	u*cws	u*c	u*w	u*cw	dcw	z0	z0c
1233	0.045	0.061	0.0167	0.79	0.63	0.98	1.25	1.36	1.78	1.93	0.110	0.26
1237	0.036	0.045	0.0175	0.75	0.56	0.93	1.31	1.46	1.96	2.00	0.221	0.46
1241	0.046	0.062	0.0210	0.26	0.52	0.58	0.43	1.55	1.61	1.74	0.221	1.01
1245	0.068	0.098	0.0218	1.20	0.92	1.51	1.93	1.92	2.72	3.15	0.123	0.32
1249	0.076	0.110	0.0148	1.02	0.89	1.23	1.66	1.92	2.29	2.66	0.120	0.28
1253	0.066	0.096	0.0406	1.73	1.01	1.97	3.04	2.34	3.75	4.34	0.217	0.38
1257	0.054	0.078	0.0182	0.51	0.62	0.74	0.91	1.73	1.85	2.15	0.221	0.71
1261	0.044	0.059	0.0202	0.36	0.53	0.63	0.61	1.53	1.64	1.77	0.221	0.81
1265	0.042	0.056	0.0186	0.55	0.55	0.76	0.95	1.52	1.77	1.91	0.221	0.60

time	qEH	DirE	qEB	DirEB	qBG	DirB	qYL	DirYL
1	0.000000	0	0.000000	0	0.000000	0	0.000000	0
5	0.000000	0	0.000000	0	0.000000	0	0.000000	0
9	0.000000	0	0.000000	0	0.000000	0	0.000000	0
13	0.000045	350	0.000032	350	0.000045	359	0.000006	359
17	0.000000	0	0.000000	0	0.000000	0	0.000000	0
21	0.000000	0	0.000000	0	0.000000	0	0.000000	0
25	0.000000	0	0.000000	0	0.000000	0	0.000000	0
29	0.000419	187	0.000326	197	0.000612	173	0.001444	171
33	0.000075	209	0.000411	209	0.000194	203	0.000837	203
37	0.000132	35	0.000546	35	0.000353	24	0.001300	23
41	0.000037	88	0.000021	51	0.000093	67	0.000096	83
45	0.000357	207	0.000275	219	0.000556	194	0.001310	192
49	0.000000	0	0.000000	0	0.000000	0	0.000000	0
53	0.000042	219	0.000030	228	0.000064	202	0.000045	201
57	0.000006	217	0.000009	217	0.000022	219	0.000000	219
61	0.000071	344	0.000014	342	0.000081	351	0.000043	350
65	0.000000	0	0.000000	0	0.000000	0	0.000000	0
69	0.000000	0	0.000000	0	0.000000	0	0.000000	0
73	0.000000	0	0.000000	0	0.000000	0	0.000000	0
77	0.000000	0	0.000000	0	0.000000	0	0.000000	0
81	0.000036	177	0.000026	177	0.000040	177	0.000002	177
85	0.000000	0	0.000000	0	0.000000	0	0.000000	0
89	0.000041	15	0.000041	11	0.000059	32	0.000045	33
93	0.000211	195	0.000264	198	0.000289	179	0.000735	178
97	0.000000	8	0.000237	8	0.000126	5	0.000579	334
101	0.000002	15	0.002666	14	0.001128	16	0.003978	19
105	0.000152	185	0.004466	185	0.004768	191	0.008124	193
109	0.000339	341	0.000714	5	0.001850	344	0.003115	330
113	0.000181	355	0.001102	355	0.000776	345	0.002595	344
117	0.000165	253	0.001002	257	0.001018	241	0.002820	238
121	0.000021	322	0.000076	322	0.000045	313	0.000078	312
125	0.000083	42	0.000160	44	0.000142	27	0.000366	26
129	0.000029	225	0.000036	231	0.000055	208	0.000048	207
133	0.000000	0	0.000000	0	0.000000	0	0.000000	0
137	0.000017	333	0.000004	328	0.000042	336	0.000001	336
141	0.000129	138	0.000122	137	0.000100	139	0.000127	139
145	0.000000	0	0.000000	0	0.000000	0	0.000000	0
149	0.000000	0	0.000000	0	0.000000	0	0.000000	0
153	0.000119	162	0.000091	162	0.000083	158	0.000071	158
157	0.000000	0	0.000000	0	0.000000	0	0.000000	0
161	0.000000	0	0.000000	0	0.000000	0	0.000000	0
165	0.000153	155	0.000098	155	0.000095	146	0.000089	145
169	0.000000	0	0.000000	0	0.000000	0	0.000000	0
173	0.000000	0	0.000000	0	0.000000	0	0.000000	0

time	qEH	DirE	qEB	DirEB	qBG	DirB	qYL	DirYL
177	0.000000	0	0.000000	0	0.000000	0	0.000000	0
181	0.000000	0	0.000000	0	0.000000	0	0.000000	0
185	0.000027	0	0.000014	2	0.000039	343	0.000001	343
189	0.000000	0	0.000000	0	0.000000	0	0.000000	0
193	0.000000	0	0.000000	0	0.000000	0	0.000000	0
197	0.000273	352	0.000221	352	0.000173	349	0.000319	349
201	0.000020	159	0.000011	165	0.000037	140	0.000002	140
205	0.000000	0	0.000000	0	0.000000	0	0.000000	0
209	0.000000	0	0.000000	0	0.000000	0	0.000000	0
213	0.000000	0	0.000000	0	0.000000	0	0.000000	0
217	0.000000	0	0.000000	0	0.000000	0	0.000000	0
221	0.000030	335	0.000050	335	0.000043	341	0.000027	341
225	0.000000	0	0.000000	0	0.000000	0	0.000000	0
229	0.000000	0	0.000000	0	0.000000	0	0.000000	0
233	0.000000	0	0.000000	0	0.000000	0	0.000000	0
237	0.000000	0	0.000000	0	0.000000	0	0.000000	0
241	0.000026	189	0.000042	189	0.000039	194	0.000017	194
245	0.000000	0	0.000000	0	0.000000	0	0.000000	0
249	0.000000	0	0.000000	0	0.000000	0	0.000000	0
253	0.000000	0	0.000000	0	0.000000	0	0.000000	0
257	0.000000	0	0.000000	0	0.000000	0	0.000000	0
261	0.000000	0	0.000000	0	0.000000	0	0.000000	0
265	0.000153	214	0.000125	220	0.000173	198	0.000341	196
269	0.000001	222	0.000006	222	0.000009	234	0.000000	234
273	0.000020	39	0.000061	40	0.000038	39	0.000040	39
277	0.000030	204	0.000046	214	0.000073	192	0.000100	190
281	0.000000	0	0.000000	0	0.000000	0	0.000000	0
285	0.000000	0	0.000000	0	0.000000	0	0.000000	0
289	0.000000	0	0.000000	0	0.000000	0	0.000000	0
293	0.000000	0	0.000000	0	0.000000	0	0.000000	0
297	0.000437	16	0.001197	16	0.001112	7	0.002747	6
301	0.000003	105	0.000001	105	0.000098	34	0.000229	105
305	0.000004	208	0.000082	208	0.000021	201	0.000090	201
309	0.000000	21	0.000003	22	0.000002	20	0.000005	356
313	0.000016	210	0.000061	210	0.000038	199	0.000057	198
317	0.000000	0	0.000000	0	0.000000	0	0.000000	0
321	0.000019	25	0.000095	26	0.000051	13	0.000142	12
325	0.000000	29	0.000002	29	0.000006	37	0.000000	37
329	0.000000	0	0.000000	0	0.000000	0	0.000000	0
333	0.000000	0	0.000000	0	0.000000	0	0.000000	0
337	0.000000	0	0.000000	0	0.000000	0	0.000000	0
341	0.000000	0	0.000000	0	0.000000	0	0.000000	0
345	0.000010	8	0.000005	17	0.000032	349	0.000000	349
349	0.000000	0	0.000000	0	0.000000	0	0.000000	0

time	qEH	DirE	qEB	DirEB	qBG	DirB	qYL	DirYL
353	0.000000	0	0.000000	0	0.000000	0	0.000000	0
357	0.000000	0	0.000000	0	0.000000	0	0.000000	0
361	0.000000	0	0.000000	0	0.000000	0	0.000000	0
365	0.000000	0	0.000000	0	0.000000	0	0.000000	0
369	0.000074	328	0.000057	328	0.000060	325	0.000025	325
373	0.000017	332	0.000006	320	0.000039	347	0.000001	347
377	0.000000	0	0.000000	0	0.000000	0	0.000000	0
381	0.000000	0	0.000000	0	0.000000	0	0.000000	0
385	0.000124	336	0.000749	336	0.000385	339	0.001577	339
389	0.000000	158	0.000027	157	0.000003	158	0.000016	158
393	0.000048	3	0.000198	12	0.000194	354	0.000623	348
397	0.001011	6	0.002741	6	0.003737	1	0.005564	0
401	0.000041	159	0.000331	160	0.000160	149	0.000780	148
405	0.000000	153	0.000067	153	0.000007	153	0.000136	153
409	0.000000	0	0.000000	0	0.000000	0	0.000000	0
413	0.000126	154	0.000225	154	0.000153	159	0.000376	159
417	0.000053	292	0.000028	305	0.000085	279	0.000078	278
421	0.000164	327	0.000133	327	0.000125	339	0.000186	339
425	0.000012	124	0.000018	124	0.000026	121	0.000001	121
429	0.000000	0	0.000000	0	0.000000	0	0.000000	0
433	0.000000	0	0.000000	0	0.000000	0	0.000000	0
437	0.000000	0	0.000000	0	0.000000	0	0.000000	0
441	0.000019	171	0.000012	167	0.000035	189	0.000001	189
445	0.000108	4	0.000075	7	0.000094	348	0.000100	348
449	0.000039	21	0.000052	16	0.000069	38	0.000085	39
453	0.000351	197	0.002531	197	0.002317	192	0.005096	192
457	0.000136	17	0.000660	21	0.000581	5	0.001893	3
461	0.000011	39	0.000077	28	0.000088	45	0.000240	62
465	0.000566	206	0.001714	206	0.001943	196	0.003950	195
469	0.000070	19	0.000074	25	0.000104	2	0.000169	1
473	0.000010	26	0.000036	26	0.000026	36	0.000015	36
477	0.000164	194	0.000200	194	0.000166	183	0.000357	183
481	0.000005	15	0.000004	20	0.000026	356	0.000000	356
485	0.000025	22	0.000023	22	0.000037	34	0.000004	34
489	0.000270	186	0.000194	189	0.000217	171	0.000446	170
493	0.000000	0	0.000000	0	0.000000	0	0.000000	0
497	0.000132	9	0.000096	9	0.000087	11	0.000075	11
501	0.000086	180	0.000043	182	0.000067	163	0.000027	163
505	0.000000	0	0.000000	0	0.000000	0	0.000000	0
509	0.000050	27	0.000112	27	0.000076	19	0.000143	19
513	0.000299	200	0.000324	207	0.000472	184	0.001175	183
517	0.000053	206	0.000134	205	0.000095	219	0.000239	219
521	0.000198	34	0.000193	41	0.000295	18	0.000708	16
525	0.000043	211	0.000050	214	0.000063	194	0.000060	194

time	qEH	DirE	qEB	DirEB	qBG	DirB	qYL	DirYL
529	0.000000	0	0.000000	0	0.000000	0	0.000000	0
533	0.001184	11	0.000518	30	0.001465	8	0.003163	5
537	0.000000	0	0.000000	0	0.000000	0	0.000000	0
541	0.000097	214	0.000084	214	0.000076	209	0.000064	209
545	0.000024	7	0.000009	20	0.000046	355	0.000006	354
549	0.000031	196	0.000039	198	0.000049	180	0.000032	179
553	0.000007	210	0.000023	210	0.000021	219	0.000004	219
557	0.000932	23	0.000931	31	0.001930	8	0.003576	6
561	0.000000	0	0.000000	0	0.000000	0	0.000000	0
565	0.000051	190	0.000013	201	0.000069	186	0.000028	185
569	0.000000	0	0.000000	0	0.000000	0	0.000000	0
573	0.000057	187	0.000015	199	0.000071	179	0.000032	178
577	0.000169	215	0.000167	215	0.000134	209	0.000227	209
581	0.000087	344	0.000016	337	0.000083	354	0.000042	352
585	0.000092	54	0.000076	53	0.000071	55	0.000048	55
589	0.000042	164	0.000009	152	0.000054	178	0.000004	177
593	0.000000	0	0.000000	0	0.000000	0	0.000000	0
597	0.000000	0	0.000000	0	0.000000	0	0.000000	0
601	0.000105	218	0.000065	218	0.000068	215	0.000030	215
605	0.000561	304	0.000168	304	0.000094	287	0.000084	302
609	0.000102	30	0.000047	31	0.000065	16	0.000019	16
613	0.000000	0	0.000000	0	0.000000	0	0.000000	0
617	0.000008	177	0.000007	173	0.000027	196	0.000000	196
621	0.000000	0	0.000000	0	0.000000	0	0.000000	0
625	0.000038	173	0.000030	171	0.000047	189	0.000013	190
629	0.000000	0	0.000000	0	0.000000	0	0.000000	0
633	0.000762	350	0.000520	351	0.000396	349	0.000952	349
637	0.000000	0	0.000000	0	0.000000	0	0.000000	0
641	0.000000	0	0.000000	0	0.000000	0	0.000000	0
645	0.000000	0	0.000000	0	0.000000	0	0.000000	0
649	0.000000	0	0.000000	0	0.000000	0	0.000000	0
653	0.000000	0	0.000000	0	0.000000	0	0.000000	0
657	0.000071	326	0.000042	326	0.000054	333	0.000011	333
661	0.000000	0	0.000000	0	0.000000	0	0.000000	0
665	0.000000	0	0.000000	0	0.000000	0	0.000000	0
669	0.000000	0	0.000000	0	0.000000	0	0.000000	0
673	0.000000	0	0.000000	0	0.000000	0	0.000000	0
677	0.000000	0	0.000000	0	0.000000	0	0.000000	0
681	0.000200	338	0.000118	338	0.000105	333	0.000104	333
685	0.000000	0	0.000000	0	0.000000	0	0.000000	0
689	0.000000	0	0.000000	0	0.000000	0	0.000000	0
693	0.000000	0	0.000000	0	0.000000	0	0.000000	0
697	0.000000	0	0.000000	0	0.000000	0	0.000000	0
701	0.000000	0	0.000000	0	0.000000	0	0.000000	0

time	qEH	DirE	qEB	DirEB	qBG	DirB	qYL	DirYL
705	0.000000	0	0.000000	0	0.000000	0	0.000000	0
709	0.000000	0	0.000000	0	0.000000	0	0.000000	0
713	0.000000	0	0.000000	0	0.000000	0	0.000000	0
717	0.000000	0	0.000000	0	0.000000	0	0.000000	0
721	0.000000	0	0.000000	0	0.000000	0	0.000000	0
725	0.000000	0	0.000000	0	0.000000	0	0.000000	0
729	0.000000	0	0.000000	0	0.000000	0	0.000000	0
733	0.000103	325	0.000056	324	0.000071	339	0.000035	339
737	0.000000	0	0.000000	0	0.000000	0	0.000000	0
741	0.000000	0	0.000000	0	0.000000	0	0.000000	0
745	0.000000	0	0.000000	0	0.000000	0	0.000000	0
749	0.000000	0	0.000000	0	0.000000	0	0.000000	0
753	0.000000	0	0.000000	0	0.000000	0	0.000000	0
757	0.000142	349	0.000087	349	0.000083	345	0.000057	345
761	0.000000	0	0.000000	0	0.000000	0	0.000000	0
765	0.000000	0	0.000000	0	0.000000	0	0.000000	0
769	0.000000	0	0.000000	0	0.000000	0	0.000000	0
773	0.000000	0	0.000000	0	0.000000	0	0.000000	0
777	0.000000	0	0.000000	0	0.000000	0	0.000000	0
781	0.000013	24	0.000006	34	0.000035	6	0.000001	6
785	0.000000	0	0.000000	0	0.000000	0	0.000000	0
789	0.000053	195	0.000040	195	0.000049	188	0.000011	188
793	0.000000	0	0.000000	0	0.000000	0	0.000000	0
797	0.000000	0	0.000000	0	0.000000	0	0.000000	0
801	0.000000	0	0.000000	0	0.000000	0	0.000000	0
805	0.000000	0	0.000000	0	0.000000	0	0.000000	0
809	0.000000	0	0.000000	0	0.000000	0	0.000000	0
813	0.000000	0	0.000000	0	0.000000	0	0.000000	0
817	0.000000	0	0.000000	0	0.000000	0	0.000000	0
821	0.000000	0	0.000000	0	0.000000	0	0.000000	0
825	0.000151	180	0.000085	186	0.000128	163	0.000177	162
829	0.000000	0	0.000000	0	0.000000	0	0.000000	0
833	0.000007	196	0.000015	202	0.000027	181	0.000007	181
837	0.000733	201	0.001560	201	0.001732	192	0.003516	192
841	0.000013	342	0.000023	23	0.000087	3	0.000122	329
845	0.000149	31	0.000207	32	0.000180	18	0.000426	18
849	0.000030	207	0.000053	215	0.000072	193	0.000108	192
853	0.000003	223	0.000023	223	0.000014	225	0.000003	225
857	0.000000	0	0.000000	0	0.000000	0	0.000000	0
861	0.000077	214	0.000025	228	0.000088	203	0.000067	202
865	0.000000	0	0.000000	0	0.000000	0	0.000000	0
869	0.000243	355	0.000065	359	0.000081	11	0.000032	9
873	0.000000	0	0.000000	0	0.000000	0	0.000000	0
877	0.000000	0	0.000000	0	0.000000	0	0.000000	0

time	qEH	DirE	qEB	DirEB	qBG	DirB	qYL	DirYL
881	0.000000	0	0.000000	0	0.000000	0	0.000000	0
885	0.000169	199	0.000072	205	0.000115	181	0.000126	180
889	0.000000	0	0.000000	0	0.000000	0	0.000000	0
893	0.000353	7	0.000234	7	0.000213	355	0.000421	354
897	0.000009	133	0.000007	133	0.000029	126	0.000000	126
901	0.000000	0	0.000000	0	0.000000	0	0.000000	0
905	0.000000	0	0.000000	0	0.000000	0	0.000000	0
909	0.000000	0	0.000000	0	0.000000	0	0.000000	0
913	0.000000	0	0.000000	0	0.000000	0	0.000000	0
917	0.000083	28	0.000103	31	0.000115	11	0.000215	11
921	0.000000	0	0.000000	0	0.000000	0	0.000000	0
925	0.000003	211	0.000262	212	0.000045	211	0.000547	211
929	0.000049	33	0.000269	33	0.000130	23	0.000550	23
933	0.000001	41	0.000009	41	0.000008	51	0.000000	52
937	0.000000	0	0.000000	0	0.000000	0	0.000000	0
941	0.000008	33	0.000008	37	0.000026	15	0.000000	15
945	0.000000	0	0.000000	0	0.000000	0	0.000000	0
949	0.000000	0	0.000000	0	0.000000	0	0.000000	0
953	0.000000	0	0.000000	0	0.000000	0	0.000000	0
957	0.000000	0	0.000000	0	0.000000	0	0.000000	0
961	0.000000	0	0.000000	0	0.000000	0	0.000000	0
965	0.000000	0	0.000000	0	0.000000	0	0.000000	0
969	0.000000	0	0.000000	0	0.000000	0	0.000000	0
973	0.000000	0	0.000000	0	0.000000	0	0.000000	0
977	0.000000	0	0.000000	0	0.000000	0	0.000000	0
981	0.000000	0	0.000000	0	0.000000	0	0.000000	0
985	0.000000	0	0.000000	0	0.000000	0	0.000000	0
989	0.000000	0	0.000000	0	0.000000	0	0.000000	0
993	0.000000	0	0.000000	0	0.000000	0	0.000000	0
997	0.000000	0	0.000000	0	0.000000	0	0.000000	0
1001	0.000000	0	0.000000	0	0.000000	0	0.000000	0
1005	0.000000	0	0.000000	0	0.000000	0	0.000000	0
1009	0.000000	0	0.000000	0	0.000000	0	0.000000	0
1013	0.000000	0	0.000000	0	0.000000	0	0.000000	0
1017	0.000186	7	0.000142	8	0.000142	354	0.000231	353
1021	0.000000	0	0.000000	0	0.000000	0	0.000000	0
1025	0.000000	0	0.000000	0	0.000000	0	0.000000	0
1029	0.000000	0	0.000000	0	0.000000	0	0.000000	0
1033	0.000000	0	0.000000	0	0.000000	0	0.000000	0
1037	0.000000	0	0.000000	0	0.000000	0	0.000000	0
1041	0.000070	354	0.000043	354	0.000055	345	0.000013	345
1045	0.000000	0	0.000000	0	0.000000	0	0.000000	0
1049	0.000000	0	0.000000	0	0.000000	0	0.000000	0
1053	0.000000	0	0.000000	0	0.000000	0	0.000000	0

time	qEH	DirE	qEB	DirEB	qBG	DirB	qYL	DirYL
1057	0.000000	0	0.000000	0	0.000000	0	0.000000	0
1061	0.000000	0	0.000000	0	0.000000	0	0.000000	0
1065	0.000000	0	0.000000	0	0.000000	0	0.000000	0
1069	0.000000	0	0.000000	0	0.000000	0	0.000000	0
1073	0.000000	0	0.000000	0	0.000000	0	0.000000	0
1077	0.000000	0	0.000000	0	0.000000	0	0.000000	0
1081	0.000000	0	0.000000	0	0.000000	0	0.000000	0
1085	0.000000	0	0.000000	0	0.000000	0	0.000000	0
1089	0.000000	0	0.000000	0	0.000000	0	0.000000	0
1093	0.000000	0	0.000000	0	0.000000	0	0.000000	0
1097	0.000000	0	0.000000	0	0.000000	0	0.000000	0
1101	0.000000	0	0.000000	0	0.000000	0	0.000000	0
1105	0.000000	0	0.000000	0	0.000000	0	0.000000	0
1109	0.000000	0	0.000000	0	0.000000	0	0.000000	0
1113	0.000000	0	0.000000	0	0.000000	0	0.000000	0
1117	0.000000	0	0.000000	0	0.000000	0	0.000000	0
1121	0.000004	145	0.000003	146	0.000027	130	0.000000	130
1125	0.000027	152	0.000018	148	0.000040	169	0.000004	170
1129	0.000000	0	0.000000	0	0.000000	0	0.000000	0
1133	0.000057	123	0.000049	123	0.000053	129	0.000020	129
1137	0.000000	0	0.000000	0	0.000000	0	0.000000	0
1141	0.000029	317	0.000027	317	0.000039	329	0.000005	329
1145	0.000000	0	0.000000	0	0.000000	0	0.000000	0
1149	0.000013	191	0.000003	197	0.000042	206	0.000000	206
1153	0.000000	0	0.000000	0	0.000000	0	0.000000	0
1157	0.000000	0	0.000000	0	0.000000	0	0.000000	0
1161	0.000000	0	0.000000	0	0.000000	0	0.000000	0
1165	0.000000	0	0.000000	0	0.000000	0	0.000000	0
1169	0.000000	0	0.000000	0	0.000000	0	0.000000	0
1173	0.000105	206	0.000057	208	0.000075	191	0.000043	191
1177	0.000082	359	0.000023	12	0.000078	346	0.000042	345
1181	0.000000	0	0.000000	0	0.000000	0	0.000000	0
1185	0.000000	0	0.000000	0	0.000000	0	0.000000	0
1189	0.000000	0	0.000000	0	0.000000	0	0.000000	0
1193	0.000000	0	0.000000	0	0.000000	0	0.000000	0
1197	0.000195	195	0.000127	195	0.000112	189	0.000128	189
1201	0.000035	336	0.000006	346	0.000050	329	0.000003	329
1205	0.000719	340	0.000398	334	0.000555	356	0.001355	357
1209	0.000013	153	0.000014	153	0.000029	146	0.000000	146
1213	0.000000	0	0.000000	0	0.000000	0	0.000000	0
1217	0.000000	0	0.000000	0	0.000000	0	0.000000	0
1221	0.000047	189	0.000009	178	0.000058	202	0.000008	201
1225	0.000049	278	0.000047	278	0.000051	286	0.000022	287
1229	0.003797	2	0.002592	1	0.002657	2	0.005271	2

time	qEH	DirE	qEB	DirEB	qBG	DirB	qYL	DirYL
1233	0.000026	157	0.000011	164	0.000041	138	0.000002	138
1237	0.000026	178	0.000018	178	0.000036	173	0.000001	173
1241	0.000000	0	0.000000	0	0.000000	0	0.000000	0
1245	0.000661	186	0.000585	186	0.000486	180	0.001190	180
1249	0.000101	246	0.000021	249	0.000103	237	0.000087	239
1253	0.003137	2	0.001873	14	0.005150	351	0.007468	348
1257	0.000000	0	0.000000	0	0.000000	0	0.000000	0
1261	0.000000	0	0.000000	0	0.000000	0	0.000000	0
1265	0.000000	0	0.000000	0	0.000000	0	0.000000	0