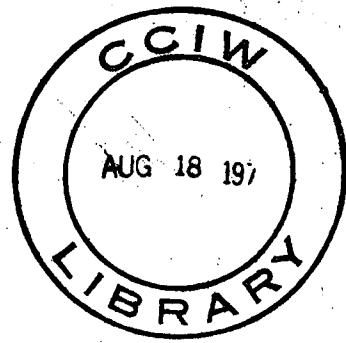


HYDRAULICS RESEARCH DIVISION
Technical Note



DATE: July 1978 **REPORT NO:** 78-12

TITLE: "Air-Photo Reconnaissance, Great Lakes' Shorelines"

AUTHOR: N. A. Rukavina

REASON FOR REPORT:

In support of EPS contract on Great Lakes Coastal Environment Classification for Oil-Spill Contingency Planning.

CORRESPONDENCE FILE NO:

2182-1

1.0 INTRODUCTION

This report is a photographic document of reconnaissance flights of the Canadian shoreline of the Great Lakes made during late May 1978 in support of an EPS contract on coastal environment classification for oil-spill contingency planning. The author and contractor flew and photographed portions of the shores of Lakes Erie, St. Clair, Huron (including Georgian Bay), Superior and connecting channels. The report consists of an edited set of 35 mm colour slides with captions and notes, assembled primarily to assist the contractor, but also for general use as a synoptic record of Great Lakes' shore types.

2.0 FLIGHT CONDITIONS

Flights were made on May 27 and May 30, 1978. Flight paths are shown in Figures 1 and 2. The May 27th flight was in a single-engine high-wing aircraft at an elevation of 150-200 m. Weather was clear and sunny and photographs are in good focus and properly exposed. The May 30th flight was by helicopter at an elevation of 75-150 m. Weather was overcast with occasional rain and fog patches and photographs are generally of poorer quality.

3.0 PHOTOGRAPHY

Site selection for photographs was somewhat haphazard because of the need to observe, navigate and photograph simultaneously. In general, my emphasis was on depositional features with some evidence of littoral drift direction, the intent being to provide a slide set complementary to the contractor's photographs of major shore types. Good control on sites photographed was available for the shoreline south of Midland from D.P.W. strip charts (1969). North of Midland and in Lake Superior crude estimates of position were obtained from the N.T.S. 1:250,000 scale series topographic maps. Figures 3 to 9 show the approximate locations of the photographs.

4.0 IDENTIFICATION OF SLIDES

Slides and associated captions are labelled with date and sequence number. Occasional breaks in sequence occur as the result of editing of poor quality or redundant slides.

Captions locate the slides, indicate the perspective, and in some instances, note evidence of net littoral drift direction inferred from accumulation patterns or stream diversion. Notes have been interjected where important features were observed but not photographed or where general observations were made.

SLIDE CAPTIONS AND NOTES

Lake Erie

78-5-27:

- 1 Crystal Beach looking west
 - 2 Nearshore rock shelf south-east side of Point Abino
 - 3 Beach and dunes, Sherkston Beach
 - 4 Spit, stream entrance just west of Sherkston Beach, net eastward drift
 - 5 Concrete protective shore wall just west of Rathfon Inn
 - 6 Easternmost exposure of till shore bluffs, west side of Mohawk Point
 - 7 Scalloping in till bluffs west side of Mohawk Point
 - 8 Underwater contact of unconsolidated sediment and bedrock, just west of Grant Point
 - 9 Blott Point: rock island and tombolo
- Note: Very little sediment on west side of Port Maitland jetty (updrift side) because much of shoreline to the west is low and rocky.
- 10 Wardell Creek jetty west of Evans Point, net eastward drift
 - 11 Gates Creek east of Miller Point, evidence of drift reversal
- Note: No sediment accumulation on west side of Hoover Point
- 12 Sandusky Creek mouth, net eastward drift
- Note: Peacock Point has low shore bluffs with some slumping on its east side and small shingle beaches on its west side.
- 13 Nanticoke Creek mouth
 - 14 Eroding bluffs just east of Port Dover, debris cover in attempt to protect houses perched on edge
 - 15 Eroding bluffs and submerged groynes, west side of first point west of Port Dover
 - 16 Port Ryerse, net eastward drift
 - 17 Steep bluffs just west of Camp Ruddy (between Port Ryerse and Fishers Glen)
 - 18 Low protected shore, small jetties at Normandale
 - 19 East end of Turkey Point, sand accumulation behind groyne, net westward drift
 - 20 Sand beach, Turkey Point just east of marina, view of marsh in background
 - 21 Turkey Point marsh

- 22 Long Point, view west from Rice Bay
- 23 Long Point, view east from Rice Bay
- 24 Long Point, two views west from westernmost dunes
- 25
- 26 Long Point, two views east from westernmost dunes
- 27
- 28 Long Point Provincial Park, note sand fences
- 29
- 30 Bluff failure just west of Long Point Creek
- 31 Perched dunes, Sand Hills Park, Jacksonburg
- 32 Gullied sand bluffs vicinity of Hemlock
- 33- Overlapping sequence of gullied bluffs east of Port Burwell, site of Zeman's
- 37 bluff recession study
- 38
- 39 Port Burwell, two views looking east, net eastward drift

Note: Bluffs between Port Burwell and Port Bruce are mainly till with a sand cap. Much evidence of slumping. Slump promontories collect beaches on their west side. Net eastward drift.

- 40 "Deposit" of tires on bluff between Port Bruce and Port Stanley

Note: Upper sand sequence in bluff thickens towards Port Stanley to form one-half to one-third of bluff

- 41 Recent slides just east of Port Stanley
- 42 Port Stanley, view west
- 43 Port Stanley, dredge-filling in progress on east side
- 44 Eroding bluffs west of Port Stanley encroaching upon road and driveway
- 45 Spit at gully base between Port Stanley and Port Talbot, evidence of littoral drift reversal
- 46 Port Talbot, spit at mouth of Talbot Creek, net westward drift (previous evidence - thesis Rukavina - of net eastward drift at this site)
- 47 Steep shore bluffs in front of Malahide Farms, Port Talbot

Note: Bluff character changes west of Port Talbot to vertical bluffs of till standing in water. No beaches.

- 48 Massive bluff failure just west of Plum Point
- 49 Gullied bluffs west of Patrick Point with uniform gully spacing
- 50 Small creek entrance west of Patrick Point with spit development indicating net westward drift

- 51 Creek entrance vicinity of Port Glasgow with westward building spit
- 52 Creek entrance just east of eastward limit of Rondeau Spit, westward building spit
- 53 Beach and offshore bars, east side of Rondeau
- 54 View west from Rondeau Point
- 55 View east from Rondeau Point
- 56 West spit of Rondeau looking west, net eastward drift
- 57 Submerged groynes, armoured beach, west side of Rondeau
- 58 Groynes filling from the east just west of Erie Beach
- 59 Groyne filling from east, bluffs east of Wheatley Provincial Park
- 60 Yellow Creek entrance just east of Wheatley Provincial Park, net westward drift
- 61 Jetties-Wheatley Provincial Park, net westward drift
- 62 Wheatley Harbour, net westward drift

Note: West of Wheatley there is extensive and varied shore protection - groynes, rubble, pilings, etc.

- 63 Spit development at breach in beach between Marentette Lake Park and Marentette Beach, evidence of littoral drift reversal
- 65 View of major breach in east beach of Pelee just south of dike, twin spits with greater development of southward extending spit
- 66 Beach washover into the marsh, middle portion east beach
- 67 Pelee Point looking west
- 68 Overhead view of Pelee Point showing submerged spit extension
- 69 View of Point Pelee looking north
- 72 West beach of Pelee, marsh and boardwalk in background
- 73 West beach of Pelee opposite dike
- 74 View east of Pelee marsh from dike intersection with west beach
- 75 Sturgeon Creek mouth with jetties and marina

Note: North of Sturgeon Creek, beach gives way to armoured shoreline of large boulders, pilings, fill, etc. Extensive cottage development

- 76 Kingsville Harbour, net eastward drift
- 77 Offshore bars extending westward from Kingsville Harbour
- 78 View south of Cedar Creek marina entrance, net eastward drift
- 79 Mouth of Dolson Creek, just east of Cedar Creek. Spit development indicates net westward drift.

Note: Extremely varied shoreline between Kingsville and Colchester - mixture of bluff, low shoreline, armoured shore, groynes, seawalls

- 80 View west of Colchester Harbour
- 81 Armoured shoreline just east of Colchester
- 82 Holiday Beach Provincial Park, eastward-building spit across mouth of Big Creek

Detroit River, Lake St. Clair, St. Clair River

- 83 Beach accumulation on east side of groyne, just west of Bar Point in the mouth of the Detroit River
- 84 View of Detroit River looking south from Windsor
- 85 - Five overlapping shots of Lake St. Clair shoreline vicinity of St. Clair Beach, Windsor. Highly developed shoreline with protection. Beaches indicate net eastward drift.
- 89
- 90 Multiple offshore bars between Pike Creek and Puce
- 91 Belle River mouth, net westward drift
- 92 Stoney Point, east of Ruscom River
- 93 Multiple offshore bars just west of Thames River mouth
- 94 Mouth of Thames River
- 95 Multiple offshore bars in front of marsh within Mitchell Bay
- 96 St. Clair River Delta, view north from Mitchell Bay
- 97 View southwest of birdfoot delta extension offshore from Johnston Bay
- 98 Bassett Channel looking north towards Squirrel Island
- 99 St. Clair River, northwest shore of Squirrel Island, shore erosion by tanker bow wave
- 100 View south of St. Clair River Delta from north tip of Squirrel Island
- 101 St. Clair River east shore opposite Stag Island, low vegetated slopes stabilized by seawalls, some small gully erosion beyond seawall

Lake Huron

- 102, Two views of Sarnia Yacht Club and Lake Huron shoreline east of Point Edward. Beach-groyne shoreline east of yacht club shows net westward drift
- 103

Note: Beaches further east towards Bright's Grove have starved groynes apparently because of interception of littoral drift by jetties at Perch Creek

- 104 Blue Point (Harris Point) looking east. Groynes on east side of point show net westward drift.
- 105 Blue Point, looking southwest
- 107 Close-up of Kettle Point, low bedrock shore of friable shale
- 108 Cape Ipperwash and beaches of Ipperwash Provincial Park to the east, net westward drift
- 109 Ipperwash Beach and multiple bar system
- 110 Ipperwash Provincial Park, beach and dune shoreline
- 111 Beach and dune shoreline north of Port Franks, Pinery Provincial Park
- Note: Beach-dune shoreline is continuous from Port Franks to Grand Bend
- 112 Ausable River mouth, Grand Bend, net southward drift
- Note: Dunes give way to high bluff shore east of Grand Bend.
- 113 Bayfield River mouth, Bayfield, net southward drift
- 114 Maitland River mouth, Goderich
- 115 Wright Point
- 116 Wright Point and shoreline to the south
- 117 Point south of Port Albert, exposed bedrock offshore
- Note: The shorebluff north of Clark Point is well back of the shoreline as the result of considerable sediment infilling behind the point.
- 118 Kincardine Harbour
- Note: A pronounced change in shoretype occurs north of Douglas Point. Shore is very irregular in outline. Inshore zone is shallow with exposed bedrock or boulders fronting pocket marshes or beaches.
- 120 Port Elgin, net northward drift
- 121 Southampton, Saugeen River mouth
- 122 Multiple offshore bars, Sauble Beach
- 124 Views of Sauble Beach looking south
- 125
- 126 Multiple bars, Chief's Point Bay
- 127 Howdenvale Bay, looking south

Georgian Bay

- 128 East shore of Bruce Peninsula between Barrow Bay and Melville Sound
- 129 Gravel spit in Melville Sound
- 130 Beaches, marsh, offshore bars in small bay opposite Hay Island
- 131 Gravel Beach typical of north shore of Colpoys Bay
- 132 Jetty, village of Colpoys Bay
- Note: Inshore slope of Colpoys Bay is steeper on the north shore than on the south.

- 133 Views of the "Clay Banks" - high till bluffs west of Cape Rich
- 134
- 136 Boulder beach and shelf just west of Cape Rich
- 137 Till bluff east of Meaford
- 138 Wasaga Beach and offshore bars looking west
- 139 Spratt Point, looking south
- 140 Beausoleil Island, Georgian Bay Islands National Park
- 142 Honey Harbour
- 143 - Typical views of low, irregular bedrock shoreline, Honey Harbour to Parry
- 149 Sound

Lake Superior

78-5-30:

North Gros Cap to Goulais Bay

- 1 Sand beaches, groynes
- 2
- 3 Rock shore, cobble beach
- 4
- 5 Rock shore with gravel pocket beaches
- 7, Extensive narrow gravel-cobble beaches, shallow offshore slope with
- 9 exposed bedrock, cobbles, boulders
- 11
- 12 Sand flats, mouth of the Goulais River
- 14
- 17 Goulais Bay shore, north of Goulais River

Havilland Bay

- 19 Beaches, sand flats
- 20 Highway causeway
- 22 Mouth of Jones Creek
- 23 Island causeway

Batchawana Bay

- 24 Sand beaches and exposed offshore bars, east coast
- 25
- 26 Sand flats at stream entrance, east coast
- 27 Coarse sand beach south of Harmony River
- 28 Bar enclosing pond, Harmony River mouth

- 29 Sand bluffs, bank of Harmony River
- 30 Sand beach, Batchawana Bay Provincial Park
- 31 Baymouth spits, mouth of Pancake River
- 33 Sand beaches, Pancake Bay

Pancake Bay to Hibbard Bay

- 34 Extensive pebble-cobble beaches
- 35 Pocket beach of sand
- 36 Gravel pocket beaches
- 37 Low rock shore south of Hibbard Bay
- 38
- 39 Large pocket beach, Hibbard Bay

Hibbard Bay to Alona Bay

- 40 Gravel beach with drift line of logs
- 41 Rugged rock coast

Alona Bay to Montreal River

- 42 Cobble-boulder beaches
- 43 Wide gravel beach in front of a small settlement

Montreal River to Agawa Islands

- 44 High rock shore just north of Montreal River
- 45 Extensive pocket beach of yellow sand (MacGregor Cove?)
- 46 Stream entrance south of pocket beach
- 47 Extensive sand beach Agawa Bay
- 48 Agawa River mouth
- 49 -
- 51 Rock coast, Agawa Islands area
- 52
- 53 Agawa Islands, Montreal Island in background
- 54 Agawa River mouth
- 55 View south along southeast shore of Agawa Bay

St. Mary's River

- 64 - North shore St.Mary's River east of Little Lake George, low sand or marsh
- 67 shore

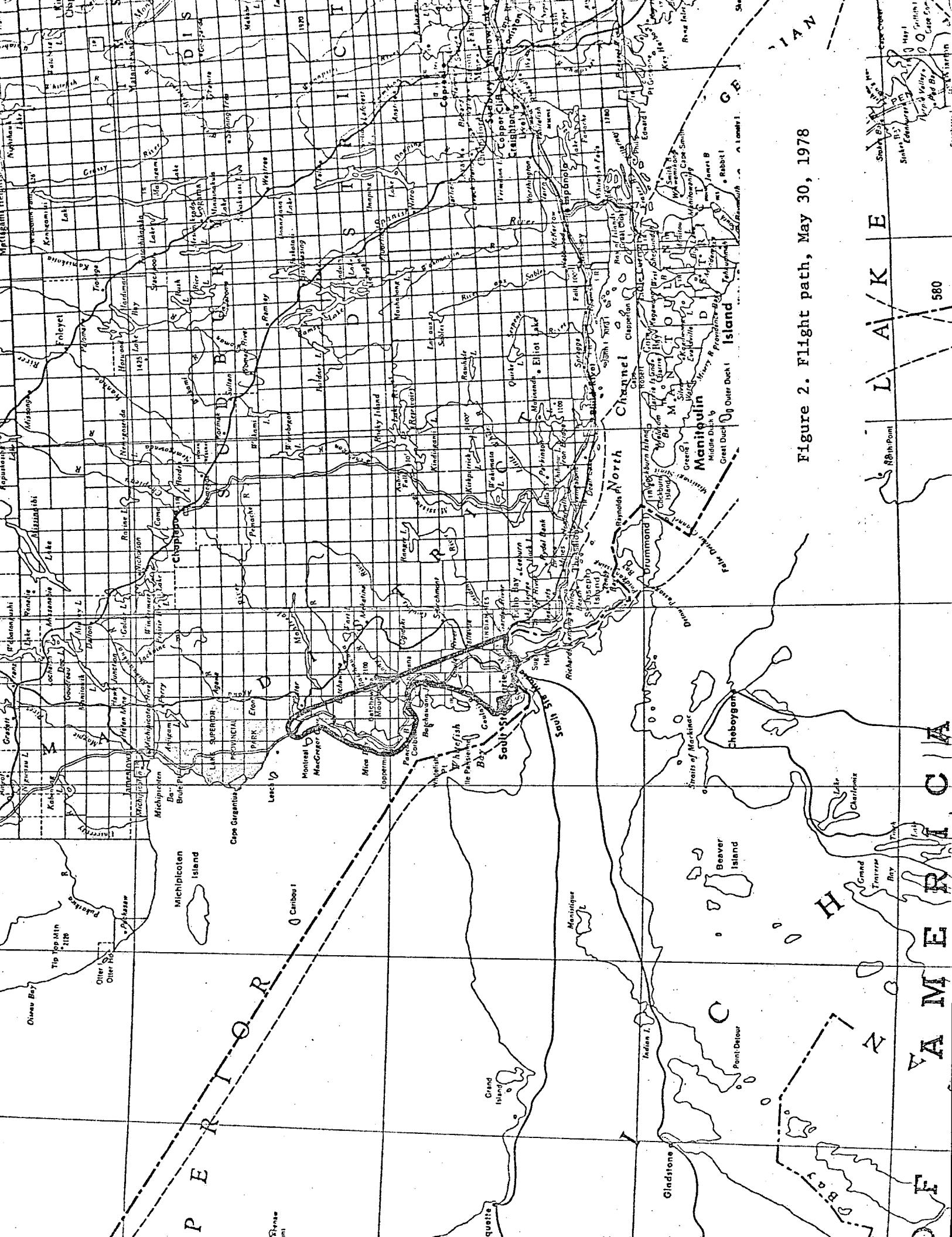
- 68 - Bell Point, mouth of Root River
- 70
- 71 - Shore between Bell and Partridge Points
- 73
- 74 Partridge Point, sea-plane dockage
- 75 Sand beach-groyne shoreline
- 76 Rubble-protected shore just west of sewage outfall
- 77 Shore just east of Algoma Sailing Club
- 78 Algoma Sailing Club
- 79 Shore fill, Great Lakes Forest Research Centre
- 80 Unidentified (new?) dockage
- 81 Low rock shore
- 83 Algoma Steel Plant
- 84 Fill shore just west of Steel Mills
- 85
- 86 Stream entrance, Pointe aux Pins Bay
- 87 Shore, Pointe aux Pins Bay

REFERENCES CITED

Public Works, Canada, 1969, Lake Erie strip charts. Lake Erie Task Force,
International Great Lakes Level Board Study.

 , Lake Huron strip charts. Lake Huron Task Force,
International Great Lakes Level Board Study.

Figure 2. Flight path, May 30, 1978



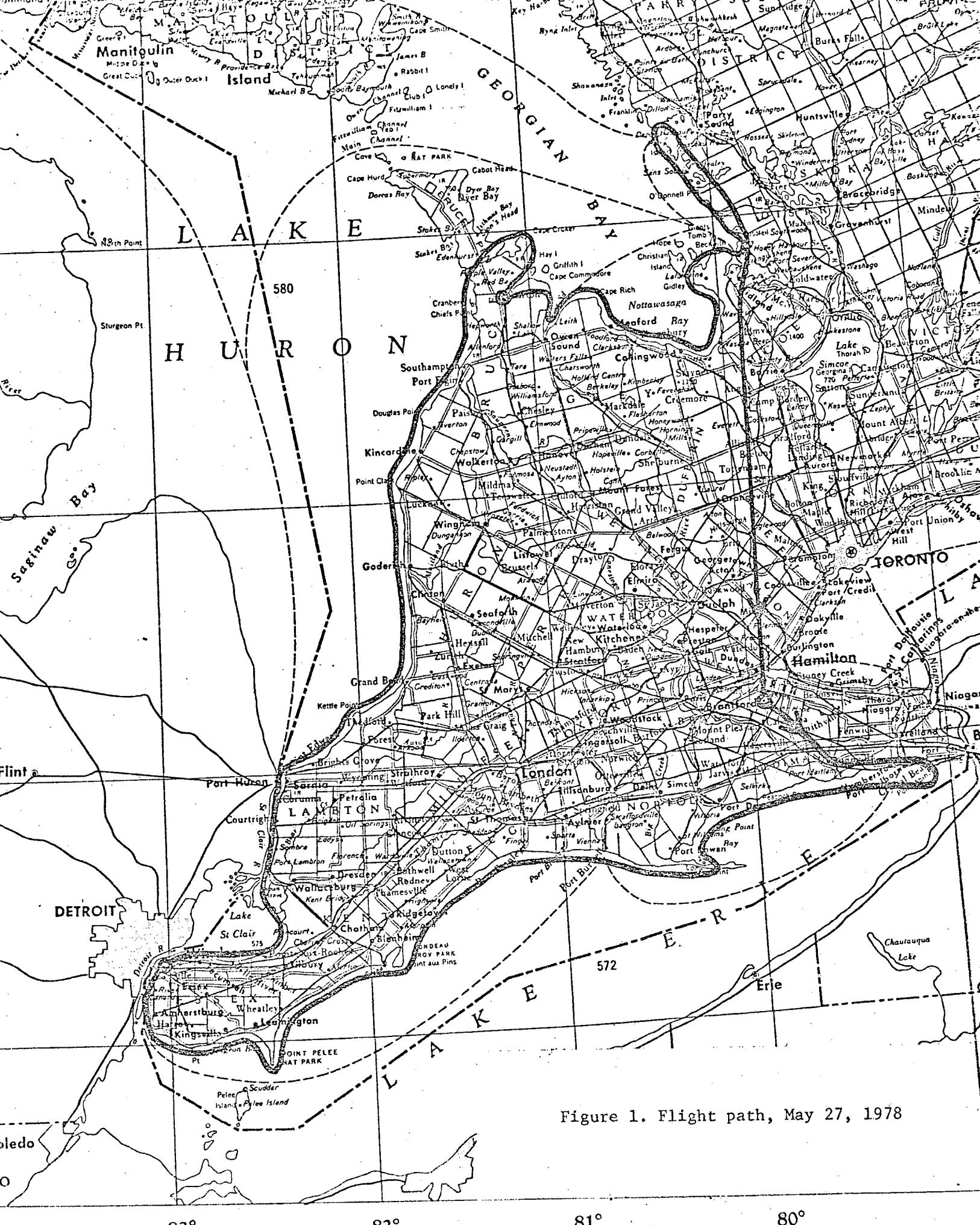


Figure 1. Flight path, May 27, 1978

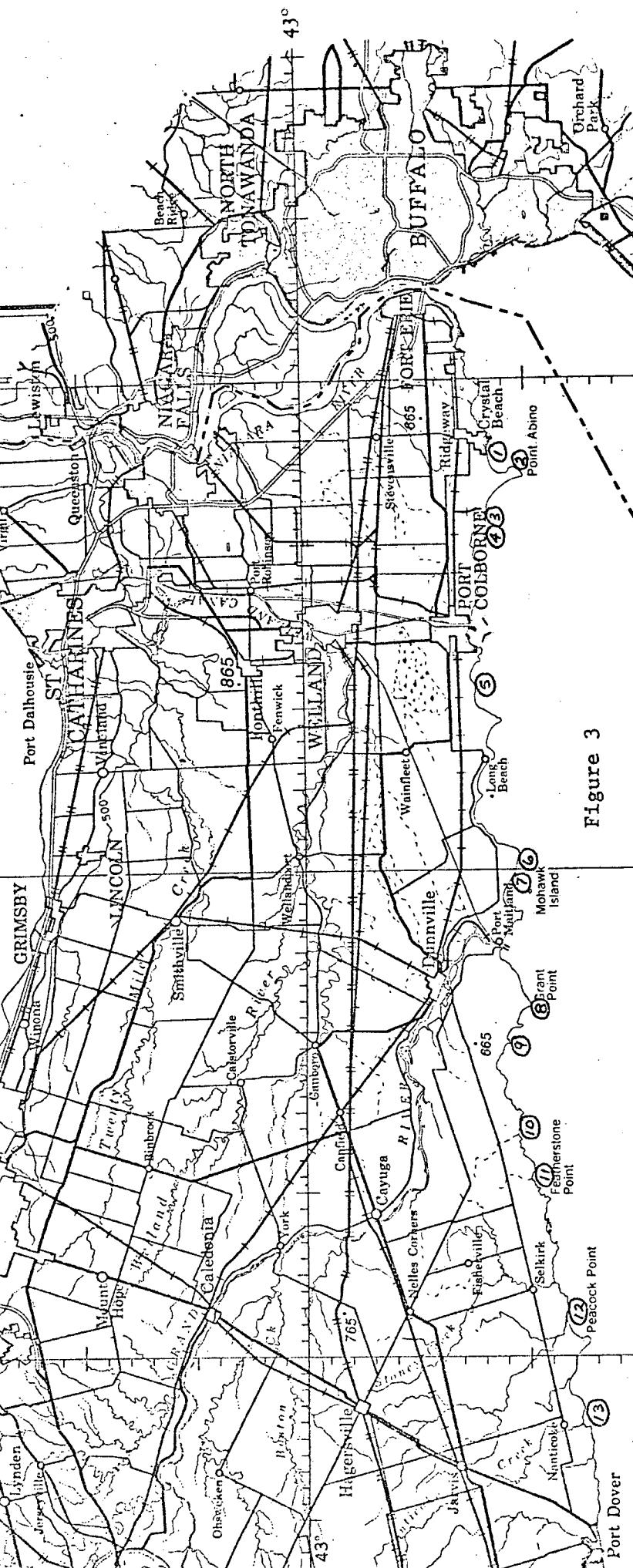


Figure 3

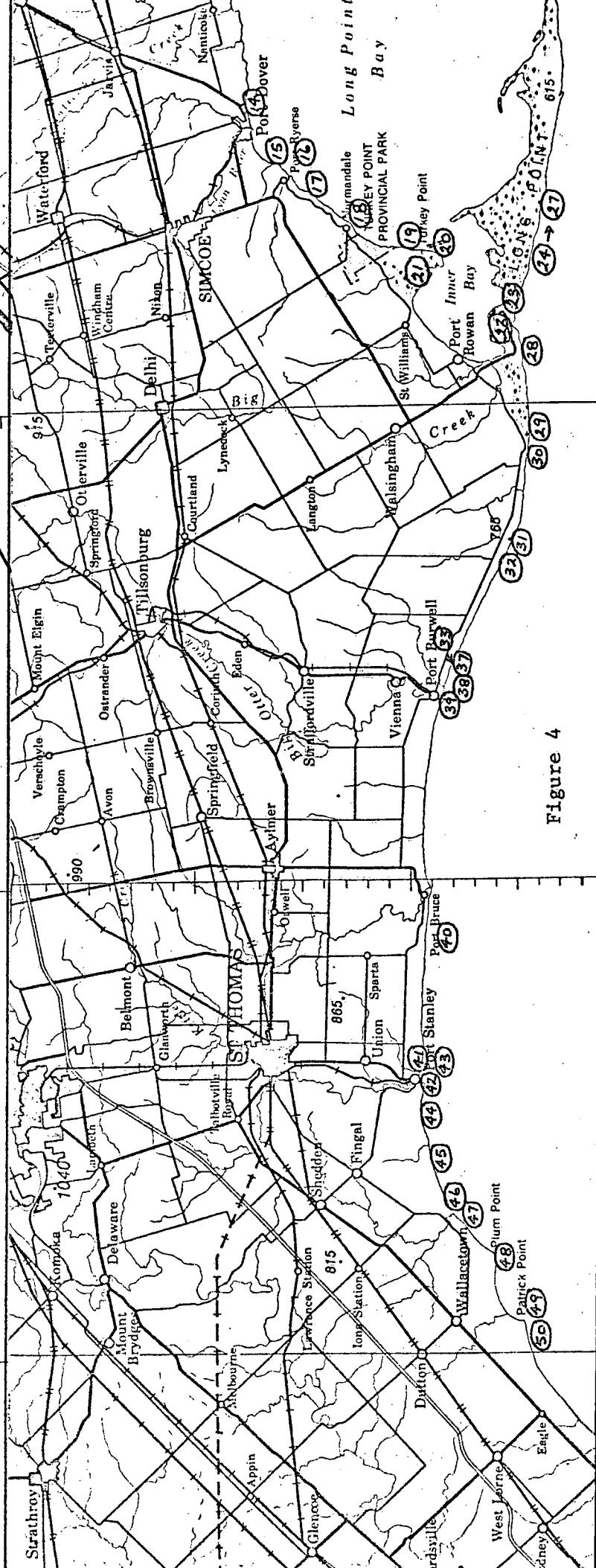
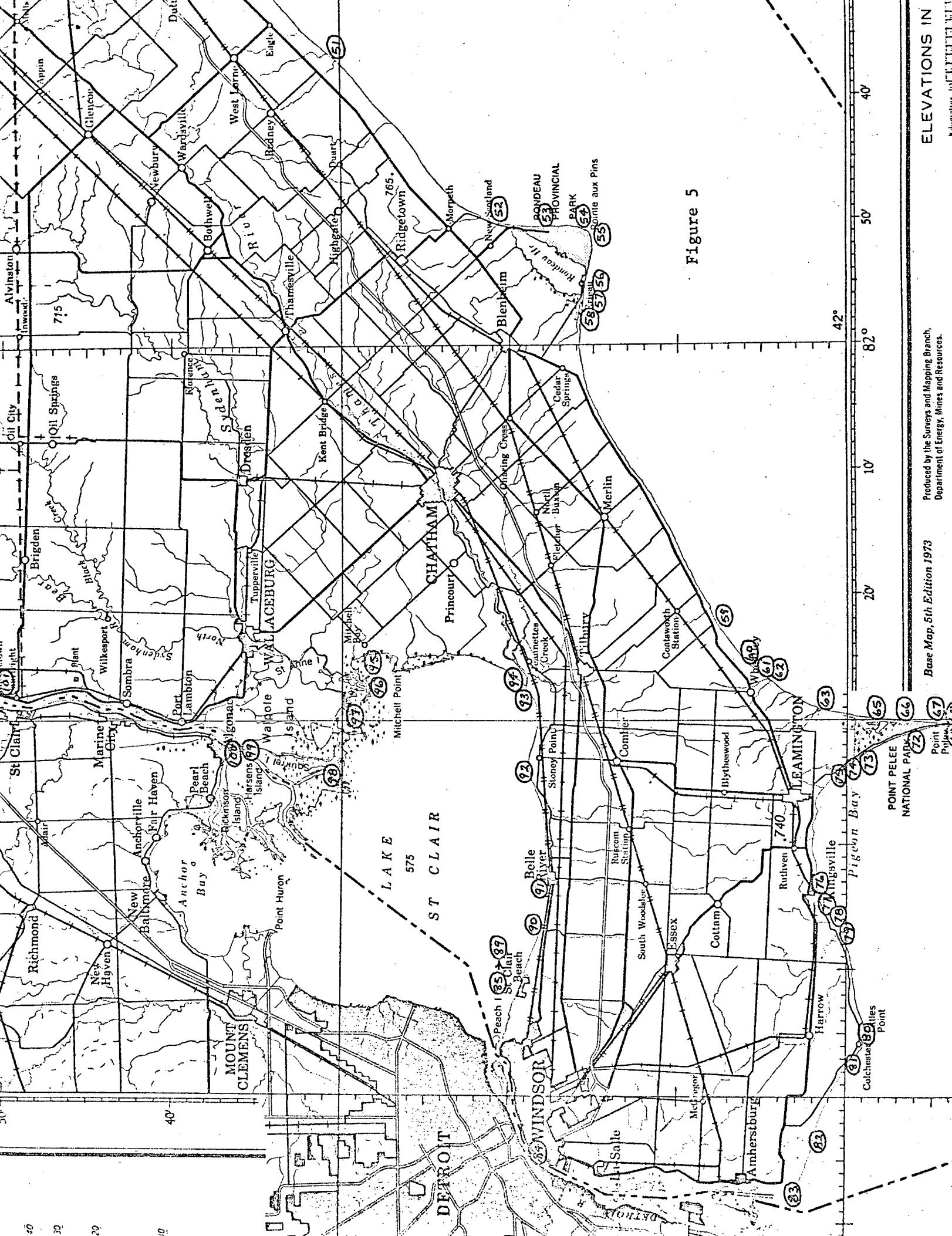


Figure 4

Figure 5



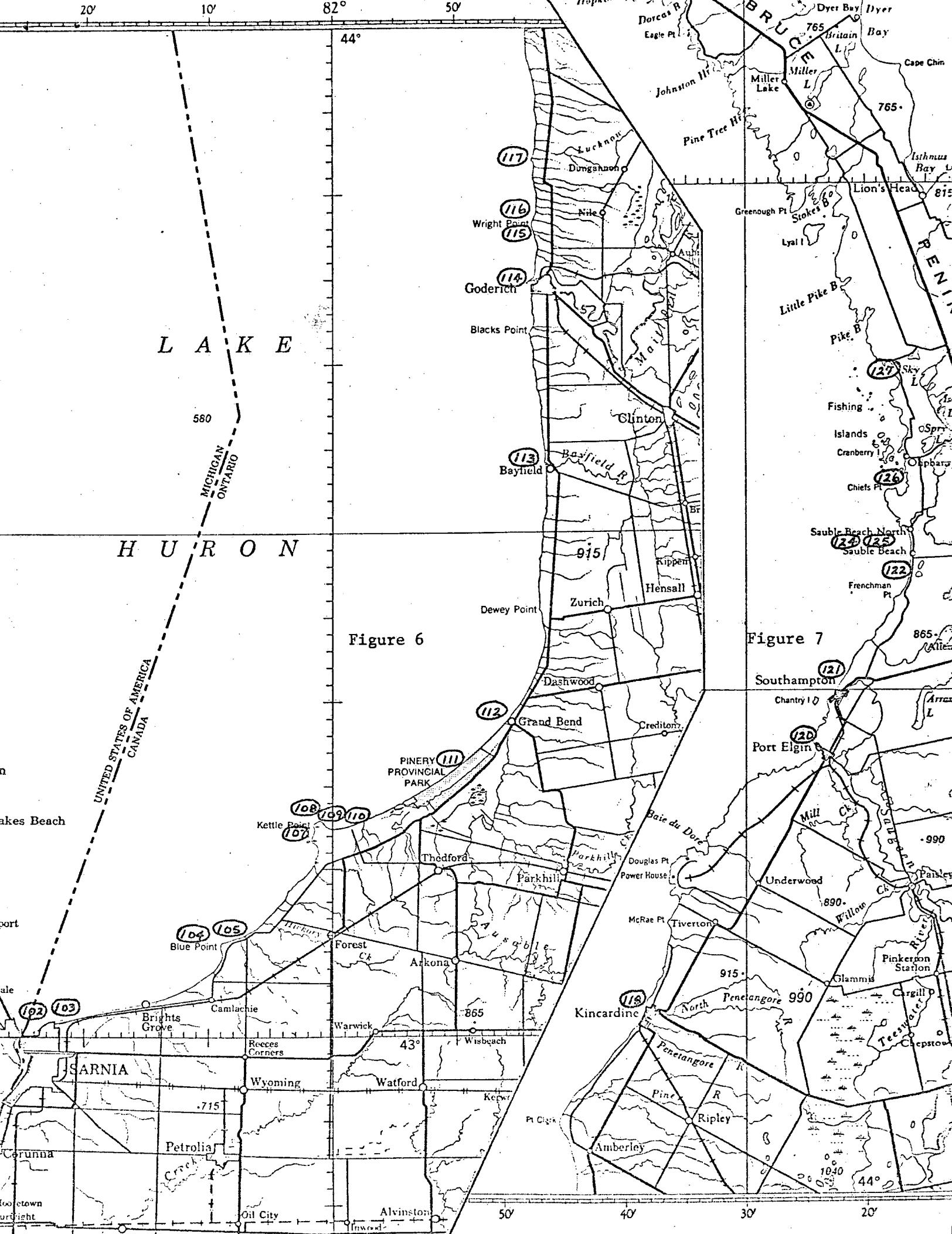


Figure 8

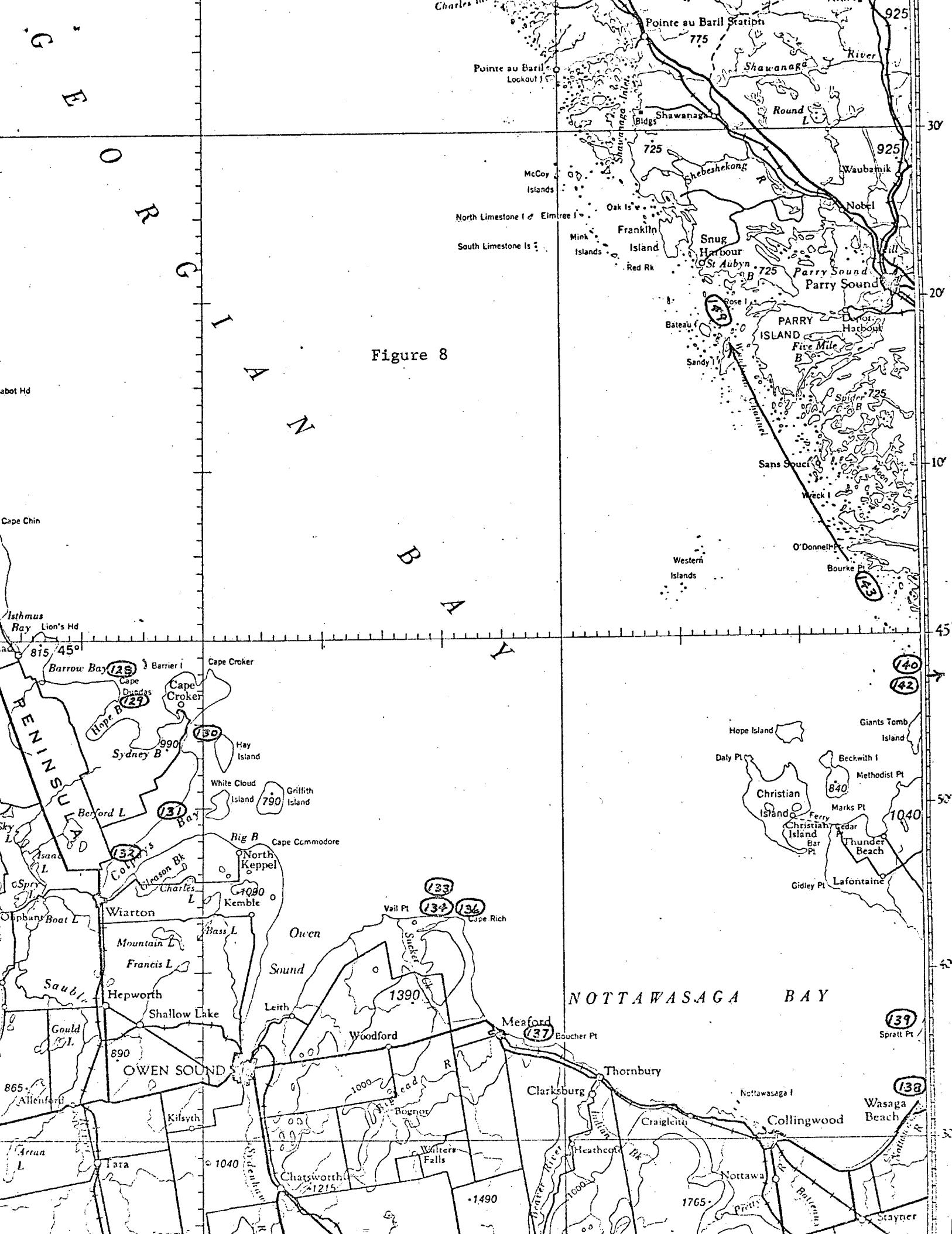


Figure 9

