TP 15320E

Winter Weather Impact on Holdover Time Table Format (1995-2015)

Prepared for
Transportation Development Centre

In cooperation with
Civil Aviation
Transport Canada

and

The Federal Aviation Administration
William J. Hughes Technical Center

Prepared by:

APS Aviation Inc.

August 2015
Final Version 1.0

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by:

Benjamin Bernier and David Youssef

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The contents of this report reflect the views of APS Aviation Inc. and not necessarily the official view or opinions of the Transportation Development Centre of Transport Canada.

The Transportation Development Centre does not endorse products or manufacturers. Trade or manufacturers' names appear in this report only because they are essential to its objectives.

DOCUMENT ORIGIN AND APPROVAL RECORD

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Un sommaire français se trouve avant la table des matières.

PREFACE

Under contract to the Transportation Development Centre of Transport Canada with support from the Federal Aviation Administration (FAA), APS Aviation Inc. (APS) has undertaken a research program to advance aircraft ground de/anti-icing technology. The primary specific objectives of the APS test program are the following:

- To develop holdover time data for all newly-qualified de/anti-icing fluids and update and maintain the website for the holdover time guidelines;
- To evaluate weather data from previous winters that can have an impact on the format of the holdover time guidelines;
- To conduct general and exploratory de/anti-icing research;
- To conduct tests to evaluate the effect of coloured vs. uncoloured fluids on endurance times;
- To obtain full-scale operational documentation of anti-icing fluid flow-off, fluid freezing-in-flight, and residual fluid thickness;
- To conduct tests to evaluate the effect of deployed flaps/slats prior to anti-icing;
- To analyse historical data and/or conduct tests with the snowmaker to support ARP5485 changes;
- To analyse historical data and/or conduct tests to evaluate holdover times for heavy snow conditions;
- To continue research for development of ice detection capabilities for pre-deicing, engine deicing and departing aircraft at the runway threshold;
- To develop training and fluid failure photos/videos for global archive; and
- To update the regression coefficient report with the newly-qualified de/anti-icing fluids.

The research activities of the program conducted on behalf of Transport Canada during the winter of 2014-15 are documented in four reports. The titles of the reports are as follows:

- TP 15320E Winter Weather Impact on Holdover Time Table Format (1995-2015);
- TP 15321E Aircraft Ground De/Anti-Icing Fluid Holdover Time Development Program for the 2014-15 Winter;
- TP 15322E Regression Coefficients and Equations Used to Develop the Winter 2015-16 Aircraft Ground Deicing Holdover Time Tables; and
- TP 15323E Aircraft Ground Icing Research General Activities During the 2014-15 Winter.

In addition, the following one interim report is being prepared:

- *Evaluation of Endurance Times on Extended Flaps and Slats.*

This report, TP 15320E has the following objective:

- To evaluate weather data from previous winters that can have impact on the format of the holdover time guidelines.

This objective was met by acquiring and analysing winter weather data from three meteorological stations in Quebec, Canada. This information was used to review and assess the format of the holdover time guidelines.

PROGRAM ACKNOWLEDGEMENTS

This multi-year research program has been funded by Transport Canada with support from the Federal Aviation Administration, William J. Hughes Technical Center, Atlantic City, NJ. This program could not have been accomplished without the participation of many organizations. APS would therefore like to thank the Transportation Development Centre of Transport Canada, the Federal Aviation Administration, National Research Council Canada, and several fluid manufacturers.

APS would also like to acknowledge the dedication of the research team, whose performance was crucial to the acquisition of hard data. This includes the following people: Yelyzaveta Asnytska, Steven Baker, Stephanie Bendickson, Benjamin Bernier, Chloë Bernier, Trevor Butler, Michael Carlucci, Matthew Budd-Kenny, John D'Avirro, Ben Falvo, Benjamin Guthrie, Jesse Moreland, Dany Posteraro, Marco Ruggi, Michael Stanton, David Youssef, Nondas Zoitakis and Victoria Zoitakis.

Special thanks are extended to Howard Posluns, Yvan Chabot, Doug Ingold, Warren Underwood and Charles J. Enders, who on behalf of the Transportation Development Centre and the Federal Aviation Administration, have participated, contributed and provided guidance in the preparation of these documents.

Transport Canada / Transports Canada

PUBLICATION DATA FORM

1. Transport Canada Publication No.	2. Project No.	3. Recipient's Catalogue No.
TP 15320E	B14W	

4. Title and Subtitle	5. Publication Date
Winter Weather Impact on Holdover Time Table Format (1995-2015)	August 2015
	6. Performing Organization Document No.: CM2480.001

7. Author(s)	8. Transport Canada File No.
Benjamin Bernier and David Youssef	2450-BP-14

9. Performing Organization Name and Address	10. PWGSC File No.
APS Aviation Inc. 6700 Cote-de-Liesse, Suite 102 Montreal, Quebec H4T 2B5 Canada	TOR-4-37170
	11. PWGSC or Transport Canada Contract No.: T8156-140243/001/TOR

12. Sponsoring Agency Name and Address	13. Type of Publication and Period Covered
Transportation Development Centre (TDC) Transport Canada 330 Sparks St., 25th Floor Ottawa, Ontario K1A 0N5 Canada	Final
	14. Project Officer: Antoine Lacroix

15. Supplementary Notes (Funding programs, titles of related publications, etc.)

Several research reports for testing of de/anti-icing technologies were produced for previous winters on behalf of Transport Canada. These are available from the Transportation Development Centre (TDC). Several reports were produced as part of this winter's research program. Their subject matter is outlined in the preface. This project was co-sponsored by the Federal Aviation Administration.

16. Abstract

The objective of this project was to collect freezing rain, freezing drizzle, ice pellets and mixed precipitation conditions data and to analyze the data in conjunction with previously collected data to evaluate the suitability of the current format of the HOT tables.

Precipitation data was acquired from instruments located at six stations in Quebec, Canada from the Meteorological Service of Canada.

The data collected in 2014-15 was added to the previously collected winter weather data. Analysis was conducted to characterize freezing rain/drizzle, ice pellets and mixed precipitation conditions, including freezing rain/drizzle mixed with snow, rain and ice pellets, and ice pellets mixed with snow, rain and freezing drizzle/rain.

It was concluded the current format of the HOT tables is suitable for snow, but that additional data is required to properly characterize freezing rain and freezing drizzle, ice pellets and mixed precipitation conditions. It is recommended that additional data be collected in subsequent years to enable the proper characterization of these conditions.

17. Key Words	18. Distribution Statement
Anti-icing, deicing, deicing fluid, holdover times, precipitation, aircraft, ground, test, winter, snow, ice pellets, mixed precipitation, weather data, frequency and distribution of deicing operations	Limited number of copies available from the Transportation Development Centre

19. Security Classification (of this publication)	20. Security Classification (of this page)	21. Declassification (date)	22. No. of Pages	23. Price
Unclassified	Unclassified	—	xvi, 64 apps	—

Transports Canada Transport Canada

FORMULE DE DONNÉES POUR PUBLICATION

1. Nº de la publication de Transports Canada	2. Nº de l'étude	3. Nº de catalogue du destinataire
TP 15320E	B14W	

4. Titre et sous-titre	5. Date de la publication
Winter Weather Impact on Holdover Time Table Format (1995-2015)	Août 2015
	6. Nº de document de l'organisme exécutant CM2480.001

7. Auteur(s)	8. Nº de dossier - Transports Canada
Benjamin Bernier et David Youssef	2450-BP-14

9. Nom et adresse de l'organisme exécutant	10. Nº de dossier - TPSGC
APS Aviation Inc. 6700 Côte-de-Liesse, Suite 102 Montréal, Québec H4T 2B5 Canada	TOR-4-37170
	11. Nº de contrat - TPSGC ou Transports Canada T8156-140243/001/TOR

12. Nom et adresse de l'organisme parrain	13. Genre de publication et période visée
Centre de développement des transports (CDT) Transport Canada 330 Sparks St., 25th Floor Ottawa, Ontario K1A 0N5 Canada	Final
	14. Agent de projet Antoine Lacroix

15. Remarques additionnelles (programmes de financement, titres de publications connexes, etc.)

Plusieurs rapports de recherche d'années antérieures sur les essais de technologies de dégivrage et d'antigivrage ont été produits pour le compte de Transports Canada. Ils sont disponibles du Centre de développement des transports (CDT). Le programme de cette saison hivernale a donné lieu plusieurs rapports. On trouvera dans la préface l'objet de ces rapports. Ce projet a était commandité conjointement avec la Federal Aviation Administration.

16. Résumé

L'objectif de la présente étude est de recueillir des données dans des conditions de pluie verglaçante, de bruine verglaçante, de granules de glace et de précipitation mixte et pour analyser les données conjointement avec les données recueillies antérieurement, afin d'évaluer la pertinence du modèle actuel de tableau de durées d'efficacité.

Les données météorologiques ont été recueillies à partir d'instruments du Service météorologique du Canada à six stations du Québec.

Les données recueillies au cours de l'hiver 2014-15 ont été combinées aux données météorologiques hivernales recueillies auparavant. Des analyses ont été menées pour définir les conditions de pluie et de bruine verglaçantes, de granules de glace et de conditions de précipitations mixtes, y compris la pluie et la bruine verglaçantes mêlées à de la neige, de la pluie et des granules de glace, et des granules de glace mêlés à de la neige, de la pluie ainsi que de la pluie verglaçante et de la bruine verglaçante.

Il a été conclu que le modèle actuel de tableau de durées d'efficacité convient à la neige, mais des données supplémentaires sont nécessaires afin de définir correctement la pluie verglaçante et la bruine verglaçante ainsi que les granules de glace et les conditions de précipitation mixte. Il est recommandé de recueillir davantage de données au cours des prochaines années, afin de mieux définir ces conditions.

17. Mots clés	18. Diffusion
Antigivrage, dégivrage, liquide de dégivrage, durées d'efficacité, précipitation, aéronef, sol, essai, hiver, neige, granules de glace, précipitation mixte, données météorologiques, fréquence et répartition des opérations de dégivrage	Le Centre de développement des transports dispose d'un nombre limité d'exemplaires.

19. Classification de sécurité (de cette publication)	20. Classification de sécurité (de cette page)	21. Déclassification (date)	22. Nombre de pages	23. Prix
Non classifiée	Non classifiée	—	xvi, 64 ann.	—

EXECUTIVE SUMMARY

Under contract to the Transportation Development Centre (TDC) of Transport Canada (TC), APS Aviation Inc. (APS) undertook a study to collect additional freezing rain, freezing drizzle, ice pellet and mixed precipitation conditions data, and to analyse the data in conjunction with the previously collected data to evaluate the suitability of the current format of the HOT tables.

In addition, information collected from other research related to winter weather data has been compiled and included in this report.

Description and Processing of Data

Precipitation data were acquired from instruments located at six stations in Quebec, Canada from the Meteorological Service of Canada (MSC).

The data were added to the previously collected winter weather data to evaluate the suitability of the current format of the HOT tables. Additional analysis was conducted to characterize mixed precipitation conditions, including freezing rain/drizzle mixed with snow, rain and ice pellets, and ice pellets mixed with snow, rain and freezing drizzle/rain.

Conclusions

Several conclusions can be drawn from the winter weather data that has been collected and analysed:

- Adequate data has been collected to determine that the precipitation rate and temperature breakdowns in the HOT tables for snow are suitable;
- A survey of winter operations at a number of airports worldwide has shown frost deicing is the second most frequent type of deicing operation, and therefore sufficient attention was given to investigating and substantiating frost holdover times;
- The limited data collected to date has shown that the temperature ranges and precipitation rates used for freezing rain and freezing drizzle in the HOT tables are suitable; and
- A methodology has been developed to evaluate ice pellet and mixed precipitation condition data, but more data is required to properly characterize these conditions and to develop appropriate allowance times.

Recommendations

Over the years there have been changes in the availability of the data from the weather stations currently used. Weather data from several stations has been discontinued. It is recommended that work be done to replenish the pool of data sources used in putting together this report.

Additionally, as a robust database for winter weather data spanning over 10 years has been established it is recommended that this report no longer be issued yearly. Going forward, this report should be completed every 2 years.

SOMMAIRE

En vertu d'un contrat avec le Centre de développement des transports (TDC) de Transports Canada (TC), APS Aviation Inc. (APS) a entrepris une étude pour recueillir des données additionnelles dans des conditions de pluie verglaçante, de bruine verglaçante, de granules de glace et de précipitation mixte et pour analyser les données conjointement avec les données recueillies antérieurement, afin d'évaluer la pertinence du modèle actuel de tableau de durées d'efficacité.

De plus, le présent rapport englobe aussi des données colligées à l'occasion d'autres recherches connexes.

Description et traitement des données

Des données de météorologie ont été obtenues à partir d'instruments du Service météorologique du Canada (SMC), situés à six stations du Québec, Canada.

Les données ont été combinées aux données météorologiques hivernales recueillies auparavant, dans le but d'évaluer la pertinence du format actuel des tableaux de durées d'efficacité. Des analyses additionnelles ont été menées pour définir les conditions de précipitations mixtes, y compris la pluie et la bruine verglaçante mêlées à la neige, à la pluie et aux granules de glace, ainsi que les granules de glace mêlées à la neige, à la pluie et à la pluie et la bruine verglaçante.

Conclusions

Plusieurs conclusions peuvent être tirées des treize années de données météorologiques hivernales recueillies et analysées :

- Suffisamment de données ont été recueillies pour établir que le taux de précipitation et les ventilations des températures des tableaux de durées d'efficacité pour la neige sont appropriés ;
- Une étude des opérations hivernales à un certain nombre d'aéroports dans le monde a démontré que le dégivrage dans des conditions de givre constitue la deuxième opération de dégivrage par ordre de fréquence et que, en conséquence, suffisamment d'attention devrait être portée à l'étude et à la justification des durées d'efficacité dans le givre ;
- La quantité limitée de données recueillies à ce jour a démontré que les plages de températures et les taux de précipitation utilisés dans les tableaux de durées d'efficacité pour la pluie verglaçante et la bruine verglaçante sont appropriés ; et

- Une méthodologie a été développée pour évaluer les données sur les conditions de granules de glace et de précipitations mixtes, mais davantage de données sont requises pour définir adéquatement ces conditions et développer des durées d'efficacité appropriées.

Recommandations

Au cours des années, la disponibilité des données a changé aux stations météorologiques utilisées. Les données météorologiques ont été discontinuées à plusieurs stations. Il est recommandé de voir à reconstituer la banque de sources de données qui ont servi à rédiger le présent rapport.

De plus, étant donné la mise en place d'une base de données météorologiques hivernales solide couvrant une période de plus de 10 ans, il est recommandé de ne plus produire ce rapport chaque année. À l'avenir, ce rapport devrait être produit tous les deux ans.

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GLOSSARY

AEA	Association of European Airlines
APS	APS Aviation Inc.
FAA	Federal Aviation Administration
HOT	Holdover Time
LOUT	Lowest Operational Use Temperature
LWE	Liquid Water Equivalent
MSC	Meteorological Service of Canada
NCAR	National Centre for Atmospheric Research
NRC	National Research Council Canada
OAT	Outside Air Temperature
PIWT	Propulsion and Icing Wind Tunnel
READAC	Remote Environmental Automatic Data Acquisition Concept
SAE	SAE International
TC	Transport Canada
TDC	Transportation Development Centre

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1. INTRODUCTION

Under winter precipitation conditions, aircraft are cleaned with a freezing point depressant fluid and protected against further accumulation by an additional application of such a fluid, possibly thickened to extend the protection time. Aircraft ground deicing had, until recently, never been researched and there is still little understanding of the hazard and of what can be done to reduce the risks posed by the operation of aircraft in winter precipitation conditions. This "winter operations contaminated aircraft - ground" program of research is aimed at overcoming this lack of knowledge.

Over the past several years, the Transportation Development Centre (TDC), Transport Canada (TC) has managed and conducted de/anti-icing related tests at various sites in Canada; it has also coordinated worldwide testing and evaluation of evolving technologies related to de/anti-icing operations with the co-operation of the US Federal Aviation Administration (FAA), the National Research Council Canada (NRC), Meteorological Service of Canada (MSC), several major airlines, and deicing fluid manufacturers. The TDC is continuing its research, development, testing and evaluation program.

Under contract to TDC, with financial support from the FAA, APS Aviation Inc. (APS) has undertaken research activities to further advance aircraft ground de/anti-icing technology. As part of the 2014-15 winter research program, APS conducted an analysis of freezing precipitation data collected between 1995-96 and 2014-15. This report contains the results of that analysis. It also encompasses some of the data presented in the 2013-14 TC report, TP 15268E, *Winter Weather Impact on Holdover Time Table Format (1995-2014)*, (1).

The work statement for this project is provided in Appendix A.

1.1 Background

Holdover time (HOT) tables are developed as guidelines to be used by pilots in aircraft departure planning under different winter weather conditions. Each HOT table is composed of cells, with each cell containing a HOT range for a specific temperature range and category of precipitation. The time range in each cell is defined by a “lower” time and an “upper” time; these values represent the failure time of the fluid at the upper and lower precipitation rates, respectively.

There are four standard types of fluid: Type I, Type II, Type III and Type IV. Aircraft are deiced using heated Type I and Type III fluids. Type II and Type IV fluids are anti-icing fluids that are applied following aircraft deicing, with Type II fluids being

thicker and more viscous than Type I or Type III fluids. Type IV fluids are designed to provide the utmost in HOT protection.

The Type I, Type III and Type II/IV HOT table formats have undergone significant change since the early 1990s. While the changes have been made primarily to improve and address safety concerns of many individuals and organizations involved in the deicing industry, a structured approach has not been taken for implementing changes. In fact, many of the changes have been made on a year-by-year basis at industry meetings. These changes have been typically minor in nature, but over a ten year period, the overall impact on HOTs is more significant. More recently, several changes have been made to improve and simplify the tables, while simultaneously ensuring that a high level of safety is maintained when the tables are used. Proposals for changes to the HOT tables have been made by TC, including new temperature breakdowns to better reflect winter precipitation conditions, expansion of the snow column to reflect its high usage, and removal of unnecessary HOT ranges in certain columns to result in single values.

To substantiate these changes, APS conducted a survey of airlines at several international airports. The survey provided information relating to the frequency of deicing operations as a function of weather condition and temperature. The detailed analysis of the results from the 3 year airline survey is presented in Section 3 of the 2003-04 TC report, TP 14375E, *Winter Weather Impact on Holdover Time Table Format (1995-2004)*, (2). A summary of the results is also given in Section 8 of this report.

1.2 Objectives

The primary objective of this project was to collect additional freezing rain, freezing drizzle, ice pellet and mixed precipitation conditions data in the winter of 2014-15, and to analyse the data in conjunction with the previously collected data to evaluate the suitability of the current format of the HOT tables.

Natural snow data were not collected in 2014-15, as it was determined following the winter of 2006-07 that adequate snow data had been collected.

1.3 Report Format

The following list provides descriptions of subsequent sections of this report:

a) Section 2 presents the data collection and data analysis methodologies;

b) Section 3 presents a summary of the natural snow data collected in previous years;

c) Section 4 presents an analysis of the freezing rain/drizzle data collected from 1997-98 to 2014-15;

d) Section 5 presents an analysis of freezing rain/drizzle data mixed with other forms of precipitation;

e) Section 6 presents an analysis of the ice pellets data collected from 2004-05 to 2014-15; and also analysis of ice pellets data mixed with other forms of precipitation;

f) Section 7 presents a summary of the winter operations survey data collected between 2000-01 and 2002-03;

g) Section 8 summarizes the historical, current and proposed changes to the format of the HOT tables;

h) Section 9 presents a brief summary of the frost and fog deposition rates measured in natural conditions;

i) Section 10 presents the conclusions; and

j) Section 11 presents the recommendations.

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2. METHODOLOGY

This section describes the methodology that has been used to collect all snow and freezing precipitation data over the past years. The data processing and analysis methodology is also presented in this section.

2.1 Sources of Data and Test Sites

The data in this report were collected from several sources and from a number of test sites.

2.1.1 Environment Canada Data

The precipitation events analysed in this report were extracted from the following:

a) The Dorval Remote Environmental Automatic Data Acquisition Concept (READAC) log for the years 1995 to 1999. The analysis using this instrumentation was discontinued after 1999 because a more improved system became available (see CR21X below);

b) The data logs from 1998 to 2015 for the two CR21X stations at Rouyn, and Pointe-au-Père (Mont-Joli);

c) The data log from the Montreal-Trudeau International Airport CR21X station from 1998 to 2008. Since 2008, MSC was unable to provide data for this station in a consistent usable format;

d) The data log from the Ancienne Lorette (Quebec City) CR21X station from 1998 to 2011. Since 2011, MSC was unable to provide data for this station in a consistent usable format;

e) The data logs for 2000 to 2015 from an additional CR21X station located in High Falls (near Ottawa, Ontario), and the data logs from 2000-14 from Frelighsburg (in Quebec's Eastern Townships). The data for these two stations became available in 2000. Since 2014, MSC was unable to provide data for the Frelighsburg (Sherbrooke) station in a consistent, usable format; and

f) An extensive hourly observation weather information dataset spanning between January 1, 1990 and December 31, 2001. This data were not used for the main analysis however it was used for some special analysis described in Section 2 of this report.

The data collected by APS from various sources extending back to the 1991-92 winter season are shown in Table 2.1. Each site where data were collected is identified on the map of Quebec shown in Figure 2.1. The data, starting with the 1995-96 winter season, is included in Appendix B, analysed and sorted by temperature ranges.

Table 2.1: Summary of Winter Weather Data

PROJECT #	YEAR	PLATE PAN	READAC YUL	CR21X						CITY OF MONTREAL (Fisher/Porter)	OMBROMETER THIES	TIPPING BUCKET	YYZ
				WUY (Rouyn)	WTQ (Dorval)	WQB (Québec)	WYQ (Pointe-au-Père)	WFQ (Frelighsburg)	XHF (High Falls)				
	1990/91	Test period										X[3]	
	1991/92	Test period								X[6]	X[3]		
	1992/93	Test period								X[6]	X[3]		
C1171	1993/94	Test period								X[1] (Three stations)	X[3] (Shielded)		
CM1222	1994/95	Test period	X[1]										
CM1283	1995/96	15 min	X[2]										X[4]
CM1338	1996/97	15 min	X[2]		X[5]								X[4]
CM1380	1997/98	5-15 min	X[2]	X[2]	X[2]	X[2]	X[2]						
CM1514	1998/99	5-15 min	X[2]	X[2]	X[2]	X[2]	X[2]						
CM1589	1999/00	5-15 min		X[2]	X[5]	X[2]	X[2]	X[2]	X[2]				
CM1680	2000/01	5-15 min		X[2]	X[2]	X[2]	X[2]	X[2]	X[2]				
CM1680(01-02)	2001/02	5-15 min		X[2]	X[2]	X[2]	X[2]	X[2]	X[2]				
CM1747	2002/03	5-15 min		X[2]	X[2]	X[2]	X[2]	X[2]	X[2]				
CM1892	2003/04	5-15 min		X[2]	X[2]	X[2]	X[2]	X[2]	X[2]				
CM1892	2004/05	5-15 min		X[2]	X[2]	X[2]	X[2]	X[2]	X[2]				
CM2020	2005/06	5-15 min		X[2]	X[2]	X[2]	X[2]	X[2]	X[2]				
CM2020	2006/07	5-15 min		X[2]	X[2]	X[2]	X[2]	X[2]	X[2]				
CM2103	2007/08	5-15 min		X[2]	X[7]	X[2]	X[2]	X[2]	X[2]				
CM2169	2008/09	5-15 min		X[2]	X[7]	X[2]	X[2]	X[2]	X[2]				
CM2169	2009/10	5-15 min		X[2]	X[7]	X[2]	X[2]	X[7]	X[2]				
CM2169	2010/11	5-15 min		X[2]	X[7]	X[2]	X[2]	X[7]	X[2]				
CM2265	2011/12	5-15 min		X[2]	X[7]	X[7]	X[2]	X[2]	X[2]				
CM2265	2012/13	5-15 min		X[2]	X[7]	X[7]	X[2]	X[2]	X[2]				
CM2265	2013/14	5-15 min		X[2]	X[7]	X[7]	X[2]	X[7]	X[2]				
CM2265	2014/15	5-15 min		X[2]	[7]X	X[7]	X[2]	X[7]	X[2]				

[1] Data analysed for Transport Canada in 1996.
[2] Data used for this report.
[3] Unusable data - precipitation rate determined by this gauge was always lower than other instruments.
[4] Analysis completed by AES at YYZ.
[5] Unusable data - scattered data (gauge was not shielded).
[6] Data archived.
[7] Data not supplied by MSC

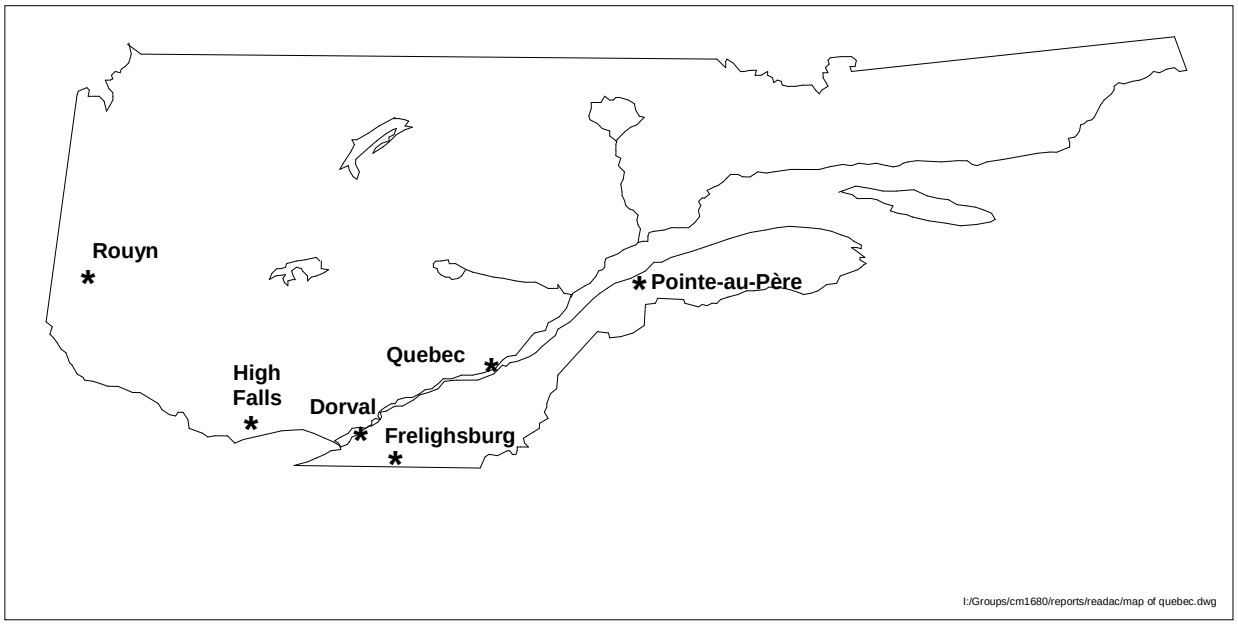

Figure 2.1: Map of Precipitation Gauge Locations

Unless otherwise specified, all precipitation rates analysed in this report were extracted from the CR21X data logs received from the MSC for each of the six Quebec weather stations that are part of this study.

Two similar studies were conducted. One study was conducted by APS in the 1993-94 and 1994-95 winters using data collected from three weather stations located around Montreal. The MSC carried out a similar study in 1995 using data collected at the Lester B. Pearson International Airport in Toronto. Overall, the data sets from MSC and APS were found to be similar enough to merit a comparison for temperature ranges above -7°C. Below that temperature, the MSC data contains no high rate precipitation points. These two studies can be found in Appendices C and D of the TC report, TP 13993E*, Impact of Winter Weather on Holdover Time Table Format (1995-2002)*, (3).

2.1.1.1 Weather Information Database – La Grande and Montreal

An extensive dataset was acquired by APS from the MSC. The hourly data contains weather observations for two meteorological stations in Quebec, Montreal and La Grande, from January 1, 1990 to December 31, 2001. The data contains observations of the following parameters: visibility, wind speed, wind direction, dew point, relative humidity, atmospheric pressure, and cloud opacity, cloud amount and weather condition.

This dataset of weather information was used for different projects. The specific use of the dataset in each project is described in the TC report, TP 14444E, *Winter Weather Impact on Holdover Time Table Format (1995-2005)*, (4).

2.1.1.2 MSC Data from 1990 to 2001

APS acquired an extensive hourly observation weather information dataset from MSC. The observation period was from January 1, 1990 to December 31, 2001. Among other parameters, the data contains observations related to the weather condition. The dataset for Montreal was analysed in an attempt to determine the frequency of ice pellet conditions during typical winter months. The months of October to April were selected for the analysis. The results are presented in Table 2.2.

Table 2.2: Frequency of Occurrence of Ice Pellets between 1990 and 2001 (Montreal, Quebec)

		#	%
1.	Hourly Observations under Precipitation Conditions	21,343	100.0
2.	Ice Pellet Observations *(ice pellets and ice pellet showers only)*	36	0.2
3.	Combined Ice Pellet Observations *(ice pellets mixed with other precipitation types excluding observations in point 2.)*	376	1.8
4.	Total Ice Pellet Precipitation	412	1.9

The information presented in Table 2.2 was gathered exclusively from the 12 year dataset of hourly observations for Montreal, and does not include the CR21X data collected and analysed elsewhere in this report.

As can be seen in Table 2.2, ice pellet occurrences accounted for less than two percent of all precipitation conditions during winter months. Also, the ice pellet conditions occurred mostly mixed with other precipitation types, typically freezing rain, freezing drizzle and snow. The dataset provided by MSC does not contain information with respect to which was the predominant weather condition during these mixed precipitation events. Ice pellets as a standalone precipitation condition constituted only about 10 percent of the total time ice pellet conditions occurred.

2.1.2 Journal Report on Ice Pellets

An article published in the Weather and Forecasting Journal was reviewed to further investigate the characteristics of ice pellets. The article, *An Analysis of Freezing Rain, Freezing Drizzle, and Ice Pellets Across the United States and Canada: 1976-1990* (5) analyses 14 years of ice pellet data collected from stations across North America. Data were collected in 11 stations in the United States and 10 stations in Canada.

According to the analysis presented in the article, the majority of ice pellets (83 percent) occur in North America during the months of November to March. Ice pellets occur with the highest frequency in the northeast, from New York to Newfoundland and from the Great Lakes to the east coast. In this region, the mean annual days with ice pellets ranges from 7 to 13 and the mean annual ice pellet total duration ranges from 10 to 30 hours.

The analysis also concludes that the majority of ice pellet events are relatively short in duration: 65 percent of all ice pellet events last for one hour or less, and 84 percent last for two hours or less. Furthermore, ice pellets generally occur at warmer temperatures; approximately 60 percent of all events occurred at 0ºC or above.

2.2 Equipment

Over the years, both the READAC and CR21X stations have been used to measure precipitation rates. The READAC precipitation gauge consists of a bucket partially filled with an antifreeze compound so that it effectively captures precipitation. A weighing transducer shaft provides instantaneous displacement values of the bucket in terms of millimetres of precipitation. This shaft displacement is transmitted every 2.5 seconds and averaged every minute in an attempt to eliminate spurious data caused by gusts of wind and temperature-induced contraction and expansion of the sensor. The READAC instrument has a resolution of 0.5 mm (5 g/dm²). In the 2003-04 winter, the use of the READAC equipment at Trudeau Airport was discontinued by the MSC.

The CR21X station operates on the same principle as the READAC station and has an accuracy of 0.1 mm (1 g/dm²). The station measures precipitation with a Fisher Porter precipitation gauge and the readings are logged with a CR21X data logger. A more detailed description of the CR21X equipment can be found in Appendix C.

Precipitation rates tend to fluctuate rapidly during events. The weight resolution of the READAC stations is less accurate in measuring rapid changes compared to the CR21X station. The data from the CR21X station therefore required less smoothing

before it could be interpreted. The increased resolution of the CR21X weighing transducer allows better observation of short periods with heavy precipitation.

For this project, the measuring instruments used to record weather precipitation data were owned and operated by the MSC, and these instruments were calibrated according to their standards. The data were acquired for the purpose of this project.

2.3 Description of Analytical Methods

Precipitation rate data were averaged at intervals that correspond to three specified periods typically used in the HOT tables: 6 minutes for Type I fluids, 20 minutes for Type II fluids, and 35 minutes for Type IV fluids. For freezing rain/drizzle and ice pellets, data were classified into three ranges: *Above 0°C, 0 to -3°C* and *-3 to -10°C*.

Precipitation events were tracked from 1995 to 2015 using the Monthly Meteorological Data Summary provided by the MSC. This summary includes meteorological data such as temperature, wind speed and direction, dew point temperature, and humidity on an hourly basis, and precipitation type and total accumulation on a daily basis. An example of the Monthly Meteorological Summary for Montreal is included in Appendix D. The last page of the summary (D-6) states whether there was precipitation on a particular day and the first page (D-1) provides the total precipitation accumulation for each day. Based on this information, the precipitation and temperature data were extracted from READAC logs on a minute-by-minute basis and added to a database. The CR21X data were treated in a similar way.

Starting in the winter of 2004-05, the number of Monthly Meteorological Data Summaries produced by MSC was reduced as the data were made available on the MSC website. As a result, for the 2004-05 winter season Monthly Summaries were used for Montreal, Quebec and Pointe-au-Père (Mont-Joli), and the information posted online was used for Rouyn, Frelighsburg and High Falls. In the winter of 2005-06, the Monthly Meteorological Data Summary for Pointe-au-Père became unavailable. The information posted online for this station was used. Information pertaining to Frelighsburg and High Falls was limited, so Sherbrooke and Ottawa data were used instead.

Periods of precipitation were identified using either the MSC summaries or the weather database available online, and precipitation accumulation data were added to the database along with ambient air temperatures. The temperatures were then linearly interpolated throughout the hour on a minute-by-minute basis.

Precipitation rates were calculated in a two-step procedure.

First, the total precipitation for each event was linearized to produce a smooth curve. This procedure is described in Section 2.4.

Secondly, precipitation rates were calculated according to the linearized total accumulation values and the time between readings. This procedure is described in Section 2.5.

2.4 Linearization of Cumulative Precipitation Weight Data

Using an algorithm developed by APS, the total precipitation for each event was linearized to produce a smooth curve. Table 2.3, demonstrating a typical snowfall, shows an example of how the algorithm linearizes data. Figure 2.2 shows an output from the CR21X data logger recording the output from the precipitation gauges and the linearized data for a typical precipitation event. The precipitation gauge output, sensitive to 1 g/dm², is plotted versus time to establish the periods of snowfalls.

As seen in Figure 2.2, intervals when precipitation was interrupted for long periods of time were excluded from the analysis. Subsequent events were treated in a similar manner. The first and last indications of a precipitation event (first and last 1 g/dm²) were excluded due to uncertainty about the precise start and end time of the event.

Periods of low-rate precipitation might have been overlooked due to long interruptions in bucket weight changes. It is difficult to establish whether these weight changes were due to constant low rate precipitation or long periods with no precipitation and short intervals of higher precipitation. The start and end of a precipitation event are difficult to establish because precipitation may start and end gradually at slow rates or abruptly at high rates.

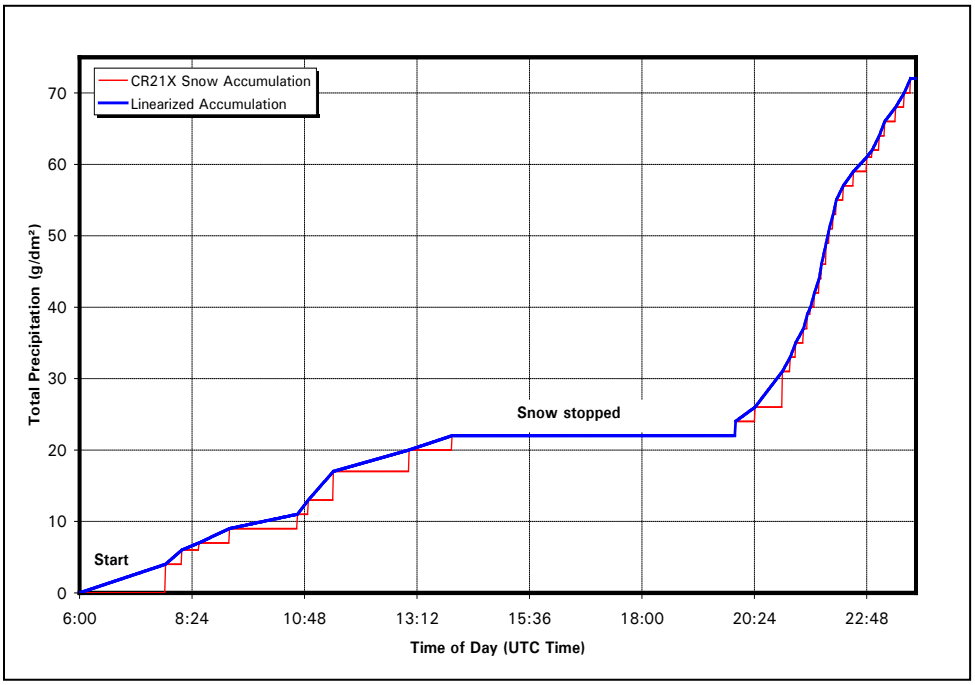

Figure 2.2: CR21X Precipitation Gauge Cumulative and Linearized Precipitation

Table 2.3: Sample of Linearized READAC Data

Location	Date	UTC Time	Temp (°C)	Type of Precip.	Total Snow Accumulation (g/dm²)	Linearized Total Snow Accumulation (g/dm²)
YUL	14/12/1995	21:16	-11.8	S-	**40**	**40**
YUL	14/12/1995	21:17	-11.7	S-	**40**	**40.16**
YUL	14/12/1995	21:18	-11.6	S-	**40**	**40.31**
YUL	14/12/1995	21:19	-11.6	S-	**40**	**40.47**
YUL	14/12/1995	21:20	-11.6	S-	**40**	**40.63**
YUL	14/12/1995	21:21	-11.6	S-	**40**	**40.78**
YUL	14/12/1995	21:22	-11.6	S-	**40**	**40.94**
YUL	14/12/1995	21:23	-11.5	S-	**40**	**41.09**
YUL	14/12/1995	21:24	-11.6	S-	**40**	**41.25**
YUL	14/12/1995	21:25	-11.6	S-	**40**	**41.41**
YUL	14/12/1995	21:26	-11.4	S-	**40**	**41.56**
YUL	14/12/1995	21:27	-11.4	S-	**40**	**41.72**
YUL	14/12/1995	21:28	-11.5	S-	**40**	**41.88**
YUL	14/12/1995	21:29	-11.5	S-	**40**	**42.03**
YUL	14/12/1995	21:30	-11.4	S-	**40**	**42.19**
YUL	14/12/1995	21:31	-11.4	S-	**40**	**42.34**
YUL	14/12/1995	21:32	-11.4	S-	**40**	**42.50**
YUL	14/12/1995	21:33	-11.4	S-	**40**	**42.66**
YUL	14/12/1995	21:34	-11.4	S-	**40**	**42.81**
YUL	14/12/1995	21:35	-11.4	S-	**40**	**42.97**
YUL	14/12/1995	21:36	-11.3	S-	**40**	**43.13**
YUL	14/12/1995	21:37	-11.3	S-	**40**	**43.28**
YUL	14/12/1995	21:38	-11.4	S-	**40**	**43.44**
YUL	14/12/1995	21:39	-11.4	S-	**40**	**43.59**
YUL	14/12/1995	21:40	-11.3	S-	**40**	**43.75**
YUL	14/12/1995	21:41	-11.3	S-	**40**	**43.91**
YUL	14/12/1995	21:42	-11.3	S-	**40**	**44.06**
YUL	14/12/1995	21:43	-11.3	S-	**40**	**44.22**
YUL	14/12/1995	21:44	-11.2	S-	**40**	**44.38**
YUL	14/12/1995	21:45	-11.2	S-	**40**	**44.53**
YUL	14/12/1995	21:46	-11.2	S-	**40**	**44.69**
YUL	14/12/1995	21:47	-11.2	S-	**40**	**44.84**
YUL	14/12/1995	21:48	-11.2	S-	**45**	**45.00**
YUL	14/12/1995	21:49	-11.2	S-	**45**	**45.29**
YUL	14/12/1995	21:50	-11.2	S-	**45**	**45.59**
YUL	14/12/1995	21:51	-11.2	S-	**45**	**45.88**
YUL	14/12/1995	21:52	-11.1	S-	**45**	**46.18**
YUL	14/12/1995	21:53	-11.1	S-	**45**	**46.47**
YUL	14/12/1995	21:54	-11.1	S-	**45**	**46.76**
YUL	14/12/1995	21:55	-11.1	S-	**45**	**47.06**
YUL	14/12/1995	21:56	-11.1	S-	**45**	**47.35**
YUL	14/12/1995	21:57	-11.1	S-	**45**	**47.65**
YUL	14/12/1995	21:58	-11.1	S-	**45**	**47.94**
YUL	14/12/1995	21:59	-11.0	S-	**45**	**48.24**
YUL	14/12/1995	22:00	-11.0	S-	**45**	**48.53**
YUL	14/12/1995	22:01	-11.0	S-	**45**	**48.82**
YUL	14/12/1995	22:02	-11.0	S-	**45**	**49.12**
YUL	14/12/1995	22:03	-11.0	S-	**45**	**49.41**
YUL	14/12/1995	22:04	-10.9	S-	**45**	**49.71**
YUL	14/12/1995	22:05	-10.8	S-	**50**	**50.00**

2.5 Calculation of Precipitation Rates

Precipitation rates were calculated from the weather data on a minute-by-minute basis using a moving average based on 6-, 20-, and 35-minute intervals.

The following example, presented in a previous version of this report, TC report, TP 14934E, *Winter Weather Impact on Holdover Time Table Format (1995-2009)*, (6) is for a snow event. However, the same methodology was employed in the calculation of precipitation rates for freezing precipitation and ice pellets.

Table 2.4 shows minute-by-minute READAC data at Trudeau Airport for a 49-minute period on December 14, 1995. Also shown are the 6-minute, 20-minute, and 35-minute averages computed using the linearized accumulation. The average snow rates, used as data points, were calculated by taking the snow accumulation during a specific time interval and dividing it by the interval. The three intervals used for this analysis are represented by brackets in the column next to "Linearized Total Snow Accumulation" in Table 2.4. The average snow rate was recalculated every minute by moving the brackets down at one-minute intervals.

For each interval, the rate was calculated every minute using the following method:

$$Rate_i = \frac{W_i - W_{i-1}}{\Delta time}$$

Where:

- $Rate_i$ is the rate at a given time;
- W_i is the linearized bucket weight at that time;
- W_{i-1} is the linearized bucket weight at a one-time interval before the given time; and
- $\Delta time$ is the length of the time interval (6, 20, or 35 minutes).

A temperature was associated with the rate, based on the time and day at which the rate was measured. All rate and temperature data were added to a database that contained calculated precipitation rates classified by ambient temperature for all sites included in the study. The database was then sorted by temperature range (above 0°C, 0 to -3°C, -3 to -7°C, -7 to -14°C and -14 to -25°C) and the probability for each precipitation rate at each temperature range was calculated using histograms and cumulative percentages.

Table 2.4: Sample READAC Data and Analysis

Location	Date	UTC Time	Temp (°C)	Type of Precip.	Total Snow Accumulation (g/dm²)	Linearized Total Snow Accumulation (g/dm²)		Precipitation Rate (g/dm²/h) Moving Average Intervals		
								6 min	20 min	35 min
YUL	14/12/1995	21:16	-11.8	S-	40	40.00		(a)	(b)	(c)
YUL	14/12/1995	21:17	-11.7	S-	40	40.16		9.38	9.38	13.32
YUL	14/12/1995	21:18	-11.6	S-	40	40.31		9.38	9.38	13.56
YUL	14/12/1995	21:19	-11.6	S-	40	40.47		9.38	9.38	13.79
YUL	14/12/1995	21:20	-11.6	S-	40	40.63		9.38	9.38	14.03
YUL	14/12/1995	21:21	-11.6	S-	40	40.78		9.38	9.38	14.27
YUL	14/12/1995	21:22	-11.6	S-	40	40.94		9.38	9.38	14.50
YUL	14/12/1995	21:23	-11.5	S-	40	41.09		9.38	9.38	14.74
YUL	14/12/1995	21:24	-11.6	S-	40	41.25		9.38	9.38	14.97
YUL	14/12/1995	21:25	-11.6	S-	40	41.41		9.38	9.38	15.21
YUL	14/12/1995	21:26	-11.4	S-	40	41.56		9.38	9.38	15.45
YUL	14/12/1995	21:27	-11.4	S-	40	41.72		9.38	9.38	15.68
YUL	14/12/1995	21:28	-11.5	S-	40	41.88		9.38	9.38	12.92
YUL	14/12/1995	21:29	-11.5	S-	40	42.03		9.38	9.79	13.16
YUL	14/12/1995	21:30	-11.4	S-	40	42.19		9.38	10.20	13.39
YUL	14/12/1995	21:31	-11.4	S-	40	42.34		9.38	10.62	13.48
YUL	14/12/1995	21:32	-11.4	S-	40	42.50		9.38	11.03	13.57
YUL	14/12/1995	21:33	-11.4	S-	40	42.66		9.38	11.4	13.66
YUL	14/12/1995	21:34	-11.4	S-	40	42.81		9.38	11.[illegible]	13.75
YUL	14/12/1995	21:35	-11.4	S-	40	42.97		[illegible]	12.27	13.84
YUL	14/12/1995	21:36	-11.3	S-	40	43.13		9.38	12.68	13.93
YUL	14/12/1995	21:37	-11.3	S-	40	43.28		9.38	13.10	14.02
YUL	14/12/1995	21:38	-11.4	S-	40	43.44		9.38	13.51	14.11
YUL	14/12/1995	21:39	-11.4	S-	40	43.59		9.38	13.92	14.20
YUL	14/12/1995	21:40	-11.3	S-	40	43.75		9.38	14.34	14.29
YUL	14/12/1995	21:41	-11.3	S-	40	43.91		9.38	14.75	14.38
YUL	14/12/1995	21:42	-11.3	S-	40	44.06		9.38	15.17	14.46
YUL	14/12/1995	21:43	-11.3	S-	40	44.22		10.75	15.58	14.55
YUL	14/12/1995	21:44	-11.2	S-	40	44.38		12.13	15.99	14.64
YUL	14/12/1995	21:45	-11.2	S-	40	44.53		13.51	16.41	14.73
YUL	14/12/1995	21:46	-11.2	S-	40	44.69		14.89	16.56	14.82
YUL	14/12/1995	21:47	-11.2	S-	40	44.84		16.27	16.72	14.91
YUL	14/12/1995	21:48	-11.2	S-	45	45.00		17.65	16.88	15.00
YUL	14/12/1995	21:49	-11.2	S-	45	45.29		17.65	16.62	14.85
YUL	14/12/1995	21:50	-11.2	S-	45	45.59		17.65	16.36	14.71
YUL	14/12/1995	21:51	-11.2	S-	45	45.88		17.65	16.10	14.56
YUL	14/12/1995	21:52	-11.1	S-	45	46.18		17.65	15.85	14.41
YUL	14/12/1995	21:53	-11.1	S-	45	46.47		17.65	15.59	14.26
YUL	14/12/1995	21:54	-11.1	S-	45	46.76		17.65	15.33	14.12
YUL	14/12/1995	21:55	-11.1	S-	45	47.06		17.65	15.07	14.18
YUL	14/12/1995	21:56	-11.1	S-	45	47.35		17.65	14.82	14.25
YUL	14/12/1995	21:57	-11.1	S-	45	47.65		17.65	14.56	14.32
YUL	14/12/1995	21:58	-11.1	S-	45	47.94		17.65	14.30	14.39
YUL	14/12/1995	21:59	-11.0	S-	45	48.24		17.65	14.04	14.45
YUL	14/12/1995	22:00	-11.0	S-	45	48.53		16.79	13.79	14.52
YUL	14/12/1995	22:01	-11.0	S-	45	48.82		15.93	13.53	14.59
YUL	14/12/1995	22:02	-11.0	S-	45	49.12		15.07	13.27	14.66
YUL	14/12/1995	22:03	-11.0	S-	45	49.41		14.22	13.01	14.72
YUL	14/12/1995	22:04	-10.9	S-	45	49.71		13.36	12.76	14.79
YUL	14/12/1995	22:05	-10.8	S-	50	50.00		12.50	12.50	14.86

(a) = (40.94 - 40.00)*60 / 6
(b) = (43.13 - 40.00)*60 / 20
(c) = (45.88 - 40.00)*60 / 35

The snow weather data were graphed in two formats. In one format, the number of snow precipitation events was plotted against the precipitation rates (see Figure 2.3). The other format (Figure 2.4) plots the cumulative probability of snow over all possible precipitation rates. The figures shown correspond to the temperature range of -3°C to -7°C for 20-minute rate calculations. Both plots used the corresponding period to calculate average precipitation rates.

The histogram in Figure 2.3 indicates that snow events with low precipitation rates occurred much more frequently than those with high precipitation rates for the temperature range shown.

The cumulative probability in Figure 2.4 indicates that over 97 percent of all the natural snow events in the data had precipitation rates below 25 g/dm^2/h for 20-minute rate intervals.

A complete set of plots for all temperature ranges and rate durations for freezing rain/drizzle is included in Appendix B. As previously mentioned, this report encompasses all the data presented in the past reports on this subject. For consistency purposes, the data in Appendix B is presented using the same temperature ranges used in the previous versions of this report. Moreover, changing the temperature breakdowns to reflect the values in the TC HOT table for Type I fluids (i.e. change -7°C to -6°C), does not produce a major change in the charts. These temperature ranges will also be used in the remainder of this section.

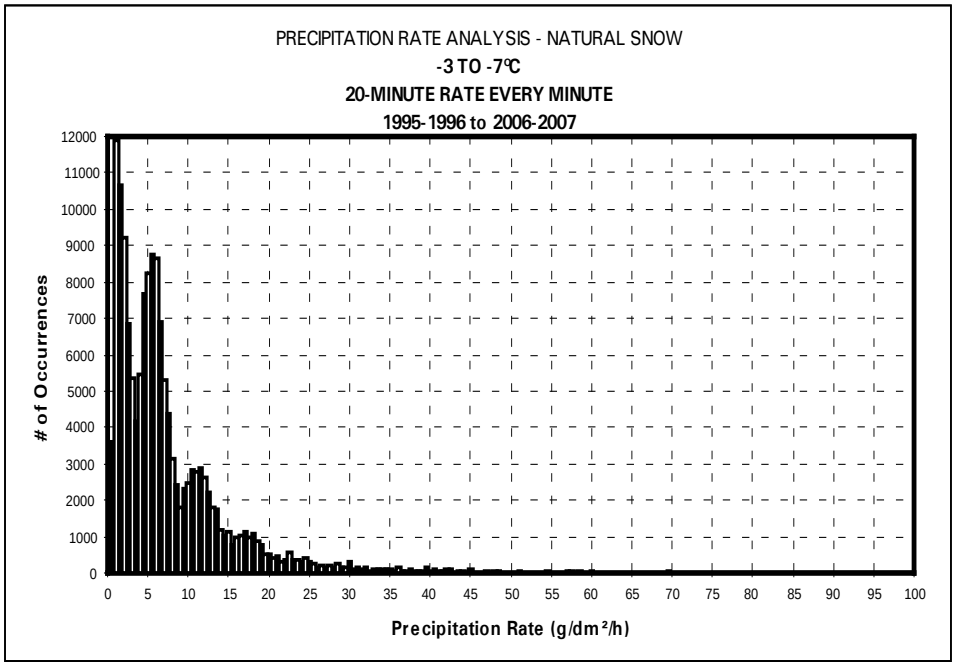

Figure 2.3: Example: READAC and CR21X Analysis – Natural Snow Histogram

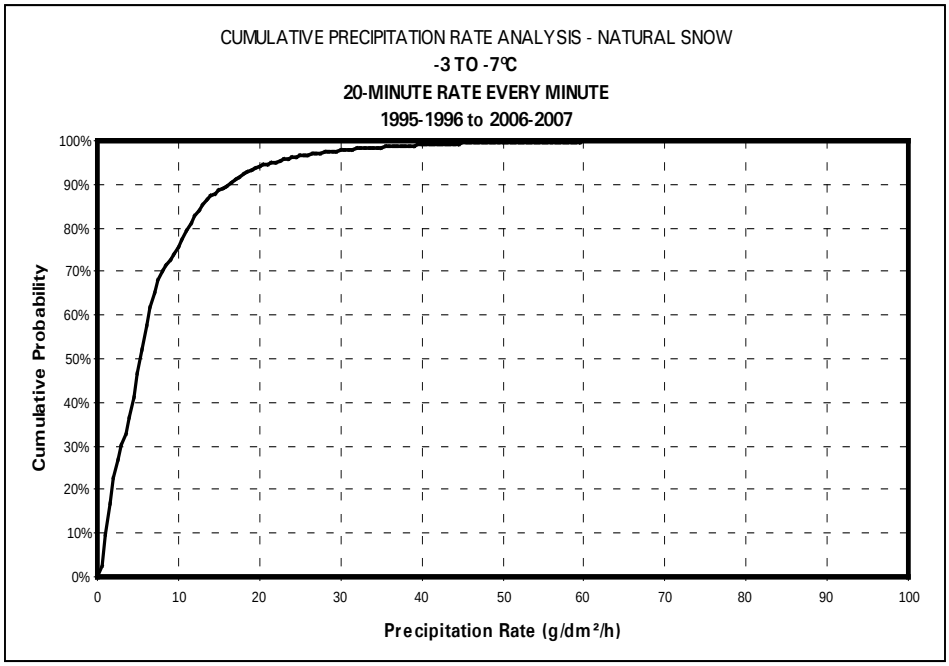

Figure 2.4: Example: READAC and CR21X Analysis – Natural Snow Cumulative Probability

2.6 Validity of Gauges for Recording Precipitation Data

The objective of this section is to evaluate and compare precipitation rates measured with the automated gauge used for this study to the plate pans used for measuring rates for endurance times.

Plate pan data has been collected at the APS test site since 1999 to validate the automatic gauges used by MSC. Two pans were placed at a 10 degree angle on a test stand approximately thirty meters away from the precipitation gauge. The rate of precipitation is derived from the change in weight of the pan as it is exposed to the precipitation versus the time of exposure. The rates were recorded at the end of each time interval, and each final value is based on the average to two simultaneous pan measurements.

Section 2.2.3 of the TC report, TP 14777E *Winter Weather Impact on Holdover Time Table Format (1995-2007)*, (7) references the results of this data collection.

3. NATURAL SNOW

From the winter of 1995-96 to the winter of 2006-07 APS undertook a study to evaluate snowfall data to confirm the suitability of precipitation and temperature ranges used for holdover time evaluation. A total of 8,497 hours of storm data points were developed from precipitation gauge logs for natural snow. Data were acquired from the MSC from instruments located at Montreal's Trudeau Airport and five other stations in the province of Quebec, Canada.

The natural snow database showed that current snow precipitation rate limits of 10 and 25 g/dm^2/h are valid for moderate snow. The data analysis concluded that the column representing moderate snow in the HOT table encompasses only 23.5 percent of all snow events. This led to the introduction of a *light snow* column in the Type I HOT table for precipitation rates of 4 to 10 g/dm^2/h. This column was used starting in the 2002-03 winter season.

Most snowfall events occur at rates less than 4 g/dm^2/h. In order to use the longer HOT provided in the light snow column, introduction of a *very light snow* column in the Type I HOT table was recommended and accepted at the 2003 Society of Automotive Engineers (SAE International) G-12 Holdover Time Subcommittee meeting. It was also concluded that the Type I HOT table temperature row of *-3°C to -10°C* should be replaced by two new temperature bands, *below -3°C to -6°C* and *below -6°C to -10°C*. Selection of -6ºC as the temperature break was found to be the most operationally advantageous.

Following the winter of 2006-07, it was decided that adequate snow data had been collected and that the focus of this project would shift towards other forms of precipitation. Because no new snow data were collected since the winter of 2006-07, no snow data or analysis is presented in this year's report. However, the complete 1995-96 to 2006-07 snow data set and corresponding analysis can be found in the TC report, TP 14777E, *Winter Weather Impact on Holdover Time Table Format (1995-2007)* (7).

Although natural snow data were not collected in the winters 2007-08 to 2014-15, data continued to be collected for other forms of winter precipitation, such as freezing rain, freezing drizzle and ice pellets. These forms of precipitation occur much less frequently than snow and therefore the amount of data that has been collected to date is much less. Data and analysis of these forms of precipitation are presented in Sections 4, 5, and 6.

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4. FREEZING RAIN/DRIZZLE

An already extensive dataset has been collected with freezing rain and freezing drizzle, however it was decided to continue collecting data of this type in 2014-15. This is because more data is required to properly study freezing rain/drizzle mixed with other precipitation types. This will be analysed in Section 5. The freezing rain/drizzle data collected since the winter of 1996-97 is presented in this section.

The data presented in this section includes "pure" freezing rain/drizzle data points and data points of freezing rain/drizzle mixed with other precipitation types.

When freezing rain/drizzle data were first collected, the significance of the mixed data points was not completely understood; however, mixed precipitation conditions have been given more attention in recent years. For this reason, further analysis on the freezing rain/drizzle data points that are mixed with other forms of precipitation is presented in Section 5.

4.1 Data Collected

From 1996-97 to 2014-15, a total of 49,810 data points were collected for freezing rain/drizzle conditions. These represent approximately 830 hours of light freezing rain/drizzle data. Freezing rain/drizzle data were developed from CR21X and READAC logs. The 1998 ice storm data is included in this dataset. The data is included in Appendix B.

The distribution of these data points by year is illustrated in Table 4.1. The distribution of data points is shown by temperature range in Table 4.2 and by temperature in Figure 4.1.

4.2 Probability of Precipitation Rates by Temperature

The 95th percentile for two temperature ranges is shown in Table 4.3 for freezing rain/drizzle. The rates in this table represent the rate below which 95 percent of all freezing rain/drizzle occurred in a specific temperature range for a given rate measurement duration. For example, in the temperature range of *0 to -3°C* for duration of 20 minutes, the 95th percentile is 27 g/dm^2/h. This indicates that 95 percent of the 20-minute rates recorded between *0°C to -3°C* were equal to or less than 27 g/dm^2/h.

Table 4.1: Distribution of Freezing Rain/Drizzle Data Points by Year

Year	# of Data Points	%
1996-00	13,381	27.0
2000-01	785	1.6
2001-02	5,465	11.0
2002-03	3,859	7.8
2003-04	2,229	4.5
2004-05	1,503	3.0
2005-06	3,490	7.1
2006-07	3,005	6.1
2007-08*	894	1.8
2008-09*	1,773	3.6
2009-10	3,015	6.1
2010-11	3,279	6.6
2011-12	2,135	4.3
2012-13	1,233	2.5
2013-14	1,625	3.3
2014-15	1,814	3.7
Total	**49,485**	**100**

**** Data points of Pure Freezing Rain/Drizzle Only***

Table 4.2: Distribution of Freezing Rain/Drizzle Data Points by Temperature

Temperature Range	# of Data Points	%
Above 0ºC	7,796	16.4
Between 0 and -3ºC	24,254	50.9
Between -3 and -6ºC	12,649	26.5
Between -6 and -10ºC	4,188	8.8
Below -10ºC	598	1.3
Total	**49,485**	**104**

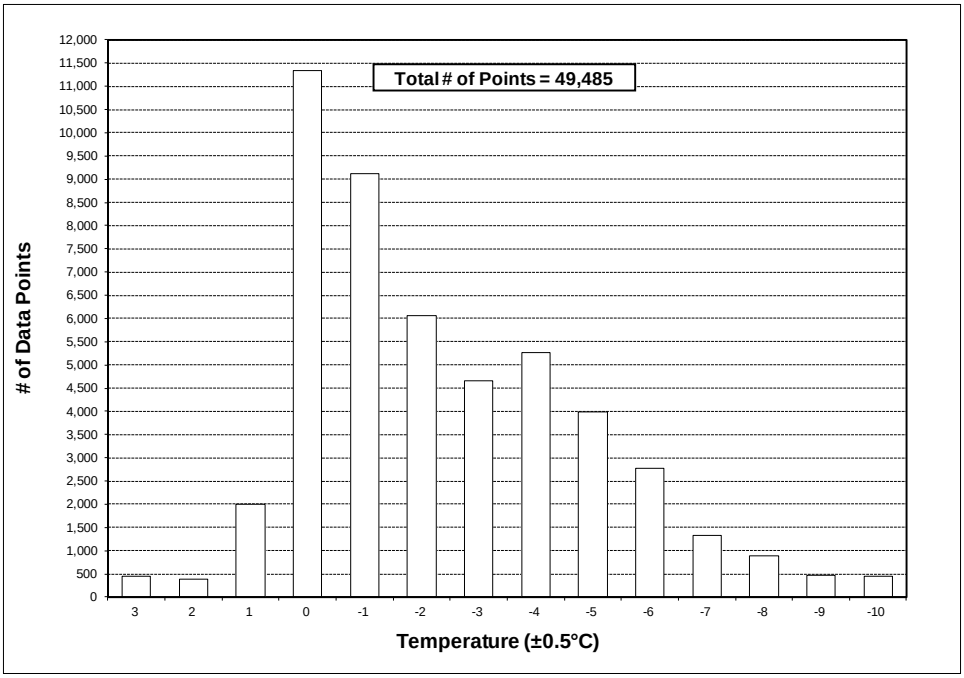

Figure 4.1: Distribution of 1996-97 to 2014-15 Freezing Rain/Drizzle Data Points by Temperature

Table 4.3: 95th Percentile in Each Temperature Range – Freezing Rain/Drizzle

Temperature Range	95th Percentile Precipitation Rate ($g/dm^2/h$)		
	6 min	20 min	35 min
0 to -3°C	30	27	26
-3 to -10°C	25	24.5	24

4.3 Probability of Precipitation Rates by Holdover Time Table Temperature Ranges

To evaluate the appropriateness of the freezing rain/drizzle temperature divisions in the HOT tables, a distribution table was created with the freezing rain/drizzle dataset (4,485 data points). The data were divided by 1°C temperature intervals and sorted into the precipitation rate ranges used in the HOT tables. The resulting table is shown in Table 4.4. Appendix E contains the same data, but with precipitation rate increments of 1 $g/dm^2/h$.

The results were merged as necessary to give the probability of freezing rain/drizzle occurring in each temperature range in the Type I and Type II/IV HOT tables. These

results are shown in Table 4.5 and Table 4.6. The tables show that the majority (64.9 percent) of freezing rain/drizzle occurs at temperatures of -3°C and above, and only 1.1 percent occurs below -10°C. This indicates the current temperature divisions in the HOT tables are suitable.

Table 4.4: Distribution (%) of Freezing Rain/Drizzle Data Points – 1996-97 to 2014-15

	RATE OF PRECIPITATION (g/dm^2/h)							
TEMP (°C)	**0 to 5**	**5 to 13**	**13 to 25**	**25 to 50**	**50 to 75**	**75+**	**Total**	**Cumulative**
above 0	7.4%	3.1%	3.7%	1.4%	0.1%	0.1%	**15.7%**	**15.7%**
0 to -1	13.0%	5.3%	4.7%	1.5%	0.2%	0.0%	**24.7%**	**40.5%**
-1 to -2	7.1%	2.5%	1.8%	0.5%	0.1%	0.0%	**11.9%**	**52.4%**
-2 to -3	6.7%	2.8%	2.3%	0.5%	0.1%	0.0%	**12.5%**	**64.9%**
-3 to -4	4.9%	2.7%	2.3%	0.6%	0.0%	0.0%	**10.6%**	**75.5%**
-4 to -5	4.7%	2.2%	1.3%	0.1%	0.0%	0.0%	**8.4%**	**83.8%**
-5 to -6	3.2%	1.8%	1.5%	0.2%	0.0%	0.0%	**6.7%**	**90.6%**
-6 to -7	2.1%	0.9%	1.2%	0.3%	0.1%	0.0%	**4.6%**	**95.2%**
-7 to -8	0.8%	0.2%	0.4%	0.1%	0.0%	0.0%	**1.5%**	**96.6%**
-8 to -9	1.1%	0.2%	0.4%	0.1%	0.0%	0.0%	**1.9%**	**98.5%**
-9 to -10	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%	**0.4%**	**98.9%**
-10 to -11	0.6%	0.1%	0.0%	0.0%	0.0%	0.0%	**0.7%**	**99.7%**
-11 to -12	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	**0.2%**	**100.0%**
-12 to -13	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-13 to -14	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-14 to -15	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-15 to -16	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-16 to -17	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-17 to -18	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-18 to -19	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-19 to -20	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-20 to -21	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-21 to -22	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-22 to -23	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-23 to -24	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-24 to -25	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
Total	**52.1%**	**22.0%**	**19.7%**	**5.5%**	**0.5%**	**0.1%**	**100.0%**	
Cumulative	**52.1%**	**74.1%**	**93.8%**	**99.3%**	**99.8%**	**100.0%**		

** A small margin of error may occur due to rounding*

Table 4.5: Probability of Freezing Rain/Drizzle in HOT Table Temperature Ranges: Type I Fluids

Temperature (°C)	Rate (g/dm^2/h)				Total
	0 to 5	5 to 13	13 to 25	25+	
-3 and above	34.2%	13.7%	12.4%	4.5%	**64.9%**
below -3 to -6	12.8%	6.7%	5.2%	1.0%	**25.7%**
below -6 to -10	4.2%	1.4%	2.0%	0.7%	**8.3%**
Below -10	0.9%	0.2%	0.0%	0.0%	**1.1%**
Total	**52.1%**	**22.0%**	**19.7%**	**6.2%**	**100.0%**

** A small margin of error may occur due to rounding*

Table 4.6: Probability of Freezing Rain/Drizzle in HOT Table Temperature Ranges: Type II and Type IV Fluids

Temperature (°C)	Rate (g/dm^2/h)				Total
	0 to 5	5 to 13	13 to 25	25+	
-3 and above	34.2%	13.7%	12.4%	4.5%	**64.9%**
below -3 to -10	17.0%	8.2%	7.2%	1.7%	**34.1%**
Below -10	0.9%	0.2%	0.0%	0.0%	**1.1%**
Total	**52.1%**	**22.0%**	**19.7%**	**6.2%**	**100.0%**

** A small margin of error may occur due to rounding*

5. DETAILED EVALUATION OF FREEZING RAIN/DRIZZLE MIXED WITH OTHER PRECIPITATION TYPES

The freezing rain/drizzle data analysed in Section 4 included pure freezing rain/drizzle data *and* freezing rain/drizzle mixed with other precipitation type data. Section 5 examines the freezing rain/drizzle data that is mixed with other types of precipitation in more detail.

5.1 Pure and Mixed Freezing Rain/Drizzle Data

The analysis in this chapter is based on a limited data set: data collected only over the winters of 2007-08 to 2014-15 (with the exception of freezing rain/drizzle mixed with ice pellets data which includes data from 2006-07 – see Subsection 5.5). The data is provided in Appendix B.

During the 2007-08 to 2014-15 winters, 17,873 freezing rain/drizzle data points were collected. These data points include pure freezing rain/drizzle and freezing rain/drizzle mixed with other precipitation types. Table 5.1 shows the distribution of the pure and mixed freezing rain/drizzle data points.

Table 5.1: Distribution of 2007-08 to 2014-15 Freezing Rain/Drizzle Data Points by Precipitation Category

Precipitation Type	# of Data Points	%
Pure Freezing Rain/Drizzle	*10,569	60.2%
Freezing Rain/Drizzle Mixed with Snow	3,701	21.1%
Freezing Rain/Drizzle Mixed with Rain	2,116	12.1%
Freezing Rain/Drizzle Mixed with Ice Pellets	1,162	6.6%
Total	**17,548**	**100%**

**This value is for 2007-08 to 2014-15. An additional 314 data points were collected in 2006-07 and will be included as part of the analysis in Subsection 5.5*

The data in each of precipitation type categories listed in Table 5.1 is analysed in further detail in the following subsections of this chapter as listed below:

- Section 5.2: Pure Freezing Rain/Drizzle;
- Section 5.3: Freezing Rain/Drizzle Mixed with Snow;

- Section 5.4: Freezing Rain/Drizzle Mixed with Rain; and
- Section 5.5: Freezing Rain/Drizzle Mixed with Ice Pellets.

5.2 Pure Freezing Rain/Drizzle

The distribution of the 10,569 pure freezing rain/drizzle data points is presented by temperature in Figure 5.1 and by precipitation rate in Figure 5.2. Figure 5.3 plots the cumulative probability of precipitation over all possible precipitation rates.

This data for winters 2007-08 to 2014-15 is included in this section for completeness; it was also included and was described in Section 4 of this report on a cumulative basis.

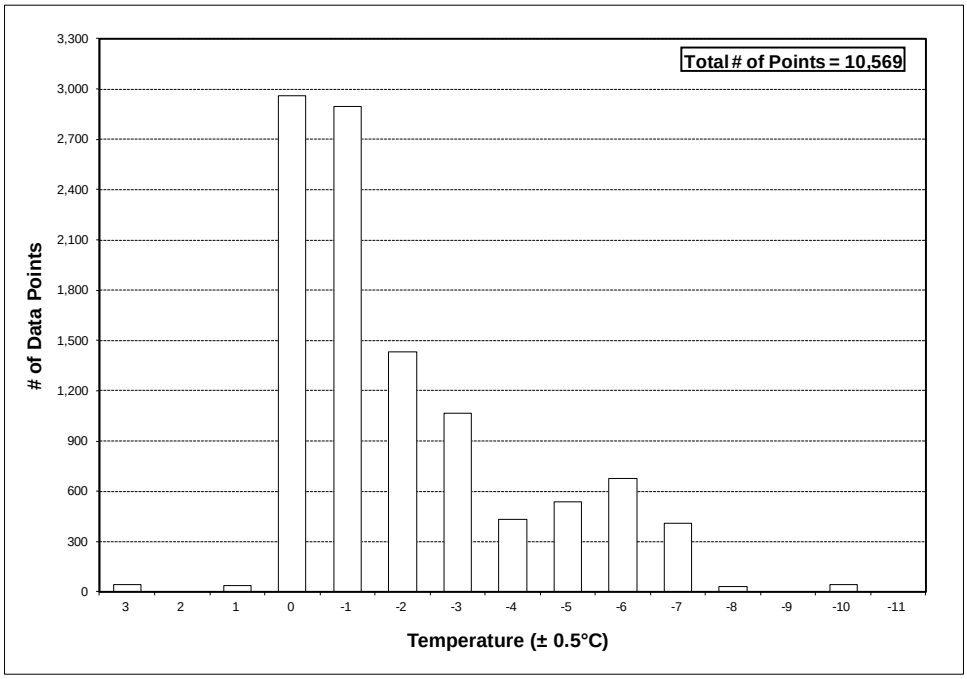

Figure 5.1: Distribution of Pure Freezing Rain/Drizzle Data Points by Temperature for Winters 2007-08 to 2014-15

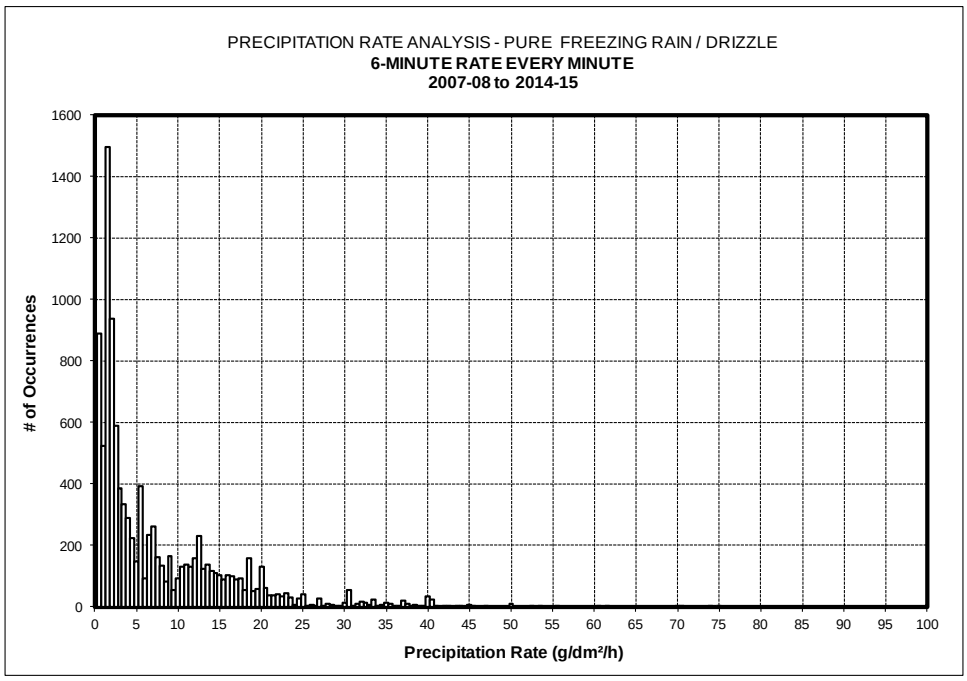

Figure 5.2: Distribution of Pure Freezing Rain/Drizzle Data Points by Precipitation Rate

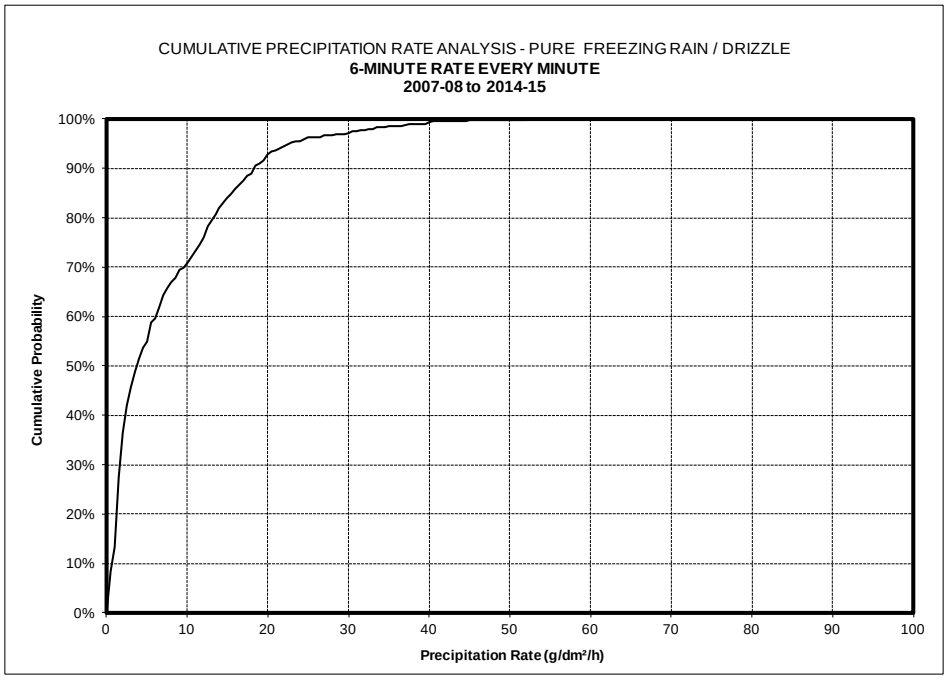

Figure 5.3: Cumulative Precipitation Rate Analysis for Pure Freezing Rain/Drizzle

5.3 Freezing Rain/Drizzle Mixed with Snow

Data for this precipitation category was analysed for the winters 2007-08 to 2014-15. The distribution of the 3,701 freezing rain/drizzle mixed with snow data points is presented by temperature in Figure 5.4 and by precipitation rate in Figure 5.5. Figure 5.6 plots the cumulative probability of precipitation over all possible precipitation rates.

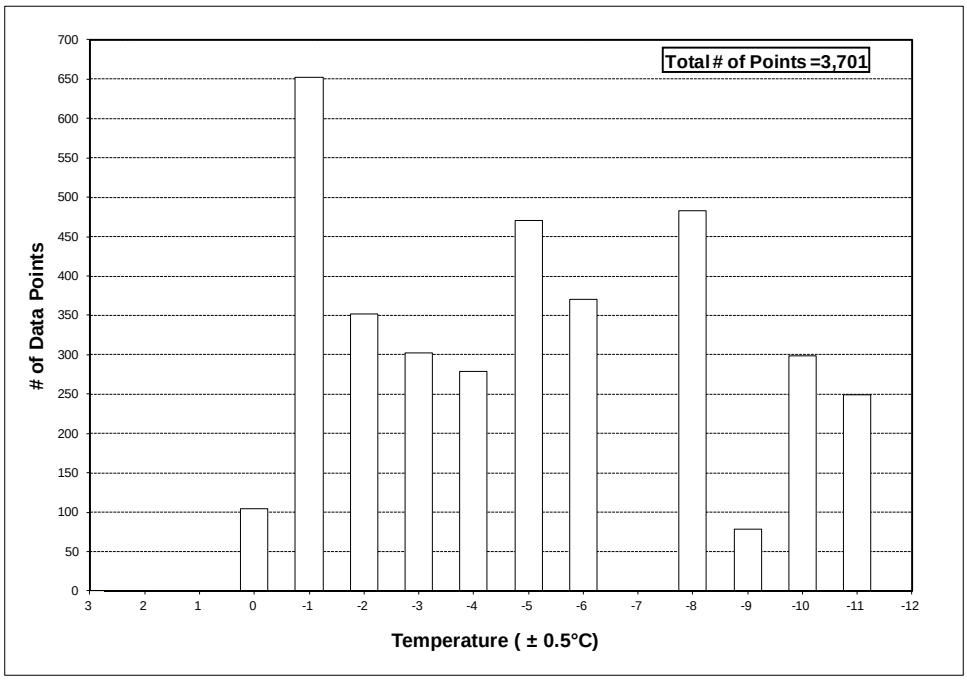

Figure 5.4: Distribution of Freezing Rain/Drizzle Mixed with Snow Data Points by Temperature for Winters 2007-08 to 2014-15

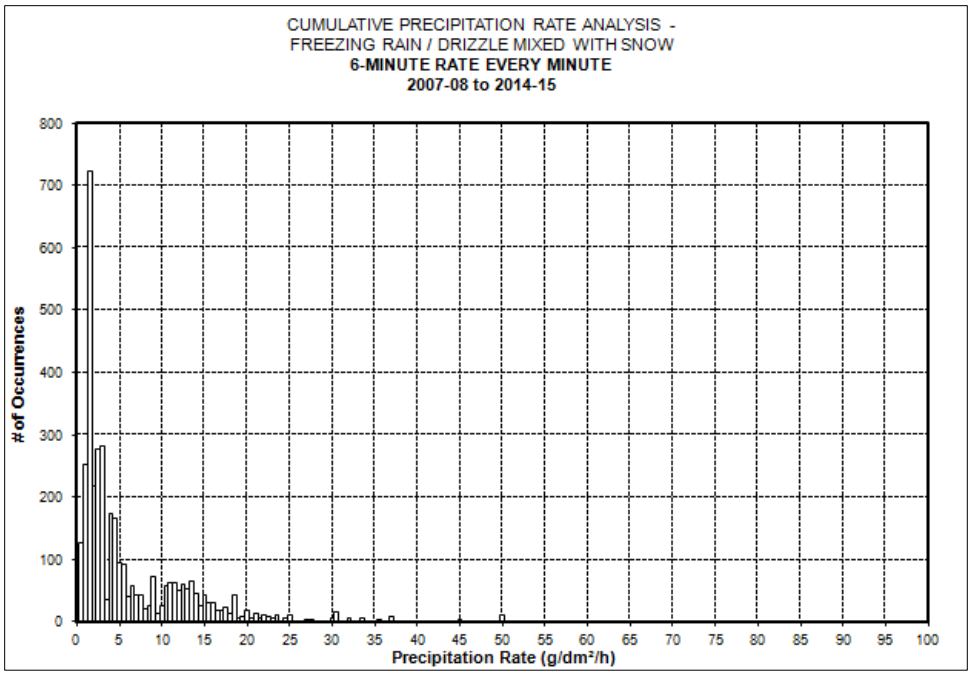

Figure 5.5: Distribution of Freezing Rain/Drizzle Mixed with Snow Data Points by Precipitation Rate

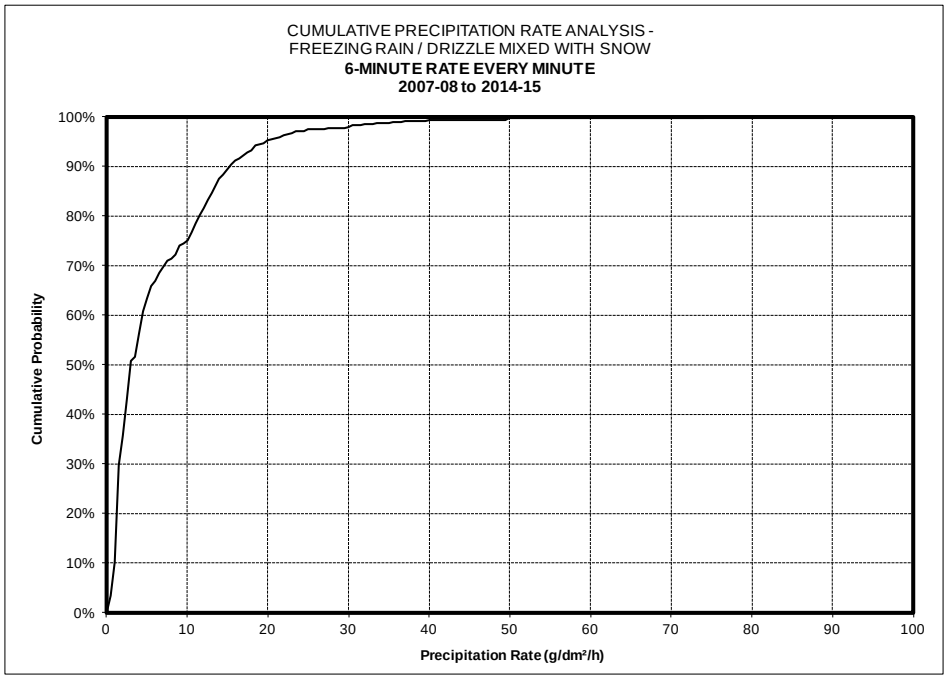

Figure 5.6: Cumulative Precipitation Rate Analysis for Freezing Rain/Drizzle Mixed with Snow

5.4 Freezing Rain/Drizzle Mixed with Rain

Data for this precipitation category was analysed for the winters 2007-08 to 2014-15. The distribution of the 2,116 freezing rain/drizzle mixed with rain data points is presented by temperature in Figure 5.7 and by precipitation rate in Figure 5.8. Figure 5.9 plots the cumulative probability of precipitation over all possible precipitation rates.

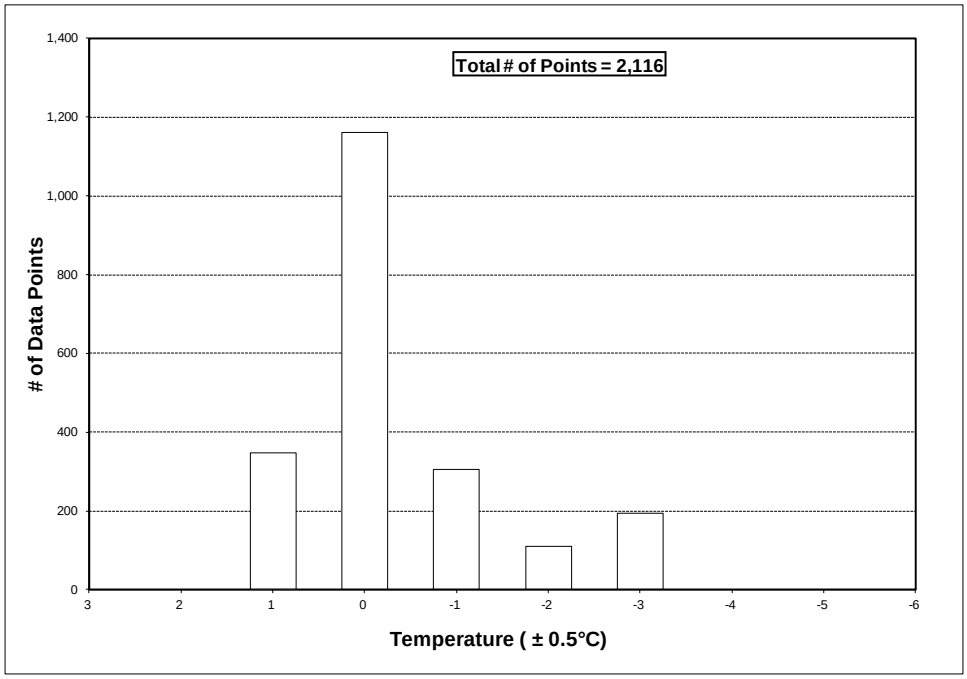

Figure 5.7: Distribution of Freezing Rain/Drizzle Mixed with Rain Data Points by Temperature

5.5 Freezing Rain/Drizzle Mixed with Ice Pellets

Data for this precipitation category is analysed for winters of 2006-07 to 2014-15, however no data points were collected in 2007-08 with freezing rain/drizzle mixed with ice pellets. Therefore, the following data were collected and analysed:

Data Points from 2006-07	*314*
Data Points from 2007-08	*0*
Data Points from 2008-09	*167*
Data Points from 2009-10	*255*
Data Points from 2010-11	*255*
Data Points from 2011-12	*195*
Data Points from 2012-13	*0*
Data Points from 2013-14	*145*
Data Points from 2014-15	*145*
Total	*1,476*

The distribution of the 2006-07 to 2014-15 freezing rain/drizzle mixed with ice pellets data by temperature is presented in Figure 5.10 and by precipitation rate in Figure 5.11. Figure 5.12 plots the cumulative probability of precipitation over all possible precipitation rates.

The temperature distribution of this limited data set indicates that the current temperature ranges in the ice pellets allowance table are suitable.

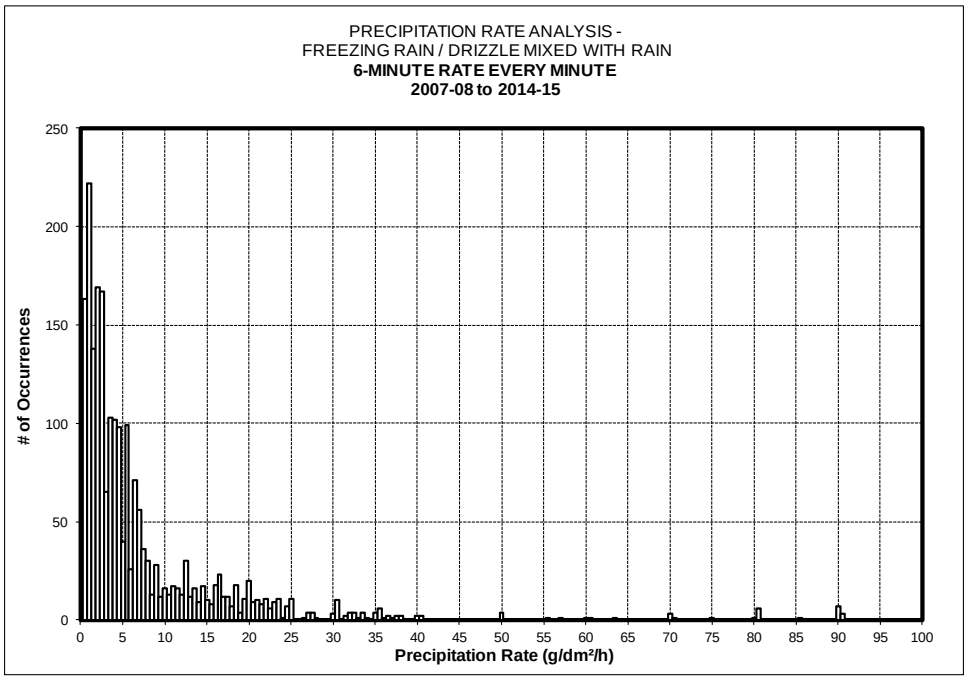

Figure 5.8: Distribution of Freezing Rain/Drizzle Mixed with Rain Data Points by Precipitation Rate

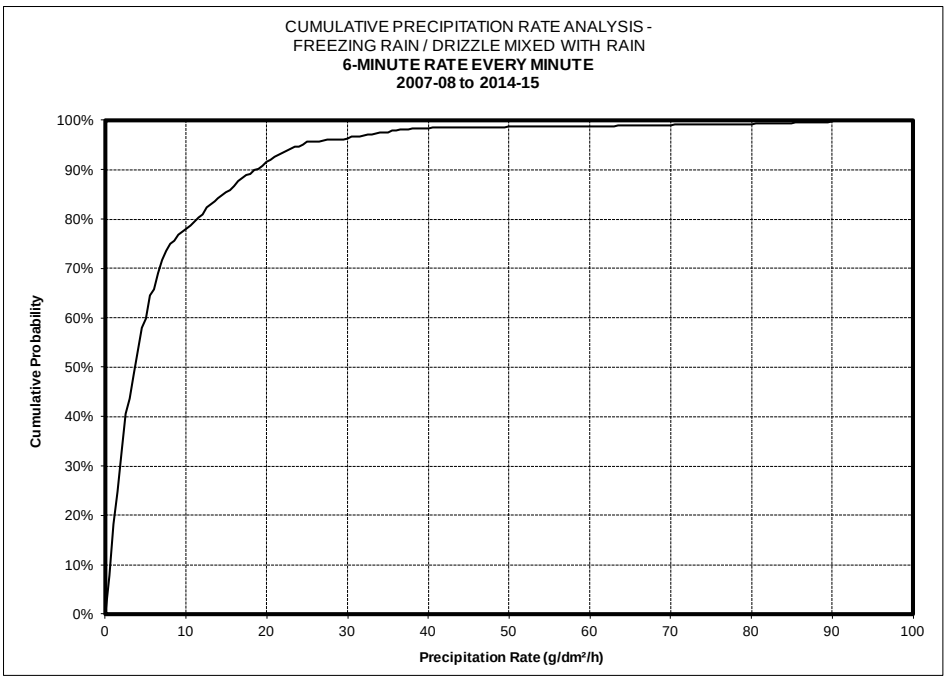

Figure 5.9: Cumulative Precipitation Rate Analysis for Freezing Rain/Drizzle Mixed with Rain

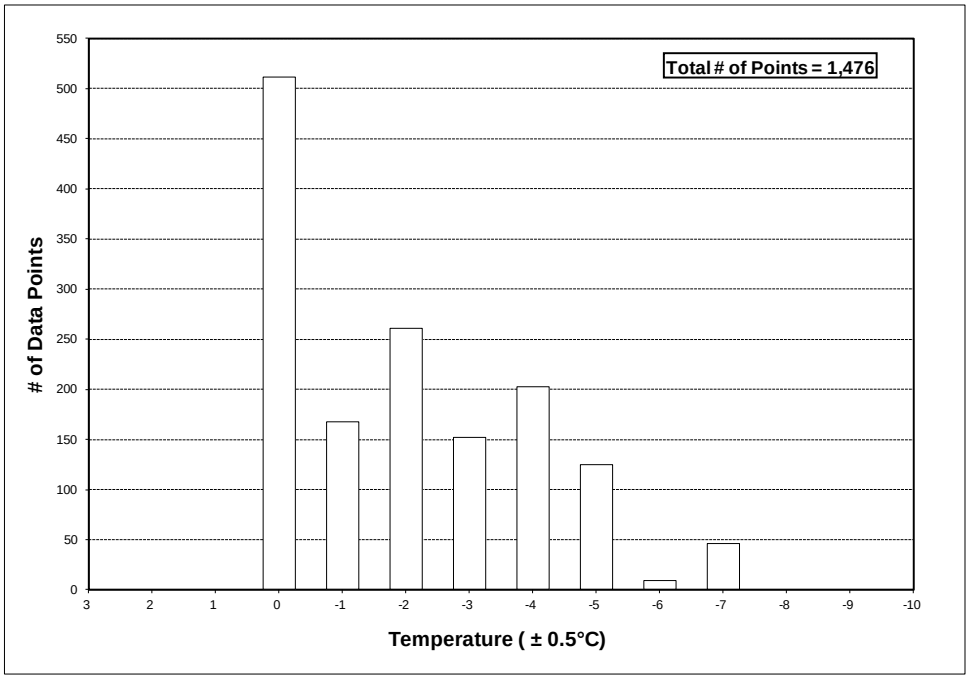

Figure 5.10: Distribution of Freezing Rain/Drizzle Mixed with Ice Pellets Data Points by Temperature for Winters 2006-07 to 2014-15

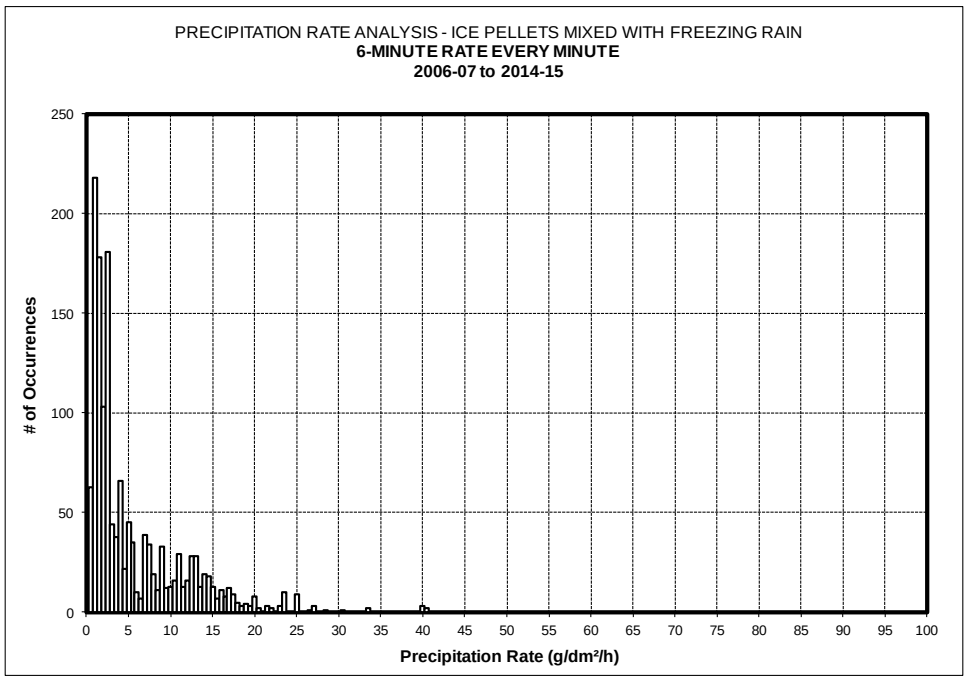

Figure 5.11: Distribution of Freezing Rain/Drizzle Mixed with Ice Pellets Data Points by Precipitation Rate

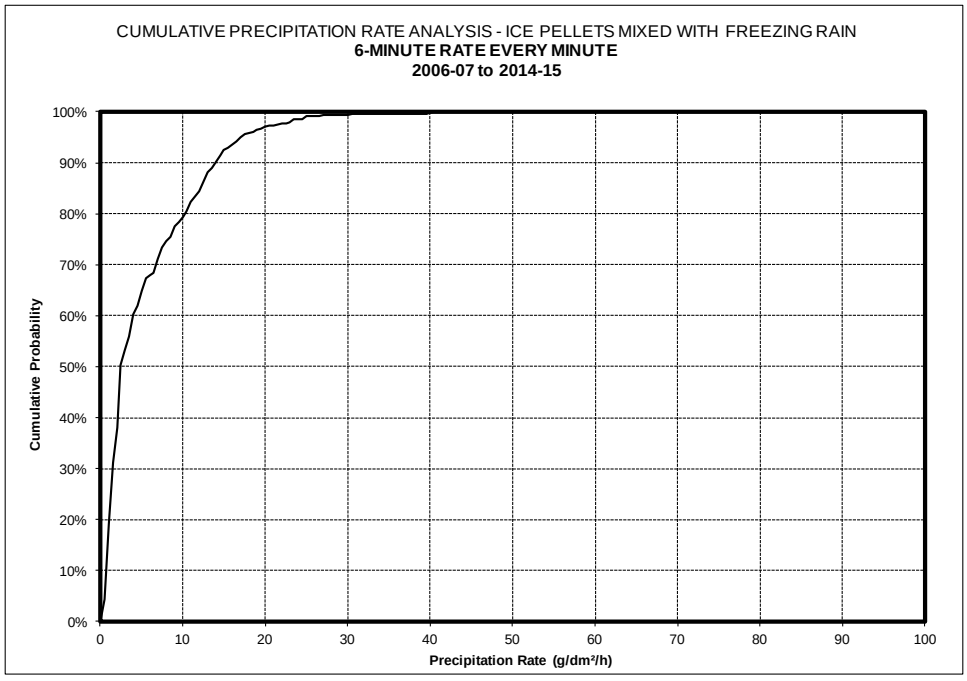

Figure 5.12: Cumulative Precipitation Rate Analysis for Freezing Rain/Drizzle Mixed with Ice Pellets

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6. ICE PELLETS MIXED WITH OTHER PRECIPITATION ANALYSED SEPARATELY IN DETAIL

The analysis in Section 6 includes data on pure ice pellets and data on ice pellets mixed with other precipitation types. This analysis has been done to better understand the conditions under which ice pellets occur.

6.1 Pure and Mixed Ice Pellets Data

The analysis in this chapter is based on a limited data set: the data set includes data collected only over the winters of 2006-07 to 2014-15. This data is approximate, as the methodology used to collect data does not allow for exact determination of the occurring precipitation.

Data points for pure ice activity were extracted from all ice pellet events with the following procedure. Using the hourly observations of atmospheric data provided by MSC, data were selected that occurred 15 minutes before and 15 minutes after any hour that the MSC observer noted ice pellets and not other precipitation types. This was done because an assumption was made that this type of precipitation did not necessarily last throughout the hour. The data is included in Appendix B.

Over the nine winters, a total of 9,252 data points were collected (see Table 6.1). This represents approximately 154 hours of data collected at five Quebec weather stations. Table 6.1 shows the distribution of the pure and mixed ice pellet data points.

The data in each precipitation type category listed in Table 6.1 is analysed in detail in the following subsections of this chapter as listed below:

- Section 6.2: Pure Ice Pellets;
- Section 6.3: Ice Pellets Mixed with Snow;
- Section 6.4: Ice Pellets Mixed with Rain; and
- Section 6.5: Ice Pellets Mixed with Freezing Rain/Drizzle

Table 6.1: Distribution of Ice Pellet Data Points by Precipitation Category

Precipitation Type	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	Total	%
Pure Ice Pellets	459	170	548	290	205	110	470	85	85	**2,422**	**26%**
Ice Pellets Mixed with Snow or Snow Grains	584	579	488	750	845	227	255	0	25	**3,753**	**41%**
Ice Pellets Mixed with Rain	324	230	102	255	315	290	0	85	0	**1,601**	**17%**
Ice Pellets Mixed with Freezing Rain/Drizzle	314	0	167	255	255	195	0	145	145	**1,476**	**16%**
Total	**1,681**	**979**	**1,305**	**1,550**	**1,620**	**822**	**725**	**315**	**255**	**9,252**	**100%**

6.2 Pure Ice Pellets

The distribution of the 2,422 pure ice pellets data points is presented by temperature in Table 6.2 and by precipitation rate in Figure 6.1. Figure 6.2 plots the cumulative probability of precipitation over all possible precipitation rates.

Table 6.2: Distribution of Pure Ice Pellets Data by Temperature

Total Points = 2,422	%
Above -5°C	92%
Between -5 and -10°C	8%
Below -10°C	0%
Total	**100.0%**

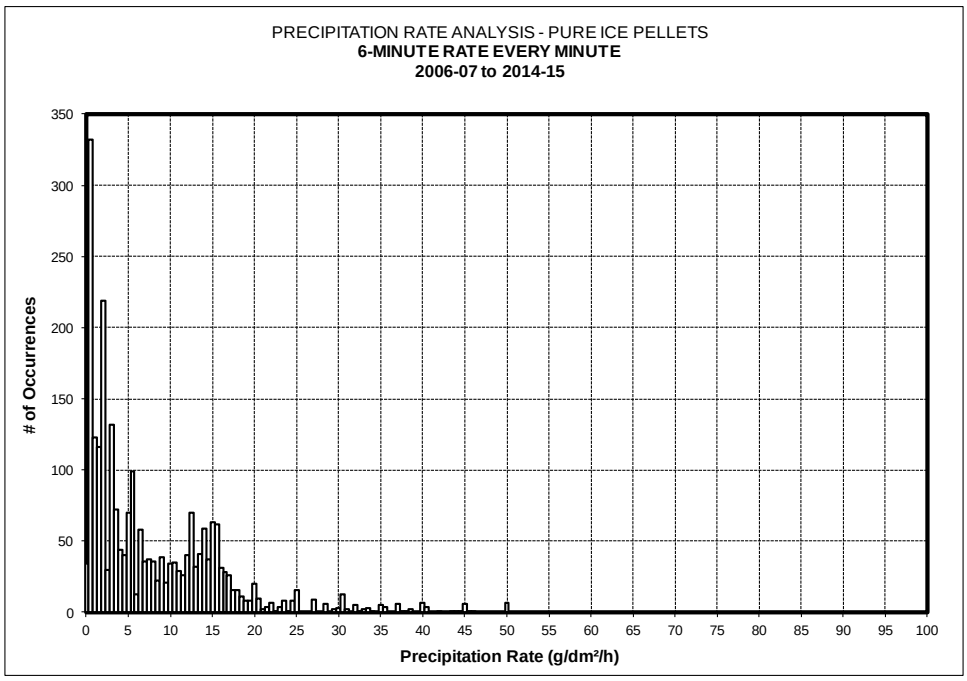

Figure 6.1: Distribution of Pure Ice Pellets Data Points by Precipitation Rate

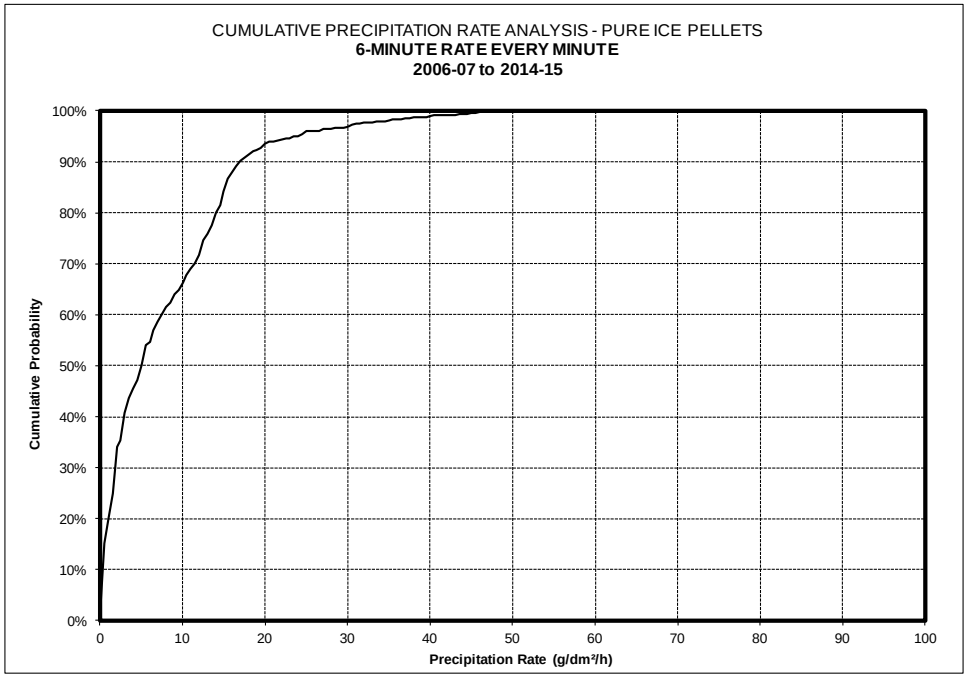

Figure 6.2: Cumulative Precipitation Rate Analysis for Pure Ice Pellets

6.3 Ice Pellets Mixed with Snow

The distribution of the 3,753 ice pellet mixed with snow data points is presented by temperature in Table 6.3 and by precipitation rate in Figure 6.3. Figure 6.4 plots the cumulative probability of precipitation over all possible precipitation rates.

Table 6.3: Distribution of Ice Pellets Mixed With Snow Data by Temperature

Total Points = 3,753	%
Above -5°C	75%
Between -5 and -10°C	25%
Below -10°C	0%
Total	**100.0%**

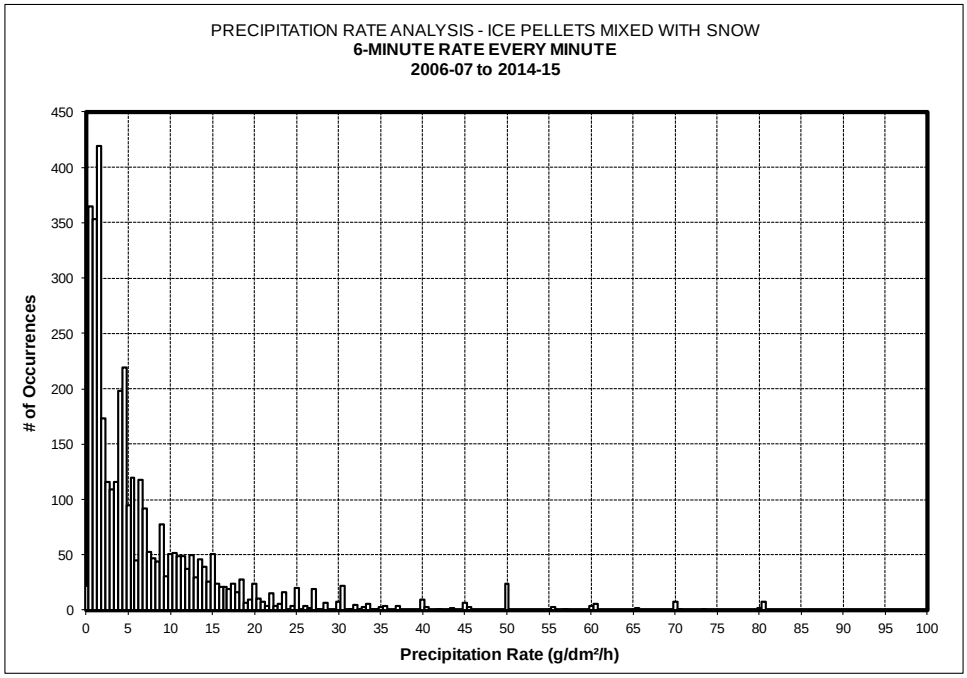

Figure 6.3: Distribution of Ice Pellets Mixed with Snow Data Points by Precipitation Rate

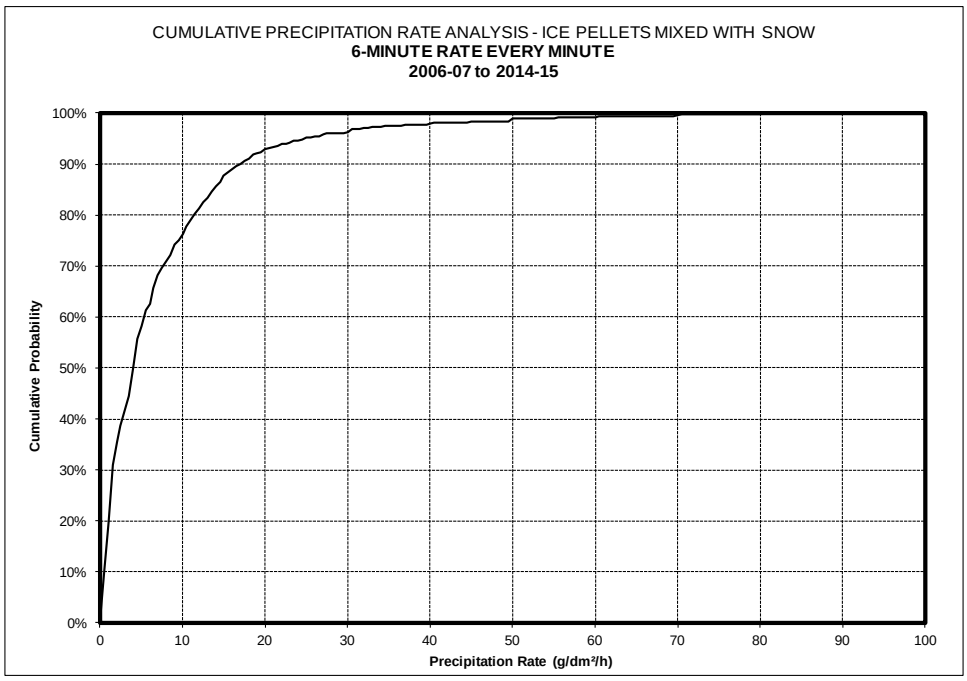

Figure 6.4: Cumulative Precipitation Rate Analysis for Ice Pellets Mixed with Snow

6.4 Ice Pellets Mixed with Rain

The distribution of the 1,601 ice pellet mixed with rain data points is presented by temperature in Table 6.4 and by precipitation rate in Figure 6.5. Figure 6.6 plots the cumulative probability of precipitation over all possible precipitation rates.

Table 6.4: Distribution of Ice Pellets Mixed with Rain Data by Temperature

Total Points = 1,601	**%**
Above -5ºC	100%
Between -5 and -10°C	0%
Below -10°C	0%
Total	**100.0%**

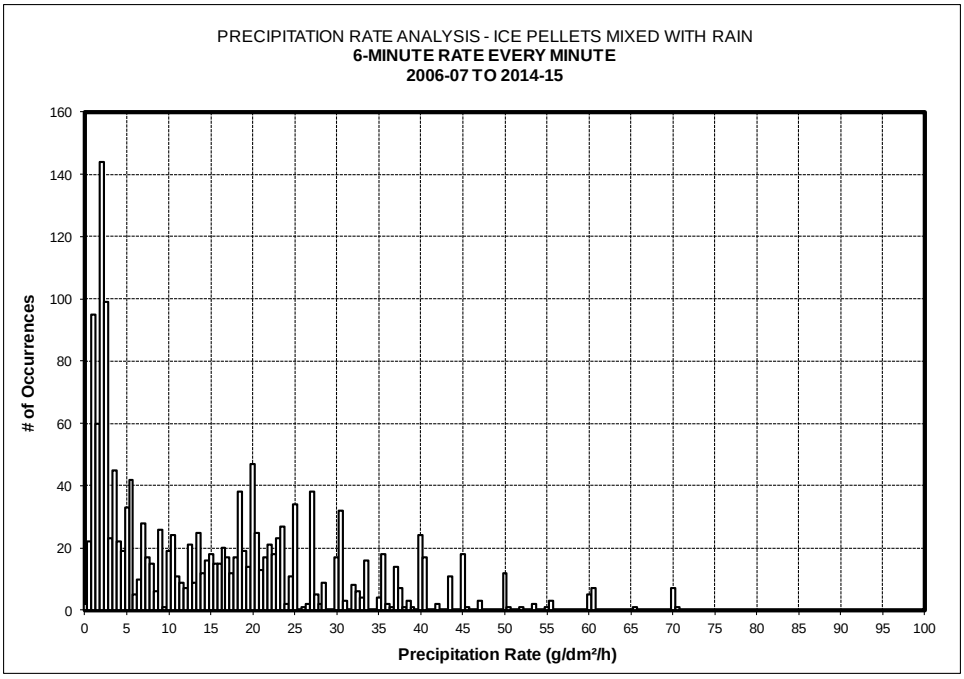

Figure 6.5: Distribution of Ice Pellets Mixed with Rain Data Points by Precipitation Rate

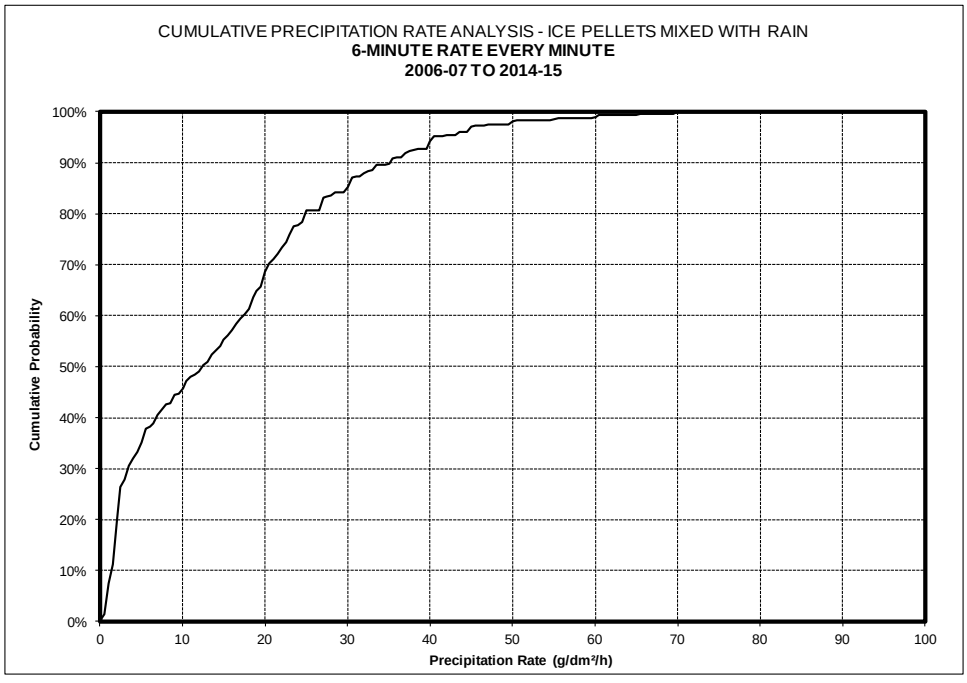

Figure 6.6: Cumulative Precipitation Rate Analysis for Ice Pellets Mixed with Rain

6.5 Ice Pellets Mixed with Freezing Rain/Drizzle

An analysis of ice pellets mixed with freezing rain/drizzle is shown in Section 5.5.

6.6 Likelihood of Occurrences for use with Ice Pellet Allowance Times

In an attempt to find the optimum temperature breakdowns for the Ice Pellet Allowance Time Tables, the ice pellet dataset was divided into 1°C intervals. This was also completed for each mixed precipitation category where ice pellets are present. In addition, each temperature range was split into precipitation rate ranges using 1 g/dm^2/h increments. A complete set of distribution tables are included in Appendix E. The results were translated into likelihood of ice pellet occurrence in each cell of the allowance time table. The outcome is shown in Table 6.5.

Values in italics in Table 6.5 indicate conditions where no allowance times currently exist. Based on this limited data, it appears a significant portion of precipitation can occur below -10°C in light ice pellets mixed with light snow, where no allowance times currently exist. Similarly, light ice pellets mixed with moderate snow at temperatures less than -5°C to -10°C, and outside air temperature (OAT) less than -10°C can also occur; no ice pellet allowance times currently exist.

Table 6.5: Likelihood of Occurrence for use with Ice Pellet Allowance Times

Condition	Possible Rate	OAT -5°C and above	OAT less than -5°C to -10°C	OAT less than -10°C	Total
Light Ice Pellets	(0 to 25 g/dm^2/h)	89.2%	6.9%	0.0%	**100%**
Moderate Ice Pellets	(25 to 75 g/dm^2/h)	3.9%	0.0%	0.0%	
***Light Ice Pellets Mixed with Light or Moderate Freezing Drizzle**	(0 to 38 g/dm^2/h)	94.9%	5.1%	*0%*	**100%**
***Light Ice Pellets Mixed with Light Freezing Rain**	(0 to 50 g/dm^2/h)				
***Light Ice Pellets Mixed with Light Rain**	(0 to 50 g/dm^2/h)	98.2% (1)	*1.9%*	*0%*	
***Light Ice Pellets Mixed with Moderate Rain**	(25 to 100 g/dm^2/h)	**18.8%(2)	*0%*	*0%*	
***Light Ice Pellets Mixed with Light Snow**	(0 to 35 g/dm^2/h)	72.5%	14.4%(3)	*10.6%*	
***Light Ice Pellets Mixed with Moderate Snow**	(10 to 50 g/dm^2/h)	16.4%(4)	*5.8%*	*0.6%*	

Values in italics indicate conditions where no allowance times currently exist.
*Analysis based upon a cumulative rate of both precipitation types and assumes ice pellet intensity does not exceed "light" or 25 g/dm^2/h
** A significant increase in this probability is due to one particular event with high rates, coupled with a limited data set.

FOOTNOTES

(1) In a precipitation condition of ice pellets mixed with rain, at OAT -5°C and above, there is a 98.2% likelihood that the rate will be within a range from 0 to 50 g/dm^2/h

(2) In a precipitation condition of ice pellets mixed with rain, at OAT -5°C and above, there is an 18.8% likelihood that the rate will be within a range from 25 to 100 g/dm^2/h

(3) In a precipitation condition of ice pellets mixed with snow, at OAT -5°C to -10°C, there is a 12.8% likelihood that the rate will be within a range from 0 to 35 g/dm^2/h

(4) In a precipitation condition of light ice pellets mixed with moderate snow, at OAT -5°C to -10°C, there is a 16.4% likelihood that the rate will be within a range from 10 to 50 g/dm^2/h

6.6.1 Occurrences of Moderate Ice Pellets at Temperatures Below -10ºC

Testing is conducted at the NRC Propulsion and Icing Wind Tunnel (PIWT) to develop the ice pellet allowance time table. The research indicated that consideration should be given to reducing the allowance times for moderate ice pellets below -10ºC for propylene glycol based fluids.

An investigation of several meteorology sources indicated that the likelihood of moderate ice pellets at temperatures below -10º C was minimal:

- A detailed look at MSC Data for Montreal from 1990 – 2001 (mentioned in Section 2.1.1.2) indicated that there were only 2 hourly observations in span of 10 years in which moderate ice pellets occurred at temperatures below -10ºC;
- A further analysis of the Journal report on ice pellets mentioned in Section 2.1.2 indicates that less than 2 percent of all ice pellet occurrences fall below -10º C. This would suggest that there are even less occurrences with moderate ice pellets;
- A request was made by Transport Canada to MSC for some additional data pertaining to moderate ice pellets occurring below -10ºC. This data analysed 205 individual airports over a span of 30 years, indicating only 194 hourly observations recorded with moderate and heavy ice pellets (possibly including mixed conditions with ice pellets) below -10ºC; and
- Table 6.5 of this report shows no indication of light or moderate ice pellets occurring below -10º C, however this is based on limited data over a 5 year period from 6 stations in Quebec.

For operation in the winter of 2014-15, application of the moderate ice pellet allowance times below -10ºC is now limited to -16 ºC.

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7. WINTER OPERATIONS SURVEY

Between 2000-01 and 2002-03, APS conducted an annual survey on behalf of TC in an attempt to collect data on actual deicing operations at several worldwide stations. TC was seeking this information in support of a review of the HOT table temperature and weather condition breakdowns so that future research and development could be aimed at conditions where an important number of operations occur worldwide. In addition, the intent was to identify where improvements could be made to the HOT table format.

To acquire a worldwide representation of deicing operations, TC distributed the survey to a number of fluid users. The combined results from the three surveys provided data for 112 535 deicing operations (Type I Table) and 86 853 anti-icing operations (Type II/IV Table). The de/anti-icing operations were sorted by weather condition: frost, freezing fog, snow, freezing drizzle, light freezing rain, and other (snow pellets, snow grain, ice pellets, rime ice). A detailed analysis of the results for each year analysed by weather condition, temperature and fluid type was completed and can be found in Section 3 of the TC report, TP 14375E, *Winter Weather Impact on Holdover Time Table Format (1995-2004)*, (2).

Figure 7.1 demonstrates the combined results of the three annual surveys. The number of de/anti-icing operations that occurred under snow precipitation was 56 percent, thus substantiating the belief that snow represents the most significant weather condition for de/anti-icing operations worldwide. Frost accounted for 33 percent of de/anti-icing operations; freezing precipitation, including freezing fog, freezing drizzle, light freezing rain, and rain on cold-soak wing accounted for 7 percent of operations; and the remaining 4 percent of operations were conducted due to other forms of freezing precipitation.

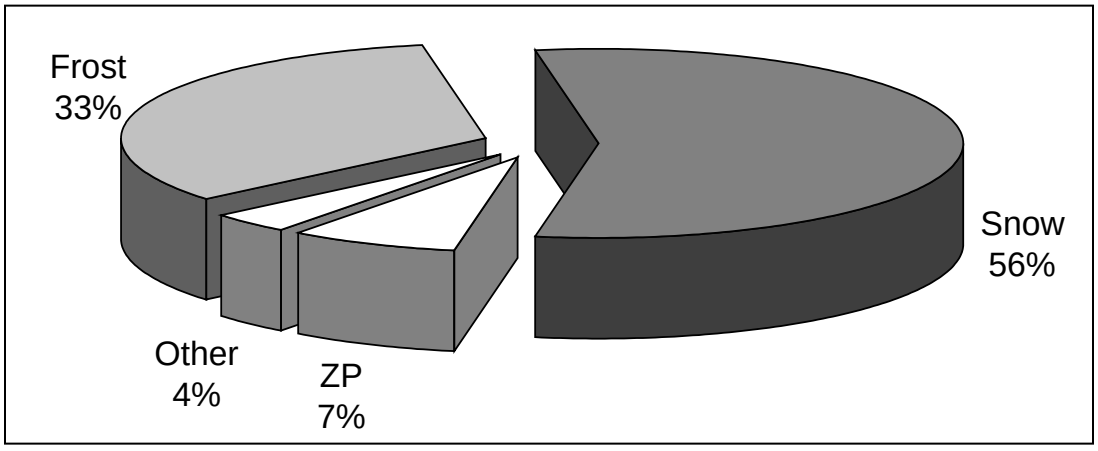

Figure 7.1: Frequency of De/Anti-icing Operations (All Airports) – Combined Results of 2000-01 to 2002-03 Surveys

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8. CHANGES TO THE FORMAT OF THE HOLDOVER TIME TABLES

This section presents a summary of the changes made to the HOT table format over the last ten years. These changes are described in detail in related reports. The titles of these reports are provided. Changes to the HOT table formats, agreed upon by the industry members in a certain year, are reflected in the HOT tables of the following winter season.

8.1 Changes Made in 2001-02, to Appear in the 2002-03 Tables

In 2001-02, the Type I fluid HOT table format underwent a thorough examination. Research in previous years had indicated a need to make changes to the format. Some of the changes were presented and accepted by the deicing community, while others were not formally accepted. The two major changes made to the format of the Type I fluid HOT table were:

a) Modifying the split point between the two warmest temperature ranges from 0°C to -3°C (temperature ranges change from *above 0°C* and *0°C* to *-10°C* to *above -3°C* and *-3°C* to *-10°C*); and

b) Addition of a column for light snow.

A detailed study providing the reasoning and justification behind these changes was conducted and can be found in Section 6 of the TC report, TP 13993E, *Impact of Winter Weather on Holdover Time Table Format (1995-2002)*, (3).

8.2 Changes Made in 2002-03, to Appear in the 2003-04 Tables

In 2002-03 the format of the Type I HOT tables was further reviewed and two significant changes were implemented:

a) A new temperature range was introduced by splitting the -3 to -10°C interval into below -3 to -6°C and below -6 to -10°C temperature ranges; and

b) In addition to the existing light snow and moderate snow columns, a new very light snow column was introduced.

A detailed analysis which justifies these two major changes was conducted and can be found in Section 4 of the TC report, TP 14146E*, Winter Weather Impact on Holdover Time Table Format (1995-2003)*, (8).

8.3 Changes Made in 2003-04, to Appear in the 2004-05 Tables

A new Type III generic HOT table was introduced in 2003-04. The development of the new table is described in Section 5 of TC report, TP 14374E, *Aircraft Ground De/Anti-Icing Fluid Holdover Time Development Program for the 2003-04 Winter* (9).

8.4 Changes Made in 2004-05, to Appear in the 2005-06 Tables

In 2004-05, rows for 75/25 and 50/50 dilutions were added to the Type III generic HOT table and several changes were made to the format of the Type II/IV HOT tables. These changes included merging the two warmest temperature rows, changing the title of the snow column to Snow or Snow Grains, changing the title of the frost column to Active Frost and moving the viscosity information from the fluid specific tables to a separate viscosity table.

These changes are described in detail in the TC report, TP 14443E, *Aircraft Ground De/Anti-Icing Fluid Holdover Time Development Program for the 2004-05 Winter* (10).

8.5 Changes Made in 2005-06, to Appear in the 2006-07 Tables

No major changes were made to the formats of the HOT tables in 2005-06.

8.6 Changes Made in 2006-07, to Appear in the 2007-08 Tables

In 2006-07, the lowest on wing viscosity (LOWV) values for dilutions of Type II, Type III, and Type IV fluids were added to the HOT guidelines. They were added to the fluid viscosity table.

Ice pellet allowance times and guidance material were also added for undiluted Type IV fluids in 2006-07.

These changes are described in detail in the TC report, TP 14776E, *Aircraft Ground De/Anti-Icing Fluid Holdover Time Development Program for the 2006-07 Winter* (11).

8.7 Changes Made in 2007-08, to Appear in the 2008-09 Tables

In 2007-08, a note was added to all Type II and Type IV tables to advise users that radiation cooling during active frost conditions may reduce holdover time when operating close to the lower end of the temperature range.

This change is described in detail in the TC report, TP 14869E, *Aircraft Ground De/Anti-Icing Fluid Holdover Time Development Program for the 2007-08 Winter* (12).

8.8 Changes Made in 2008-09, to Appear in the 2009-10 Tables

The following changes were made to the format of the HOT tables in 2008-09:

a) The frost HOTs were moved from the generic and fluid-specific tables to a new active frost HOT table. Reductions were made to some Type II and Type IV HOT values;

b) The below -25°C row was removed from the Type II and Type IV HOT tables. In its place, the below -14 to -25°C row was modified to below -14 to -25°C or Lowest Operational Use Temperature (LOUT);

c) A note indicating light freezing rain HOTs can be used in conditions of light snow mixed with light rain was added to all (Type I, Type II, Type III and Type IV) HOT tables; and

d) The guidance material for operations during ice pellet conditions was expanded and modified. Specifically, guidance for operations in light ice pellets mixed with moderate rain was added and guidance for operations in light ice pellets mixed with light or moderate snow was expanded.

These changes are described in detail in the TC report, TP 14933E, *Aircraft Ground De/Anti-Icing Fluid Holdover Time Development Program for the 2008-09 Winter* (13).

8.9 Changes Made in 2009-10, to Appear in the 2010-11 Tables

The following changes were made to the format of the HOT tables in 2009-10:

a) Holdover times for Type I fluids on composite surfaces were added to the Type I HOT table and to the frost table;

b) The snow column heading in all Type I, Type II, Type III and Type IV HOT tables was modified to include snow pellets;

c) The "above -1°C" / "above 30°F" row in the frost table was corrected to "-1°C and above" / "30°F and above";

d) Several changes were made to the table footnotes in an attempt to harmonize the TC tables with the Association of European Airline tables and to structure the notes in an orderly fashion; and

e) A table of Lowest Operational Use Temperatures (LOUTs) was added to the HOT guidelines at the request of users.

These changes are described in detail in the TC report, TP 15050E, *Aircraft Ground De/Anti-Icing Fluid Holdover Time Development Program for the 2009-10 Winter* (14).

8.10 Changes Made in 2010-11, to Appear in the 2011-12 Tables

The following changes were made to the format of the HOT tables in 2010-11:

a) The Type I HOT table was divided into two tables: one table for aluminum surface holdover times and a separate table for composite surface holdover times; and

b) The lower limit of the lowest temperature band in the Type II and Type IV fluid-specific HOT tables was changed from "-25°C or LOUT" to the fluid's actual LOUT in numeric format.

These changes are described in detail in the TC report, TP 15156E, *Aircraft Ground De/Anti-Icing Fluid Holdover Time Development Program for the 2010-11 Winter* (15).

8.11 Changes Made in 2011-12, to Appear in the 2012-13 Tables

The following change was made to the format of the HOT tables in 2011-12:

Active Frost

a) The lowest temperature band in the Type I portion of the active frost table has changed from "below -21 to -25°C" to "below -21 to -25°C or LOUT". This change has been made to more clearly indicate that the Type I active frost holdover times can be used at temperatures below -25°C as long as the fluid LOUT is respected.

These changes are described in detail in the TC report, TP 15203E, Aircraft Ground De/Anti-Icing Fluid Holdover Time Development Program for the 2011-12 Winter (16).

8.12 Changes Made in 2012-13, to Appear in the 2013-14 Tables

The following changes were made to the format of the HOT tables in 2012-13:

a) Some Type II and IV fluid-specific HOT tables have been upgraded to include three columns of snow holdover times. The three columns provide holdover times for three snowfall intensities: very light, light and moderate. Light snow and very light snow categories will be added to eleven fluid specific tables; and

b) Recent testing has shown that freezing fog holdover times can be used in ice crystal conditions. As a result, the freezing fog columns in all Type I, Type II, Type III and Type IV fluid HOT tables have been modified to include ice crystals. Furthermore, TP 14052 has been modified to include guidance for operating without fluids in certain ice crystal conditions (cold temperatures when it can be determined the ice crystals are not adhering to the wing).

These changes are described in detail in the TC report, TP 15228E, *Aircraft Ground De/Anti-Icing Fluid Holdover Time Development Program for the 2012-13 Winter* (17).

8.13 Changes Made in 2013-14, to Appear in the 2014-15 Tables

The following changes were made to the format of the HOT tables in 2013-14:

a) Transport Canada has conducted research to provide additional guidance for aircraft operations during ice pellet conditions when operating with Type III undiluted (100/0) fluid applied un-heated. A separate ice pellet allowance time table has been developed for Type III fluids and is included in this revision; and

b) The meteorological conditions “hail” and “small hail” are not equivalent. No holdover times exist for either of these conditions; however, it has been determined that small hail is meteorologically equivalent to moderate ice pellets and therefore moderate ice pellet allowance times can be used in small hail conditions. The following changes have been made to provide clearer guidance on the use of holdover times and allowance times in hail and small hail conditions.

- Small hail has been added to the list of "other" weather conditions for which holdover times do not exist. This list is provided as a note in each of the Type I, II, III and IV HOT guidelines;
- Additional text has been added to the "other" weather conditions note in the Type IV HOT guidelines to guide users to the allowance times table in ice pellet and small hail conditions; and
- Small hail has been added to the allowance times table.

These changes are described in detail in the TC report, TP 15271, *Aircraft Ground De/Anti-Icing Holdover Time Development Program for the 2013-14 Winter* (18).

8.14 Changes Made in 2014-15, to Appear in the 2015-16 Tables

The following changes were made to the format of the HOT tables in 2014-15:

a) The generic Type III HOT table is being removed. As only 1 heated Type III table and 1 unheated Type III table currently exist there is no need for a generic table (as fluid must be known in order to know which table to use);

b) Fluid and application temperature specific Type III HOT tables are being added to replace the removed table; and

c) Guidance with respect to small hail has been changed in the HOT tables and related guidance materials.

8.15 Future Changes

Harmonizing the holdover time tables of the three agencies (Transport Canada, FAA, and Association of European Airlines (AEA)) has been discussed. A working group has been formed to look at the viability of having one standard set of tables.

8.15.1 Potential Changes to HOT Table Values

A three-year survey of worldwide fluid users showed that the majority of the de/anti-icing operations occur under snow precipitation, thus substantiating that snow represents the most significant weather condition for deicing operations worldwide. Table 8.1 shows the results from the survey by weather condition and temperature range. The temperature ranges in Table 8.1 reflect the format changes implemented in the 2005-06 HOT tables. The percentage values in the table are re-calculated after the exclusion of the frost column. As can be seen in Table 8.1, in

the absence of the frost column, snow accounts for over 83 percent of all deicing operations.

The weather conditions in the highlighted section of Table 8.1 represent more than 87 percent of all deicing operations. In other words, the cells in the highlighted section of the table are utilised more than 87 percent of the time when deicing operations take place in precipitation conditions excluding frost.

Table 8.1: Usage of HOT Table, Excluding Frost

OAT (°C)	FREEZING FOG	SNOW	FREEZING DRIZZLE	LIGHT FRZ. RAIN	RAIN ON COLD SOAKED WING	OTHER	Total
-3 and above	2.4%	52.8%	3.5%	2.9%	1.4%	1.3%	64.2%
-3 to -14	1.5%	28.1%	1.4%	1.2%	0.0%	1.4%	33.6%
-14 to -25	0.0%	2.2%	0.0%	0.0%	0.0%	0.0%	2.2%
below -25	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Total	3.8%	83.1%	4.9%	4.1%	1.4%	2.7%	100.0%

** A small margin of error may occur due to rounding*

It could be envisioned that in the future, the endurance times of new deicing fluids will be tested in these cells only, as they account for the vast majority of precipitation conditions requiring deicing. The remaining cells in the table could be replaced by generic values and would be the same for all fluid specific HOT tables. An example of this vision is described in more detail in the TC report, TP 14719E, *Aircraft Ground Icing Research General Activities During the 2005-06 Winter* (19).

8.15.2 Heavy Snow

In recent years, airlines have requested that holdover times be provided for heavy snow conditions. Heavy snow is currently covered in the various holdover time tables by a caution note that states that "No Holdover Time Guidelines Exist".

HOT values in the current holdover time guidelines are determined by plotting fluid endurance time data points collected in natural snow conditions versus rate of precipitation, and then using regression analysis to calculate the fluid endurance times at two pre-selected rate limits (10 and 25 g/dm^2/h, which encompasses moderate snow). These regression curves could be used to determine fluid holdover

times in heavy snow. For example, Figure 8.1 shows the regression curves developed for most commercially available Type IV fluids, including the extrapolated portion of the curves in heavy snow beyond rates of 25 g/dm^2/h.

In order to derive heavy snow holdover times from this data, an upper precipitation rate limit would need to be set for heavy snow. For example, heavy snow may be defined as 25 to 50 g/dm^2/h; the lower and upper holdover times in the heavy snow cells would be calculated at 50 and 25 g/dm^2/h, respectively. Precipitation falling at rates above the upper limit would be defined as "very heavy snow", for which no holdover times would exist.

Because natural snow data at heavy snow rates of precipitation is often very limited, the regression curves mentioned above may not be accurate. Alternately, holdover times for heavy snow could be generated by conducting simulated snow tests with the National Centre for Atmospheric Research (NCAR) snowmaker. This data could be compared to the regression data to confirm its accuracy.

Due to the high liquid water equivalent (LWE) of snow at high rates of precipitation, and the short holdover times that subsequently result, the SAE G-12 HOT Workgroup proposed (Lisbon, May 2006) that no HOT guidelines in heavy snow be provided until equipment to measure LWE was operationally available at airports. It was the view of the HOT Workgroup that longer and more precise holdover time information could be provided in many other winter operating conditions in addition to heavy snow if the LWE were known.

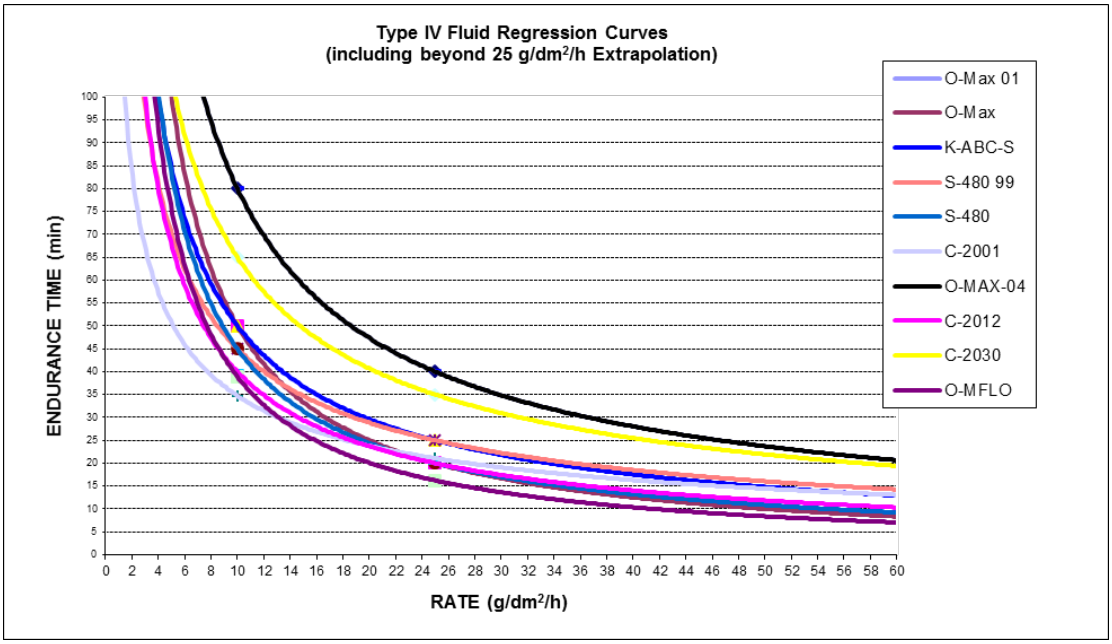

Figure 8.1: Type IV Fluid Regression Curves in Snow (Neat Fluid, -3°C to -14°C) including 25 g/dm^2/h

9. FROST, FREEZING FOG, SNOW PELLETS AND ICE CRYSTAL PRECIPITATION RATES AND HOLDOVER TIMES

This chapter contains an account of tests conducted in previous winter seasons to collect frost, fog deposition rates, snow pellets endurance times, and ice crystals rates in natural conditions.

9.1 Measurement of Frost Deposition Rates in Natural Conditions

Frost deposition rate measurements were conducted in three previous test seasons. During the first two seasons, the winters of 2001-02 and 2002-03, APS conducted tests to establish test parameters that reflect natural environment conditions for active frost. Rates of natural frost accretion were documented to enable specification of frost intensity for fluid endurance time testing. The rates were measured using an insulated white-painted aluminum surface that was found to be representative of aircraft wing surfaces.

In the last of the three test seasons, the winter of 2003-04, APS conducted frost endurance tests outdoors using insulated white-painted aluminum surfaces. The rates of frost accretion were documented.

The data collected during these winters was analysed in an attempt to determine the expected icing intensities in a natural environment. A full account of the frost deposition rates that were measured during frost testing, along with the results and analysis of the data collected, can be found in Section 5 of the TC report, TP 14375E, *Winter Weather Impact on Holdover Time Table Format (1995-2004)*, (2).

9.2 Study to Quantify Freezing Fog Deposition Rates

Natural freezing fog deposition rate measurements were conducted during previous test seasons. It was concluded that current HOT table precipitation rate limits of 2 and 5 g/dm^2/h are conservative, with rates measured during actual fog conditions closer to 1 g/dm^2/h. For a detailed account of testing from previous years, refer to TC report, TP 13993E, *Impact of Winter Weather on Holdover Time Table Format (1995-2002)*, (3).

9.3 Study to Quantify Snow Pellets

Comparative tests to confirm that HOT guidelines can be expanded to include snow pellets in the current snow HOT column were conducted in 2009-10. A full account of this testing can be found in Section 8 of the TC report, TP 15053E, *Aircraft Ground Icing Research General Activities During the 2009-10 Winter* (20).

9.4 Study to Quantify Ice Crystals

In 2012-13, ice crystal precipitation data were collected at three northern Canadian locations to document active ice crystal precipitation rates. It was determined that freezing fog holdover times can be used for ice crystal precipitation. An account of this research can be found in the TC Report, TP 15230, *Aircraft Ground Icing Research General Activities During the Winter 2012-13* (21).

In 2013-14, further data were collected. An account of this research can be found in the TC Report, TP 15269E, *Aircraft Ground Icing Research General Activities During The 2013-14 Winter* (22).

10. CONCLUSIONS

Several conclusions can be drawn from the winter weather data that has been collected and analysed:

a) Snow: Natural snow data collected over twelve winters has led to the refinement of the snow precipitation intensity rate and temperature breakdowns in the holdover time tables;

b) Frost: The survey of winter operations at a number of airports worldwide showed that frost is the second most frequent type of deicing operation, and therefore sufficient attention was given to investigating and substantiating frost holdover times. A separate activity with the objective of substantiating frost holdover times was completed as part of the overall R&D Program;

c) Freezing Rain/Drizzle: The limited data collected to date has shown that the temperature ranges and precipitation rates used for freezing rain and freezing drizzle in the HOT tables are adequate; and

d) Ice Pellets and Mixed Conditions: A methodology has been developed to evaluate ice pellet and mixed precipitation condition data; however, more data is required to properly characterize these conditions and to further develop appropriate allowance times.

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11. RECOMMENDATIONS

Over the years there have been changes in the availability of the data from the weather stations currently used. Weather data from several stations has been discontinued. It is recommended that work be done to replenish the pool of data sources used in putting together this report.

Additionally, as a robust database for winter weather data spanning over 10 years has been established it is recommended that this report no longer be issued yearly. Going forward, this report should be completed every 2 years.

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APPENDIX A

TRANSPORTATION DEVELOPMENT CENTRE
WORK STATEMENT EXCERPT
AIRCRAFT & ANTI-ICING FLUID
WINTER TESTING 2014-15

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WINTER TESTING 2014-15

2.1 Evaluation of Winter Weather Data

a) Arrange with Environment Canada to collect data only for freezing drizzle, freezing rain, and ice pellets from six weather stations in Quebec. In addition, NCAR may potentially provide freezing precipitation related data that could be used for analysis;

b) Conduct additional research into the determination of precipitation rates of ice pellets occurring in mixed conditions, to better define current operational limitations in ice pellet conditions;

c) Analyze the data collected;

d) Provide any resulting recommendations that may have an impact on the Holdover Time (HOT) table format; and

e) Prepare a report every two years (2015-16) on the findings.

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APPENDIX B

WINTER WEATHER DATA 1995-96 TO 2014-15

WINTER WEATHER DATA
1995-96 TO 2014-15

The following charts include the complete rate data analysis, subdivided by temperature ranges for both freezing rain and snow. A histogram of points and a cumulative probability chart are included for each rate calculation interval in all temperature ranges.

INDEX

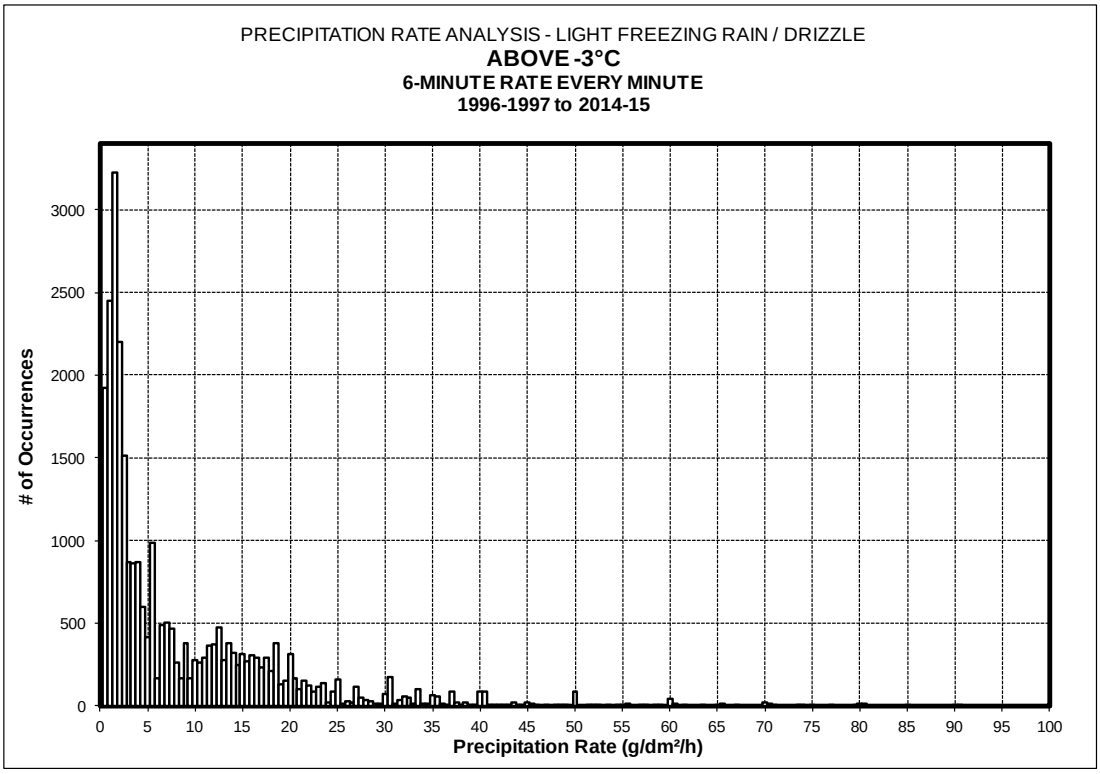
FREEZING RAIN / DRIZZLE (1996-97 to 2014-15)

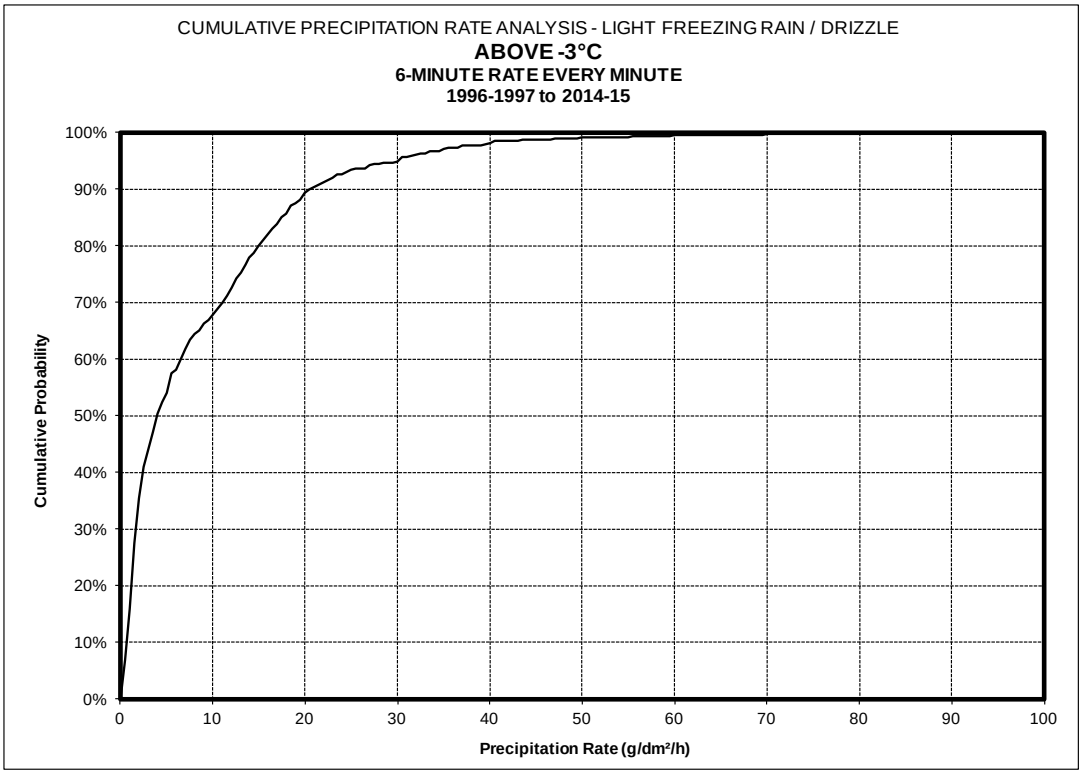
FREEZING RAIN / DRIZZLE MIXED PRECIPITATION

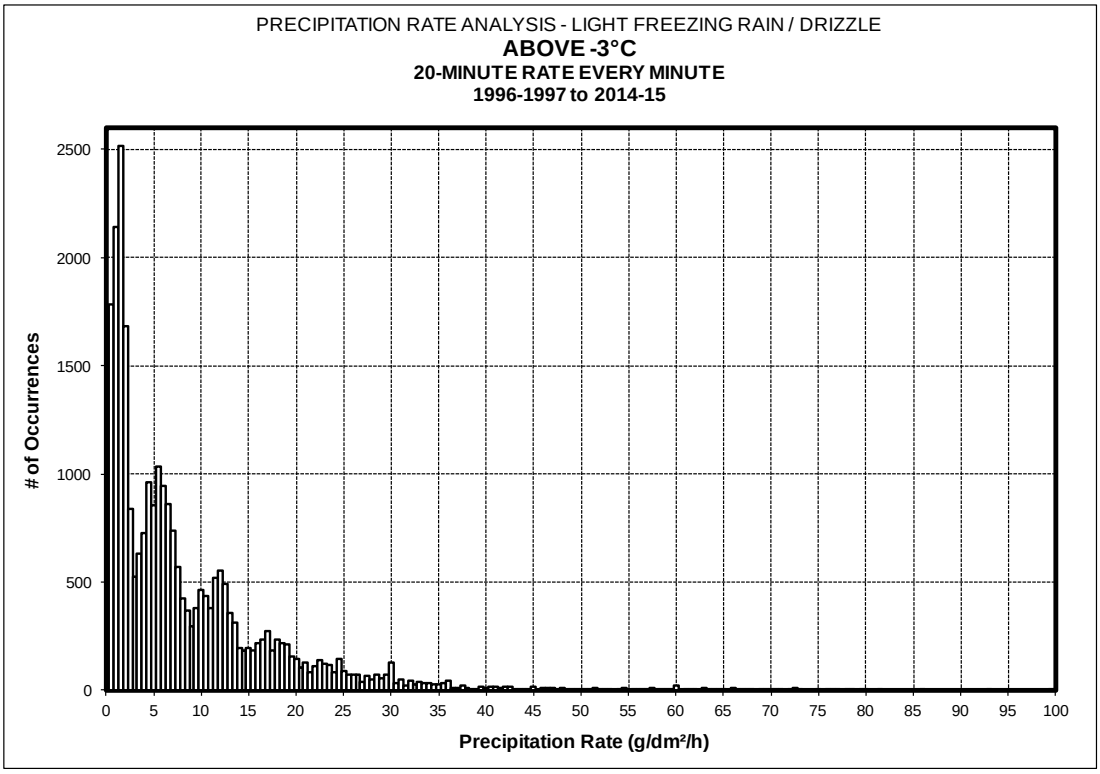
ICE PELLETS (2004-05 to 2014-15)

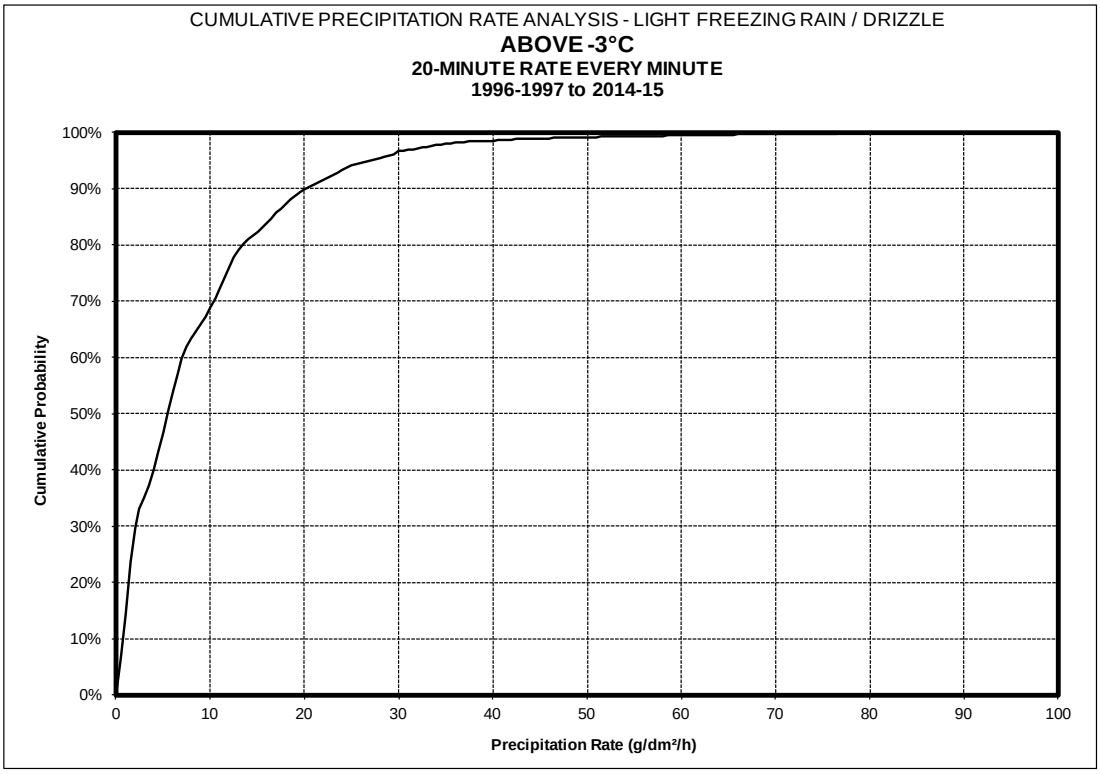
ICE PELLETS MIXED WITH OTHER PRECIPITATION

FREEZING RAIN / DRIZZLE (1996-97 to 2014-15)


PRECIPITATION RATE ANALYSIS - LIGHT FREEZING RAIN / DRIZZLE
ABOVE -3°C
6-MINUTE RATE EVERY MINUTE
1996-1997 to 2014-15
# of Occurrences
0
500
1000
1500
2000
2500
3000
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100
Precipitation Rate (g/dm²/h)


CUMULATIVE PRECIPITATION RATE ANALYSIS - LIGHT FREEZING RAIN / DRIZZLE
ABOVE -3°C
6-MINUTE RATE EVERY MINUTE
1996-1997 to 2014-15
Cumulative Probability
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
0 10 20 30 40 50 60 70 80 90 100
Precipitation Rate (g/dm²/h)


PRECIPITATION RATE ANALYSIS - LIGHT FREEZING RAIN / DRIZZLE
ABOVE -3°C
20-MINUTE RATE EVERY MINUTE
1996-1997 to 2014-15
# of Occurrences
0
500
1000
1500
2000
2500
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100
Precipitation Rate (g/dm²/h)


CUMULATIVE PRECIPITATION RATE ANALYSIS - LIGHT FREEZING RAIN / DRIZZLE
ABOVE -3°C
20-MINUTE RATE EVERY MINUTE
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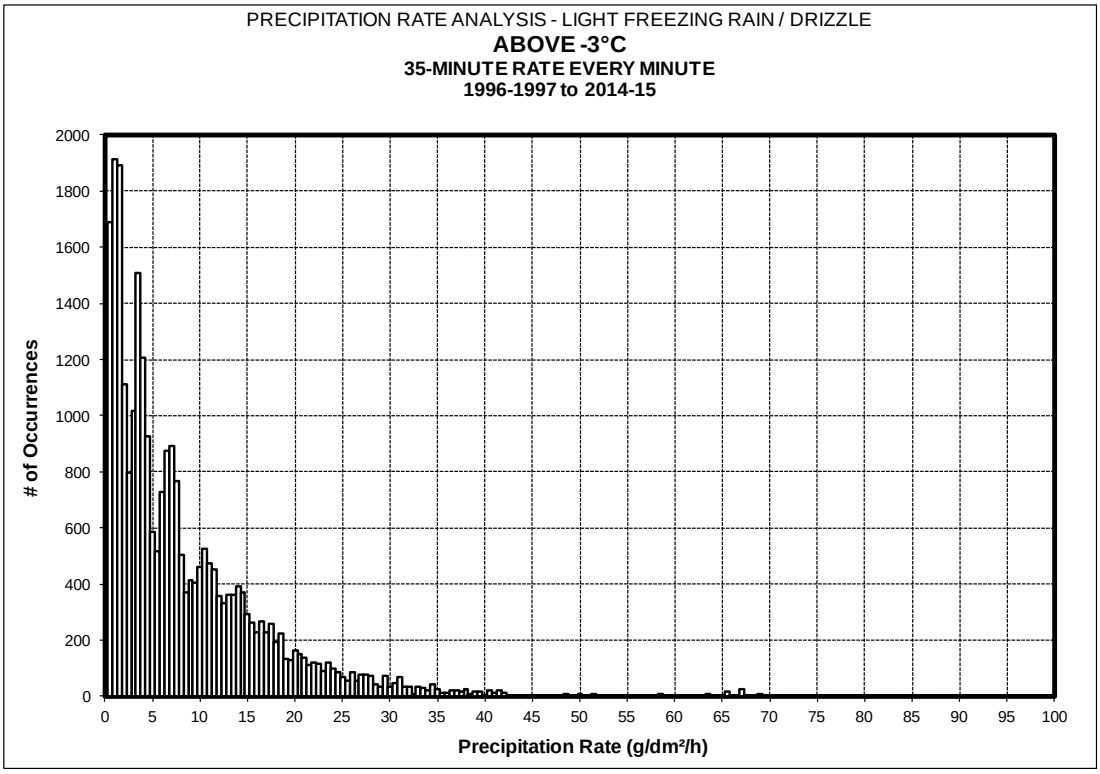
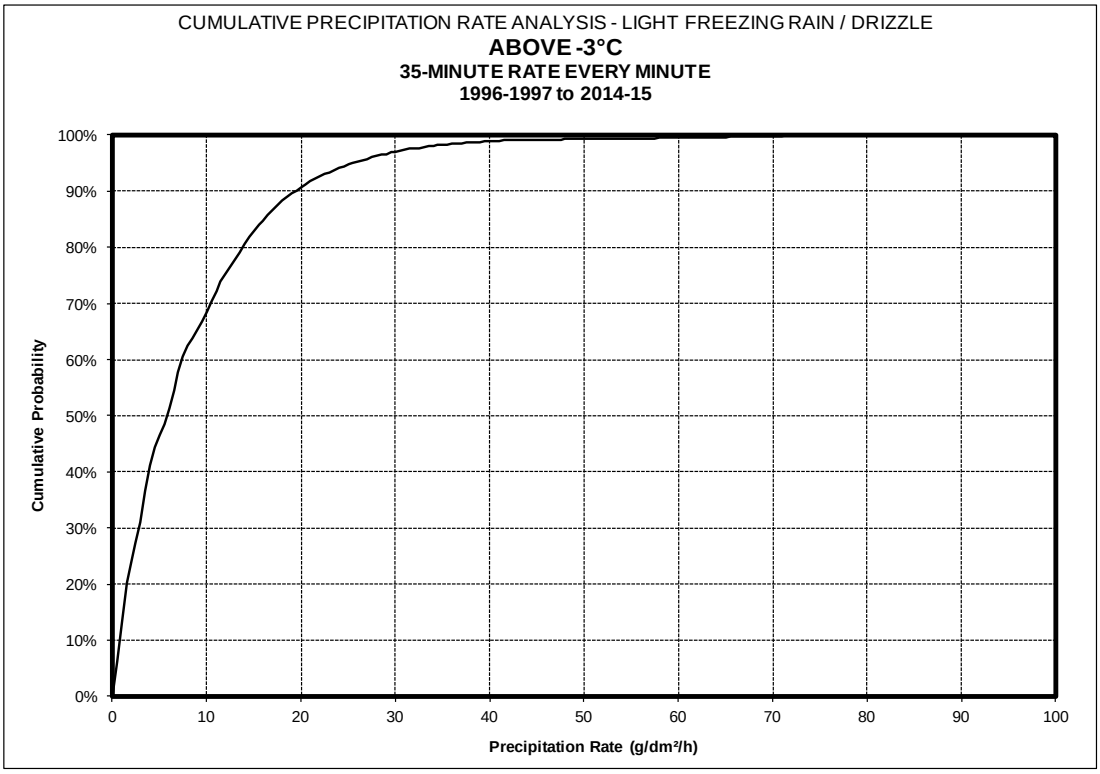
Cumulative Probability
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
0 10 20 30 40 50 60 70 80 90 100
Precipitation Rate (g/dm²/h)


PRECIPITATION RATE ANALYSIS - LIGHT FREEZING RAIN / DRIZZLE
ABOVE -3°C
35-MINUTE RATE EVERY MINUTE
1996-1997 to 2014-15
# of Occurrences
0
200
400
600
800
1000
1200
1400
1600
1800
2000
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100
Precipitation Rate (g/dm²/h)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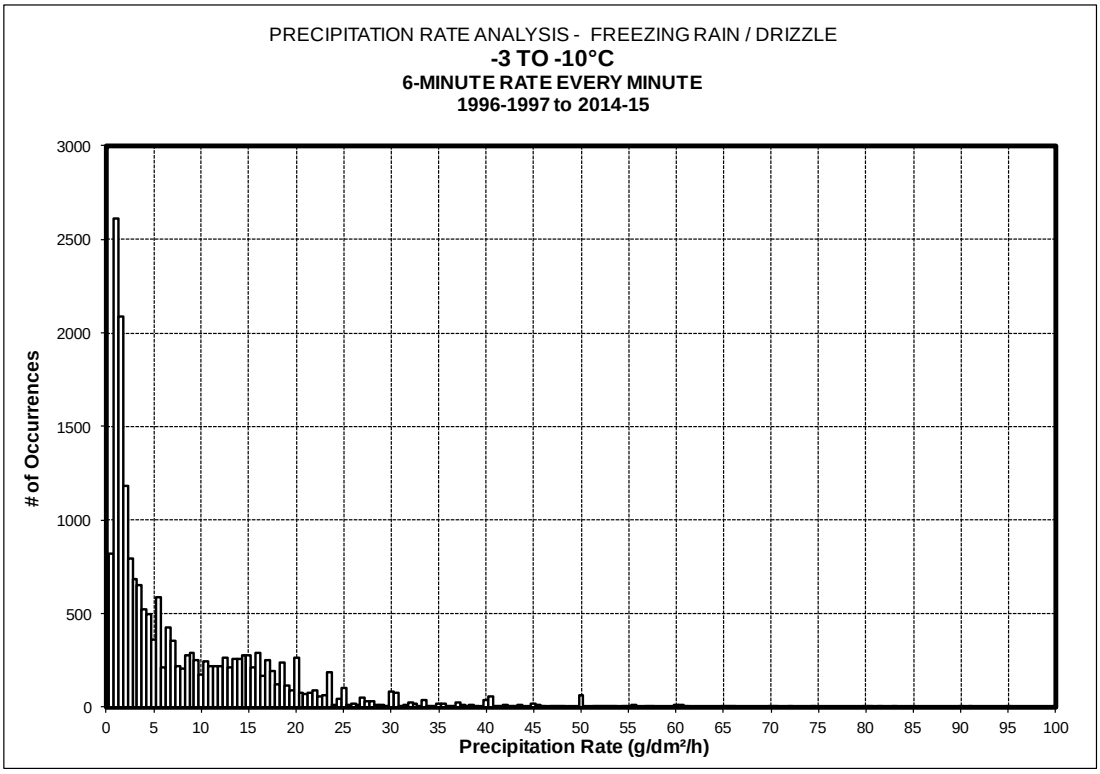
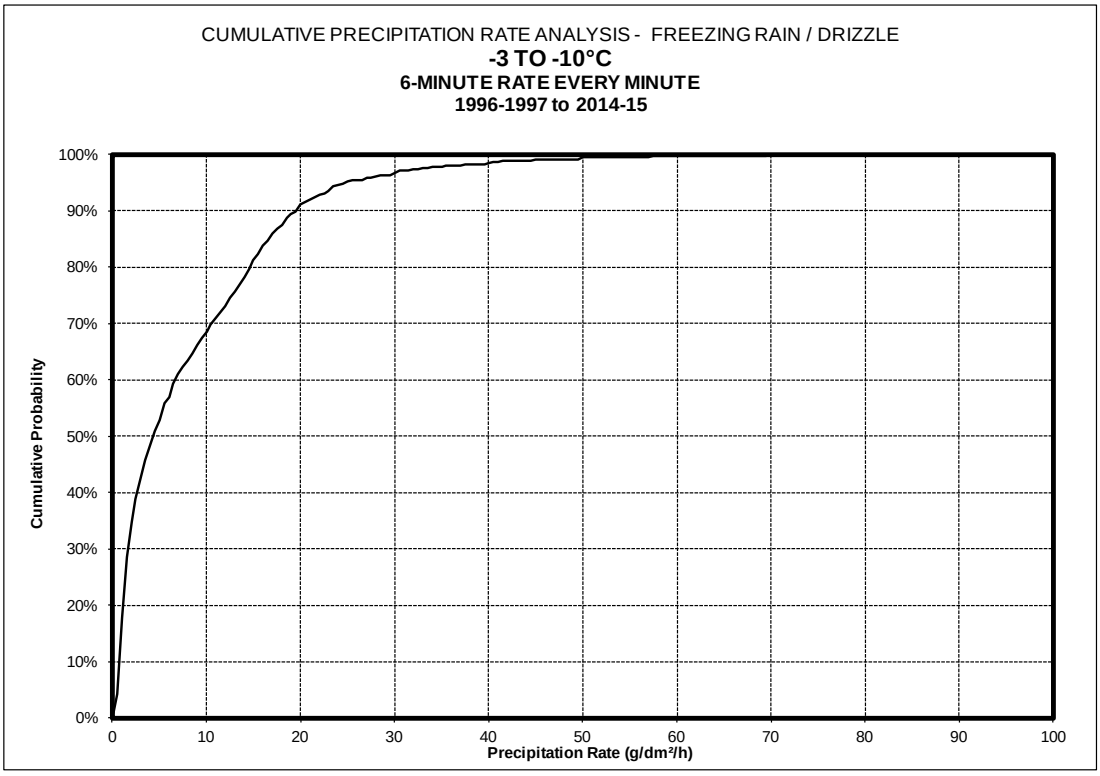
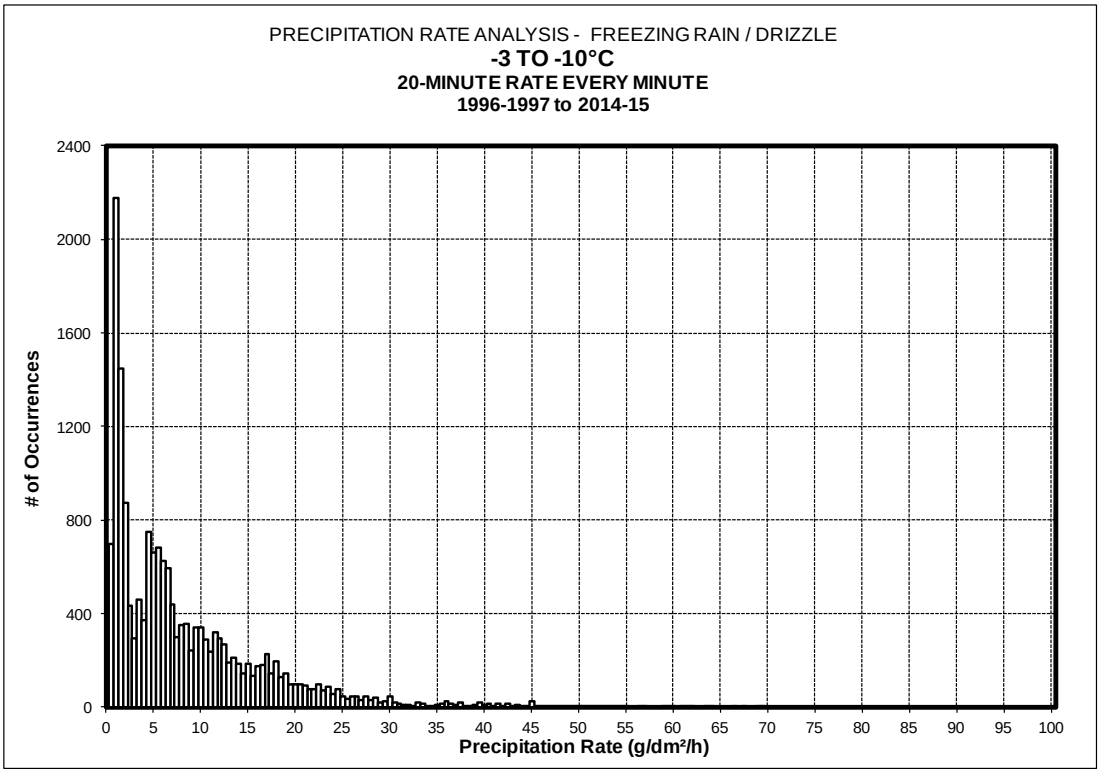
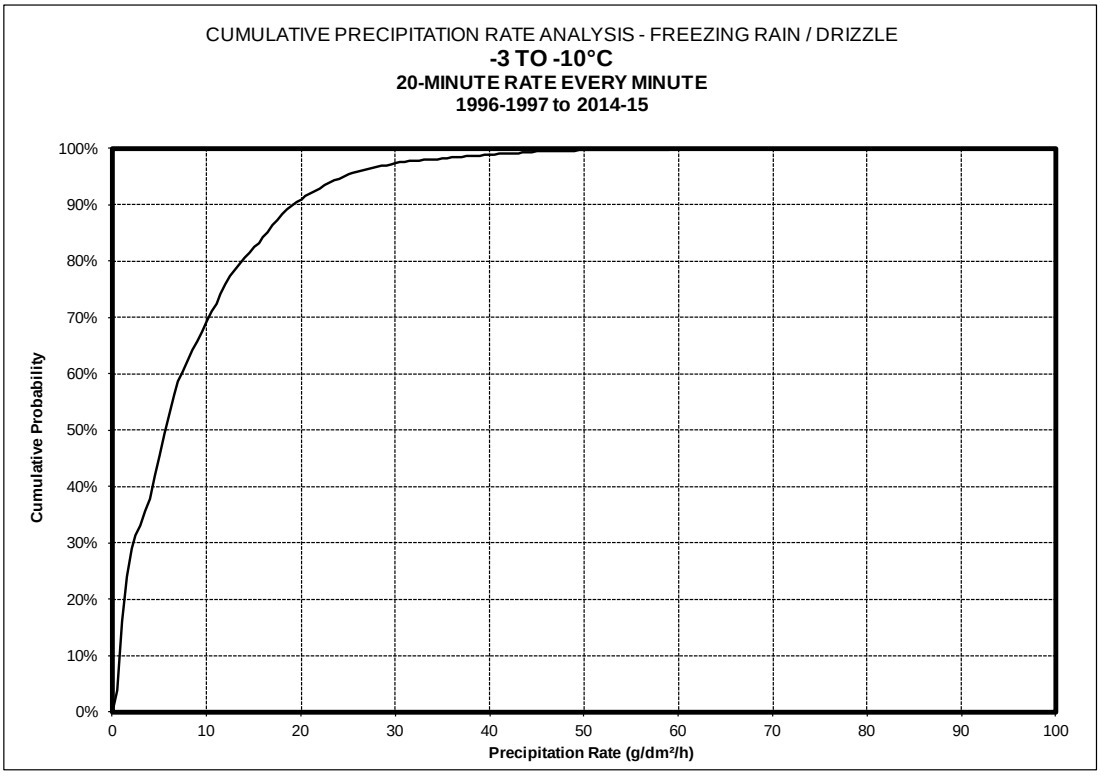

PRECIPITATION RATE ANALYSIS - FREEZING RAIN / DRIZZLE
-3 TO -10°C
6-MINUTE RATE EVERY MINUTE
1996-1997 to 2014-15
# of Occurrences
Precipitation Rate (g/dm²/h)


CUMULATIVE PRECIPITATION RATE ANALYSIS - FREEZING RAIN / DRIZZLE
-3 TO -10°C
6-MINUTE RATE EVERY MINUTE
1996-1997 to 2014-15
Cumulative Probability
Precipitation Rate (g/dm²/h)


PRECIPITATION RATE ANALYSIS - FREEZING RAIN / DRIZZLE
-3 TO -10°C
20-MINUTE RATE EVERY MINUTE
1996-1997 to 2014-15
# of Occurrences
Precipitation Rate (g/dm²/h)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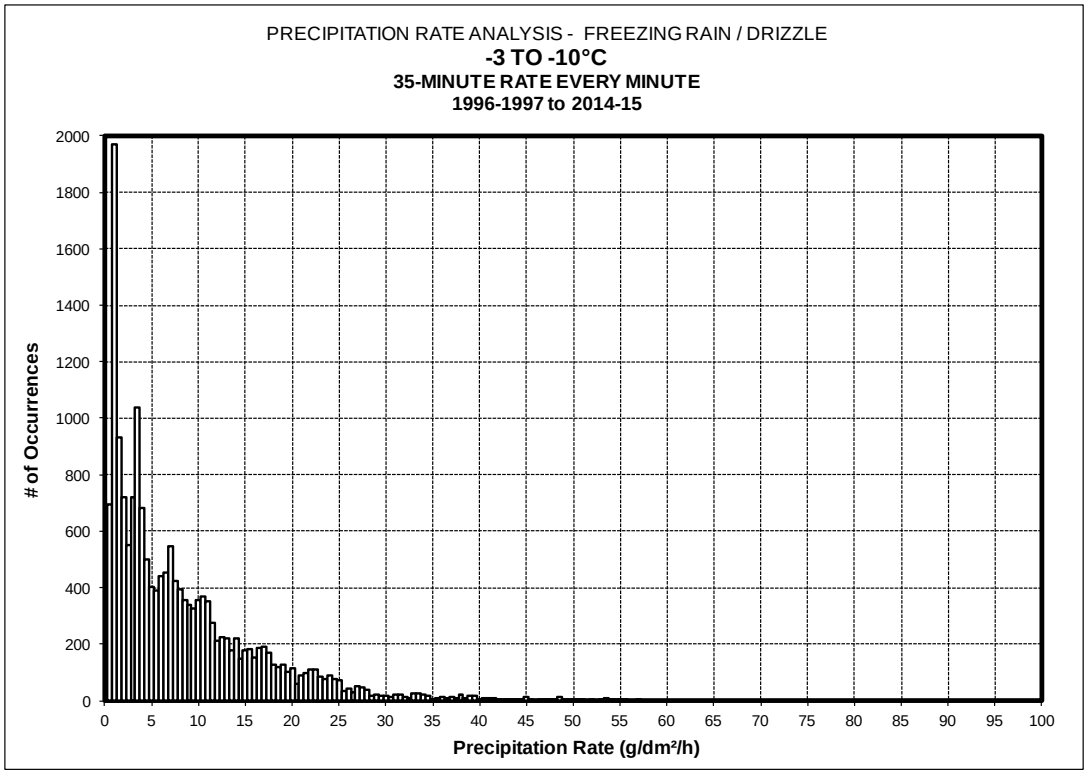
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1996-1997 to 2014-15
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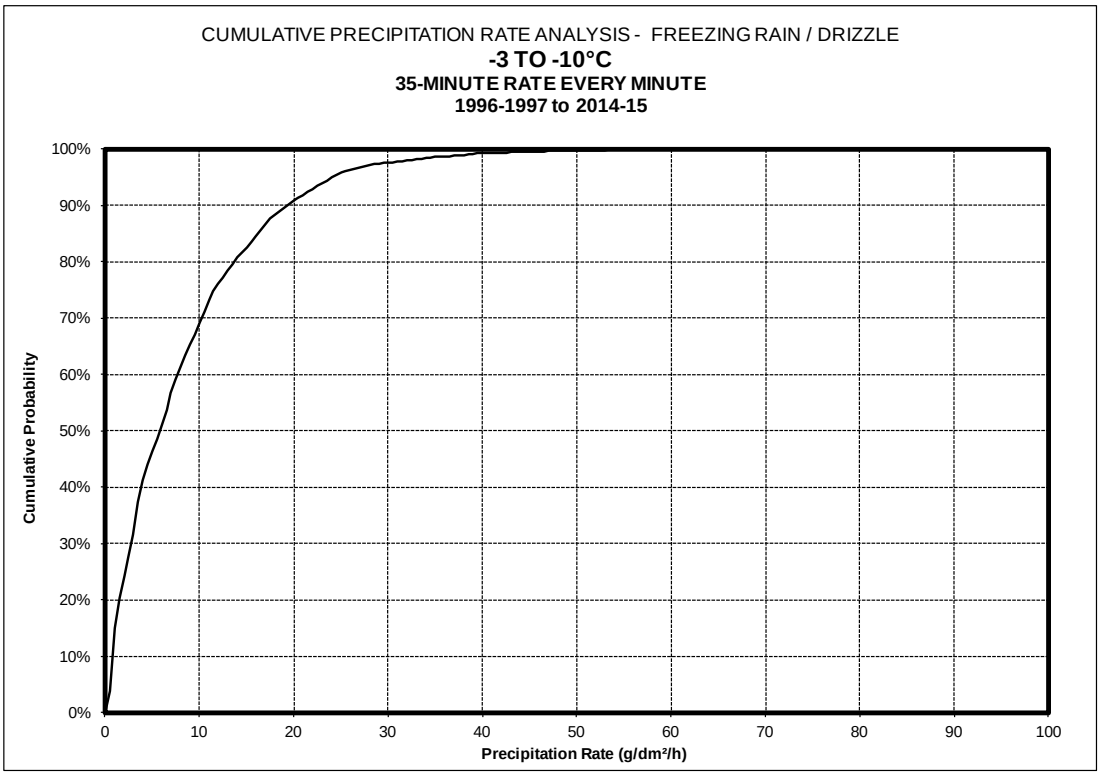
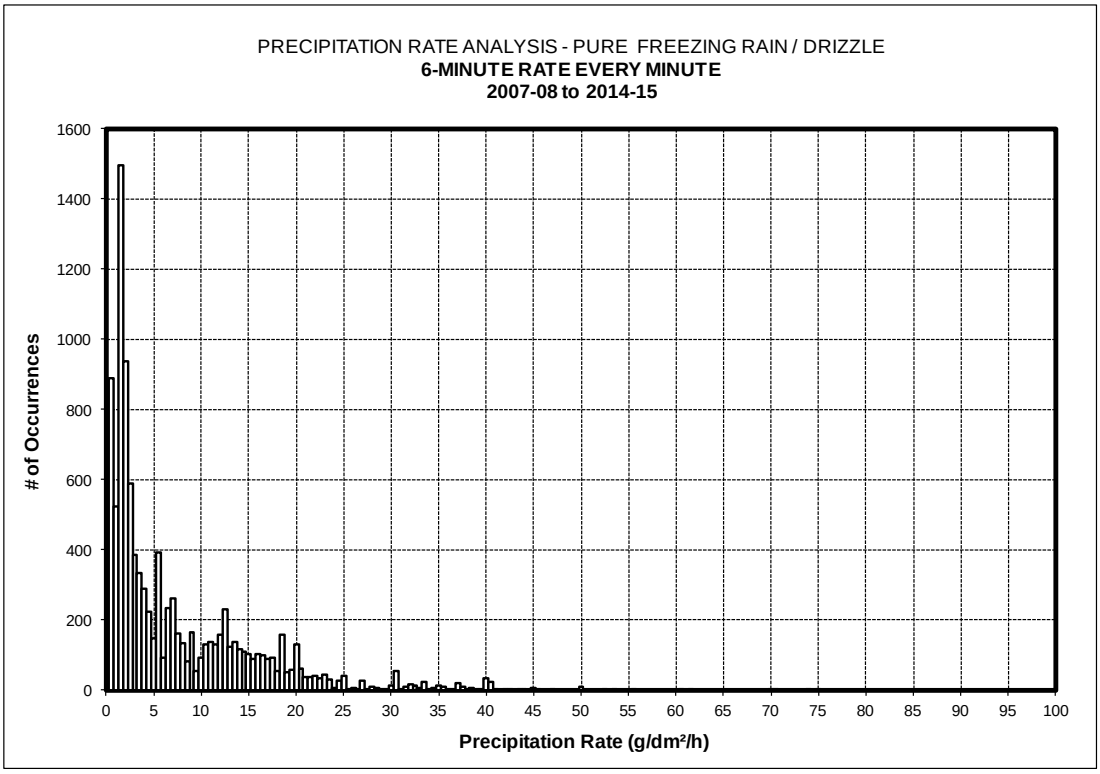
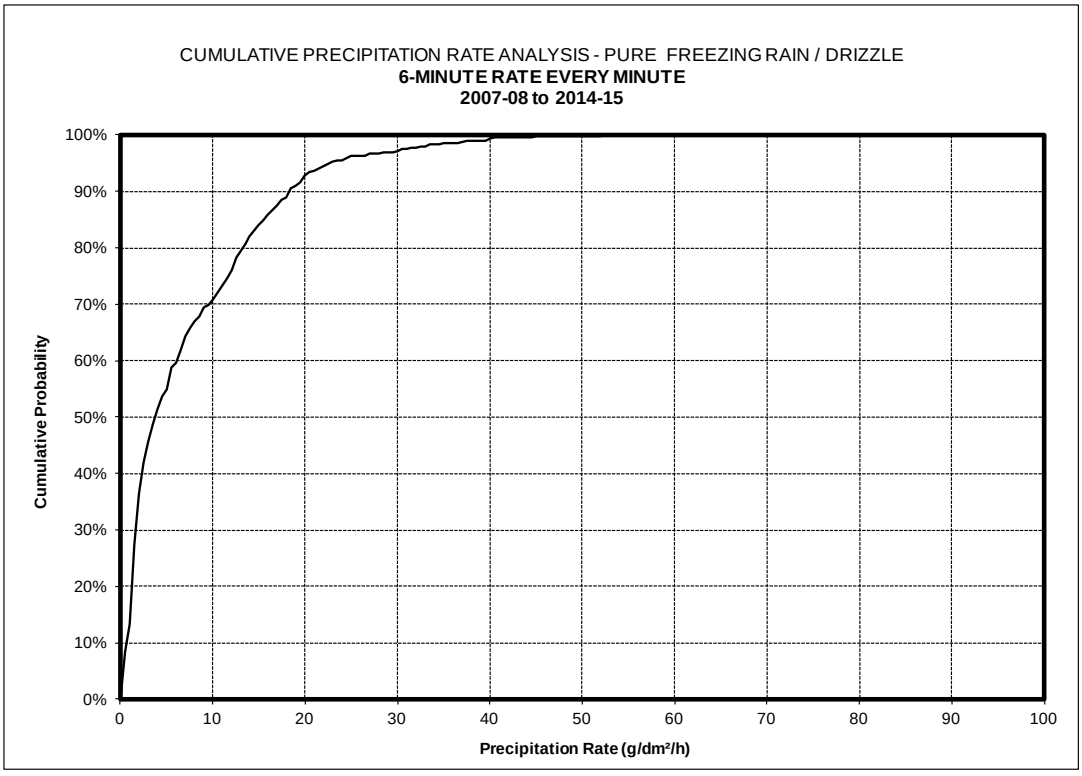
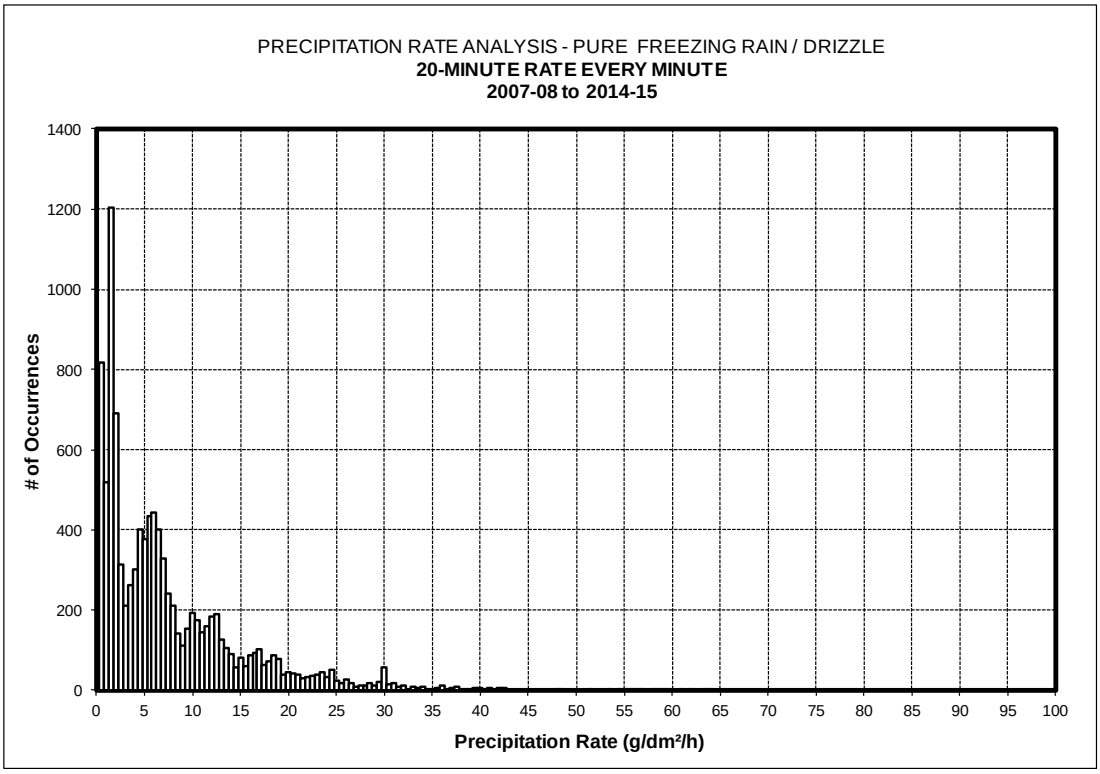
1000
1200
1400
1600
1800
2000
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100
Precipitation Rate (g/dm²/h)


CUMULATIVE PRECIPITATION RATE ANALYSIS - FREEZING RAIN / DRIZZLE
-3 TO -10°C
35-MINUTE RATE EVERY MINUTE
1996-1997 to 2014-15
Cumulative Probability
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
0 10 20 30 40 50 60 70 80 90 100
Precipitation Rate (g/dm²/h)

FREEZING RAIN / DRIZZLE MIXED PRECIPITATION


PRECIPITATION RATE ANALYSIS - PURE FREEZING RAIN / DRIZZLE
6-MINUTE RATE EVERY MINUTE
2007-08 to 2014-15
# of Occurrences
0
200
400
600
800
1000
1200
1400
1600
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100
Precipitation Rate (g/dm²/h)


CUMULATIVE PRECIPITATION RATE ANALYSIS - PURE FREEZING RAIN / DRIZZLE
6-MINUTE RATE EVERY MINUTE
2007-08 to 2014-15
Cumulative Probability
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
0 10 20 30 40 50 60 70 80 90 100
Precipitation Rate (g/dm²/h)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# of Occurrences
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200
400
600
800
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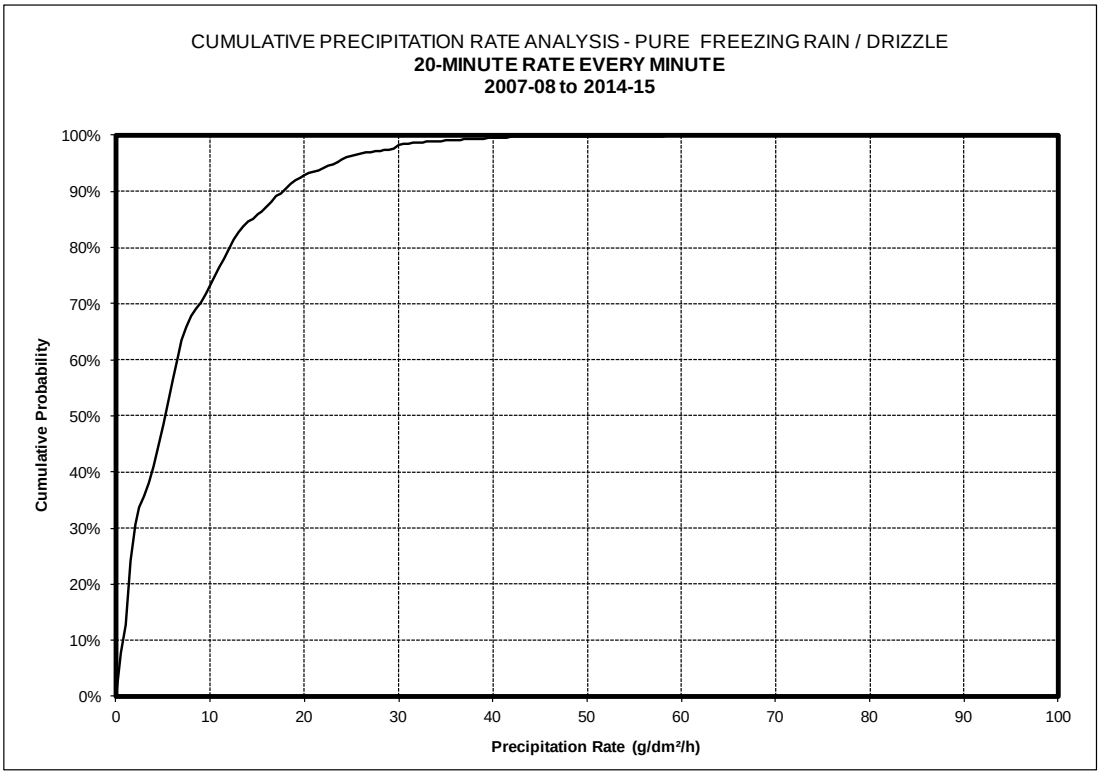
1200
1400
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100
Precipitation Rate (g/dm²/h)


CUMULATIVE PRECIPITATION RATE ANALYSIS - PURE FREEZING RAIN / DRIZZLE
20-MINUTE RATE EVERY MINUTE
2007-08 to 2014-15
Cumulative Probability
0%
10%
20%
30%
40%
50%
60%
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90%
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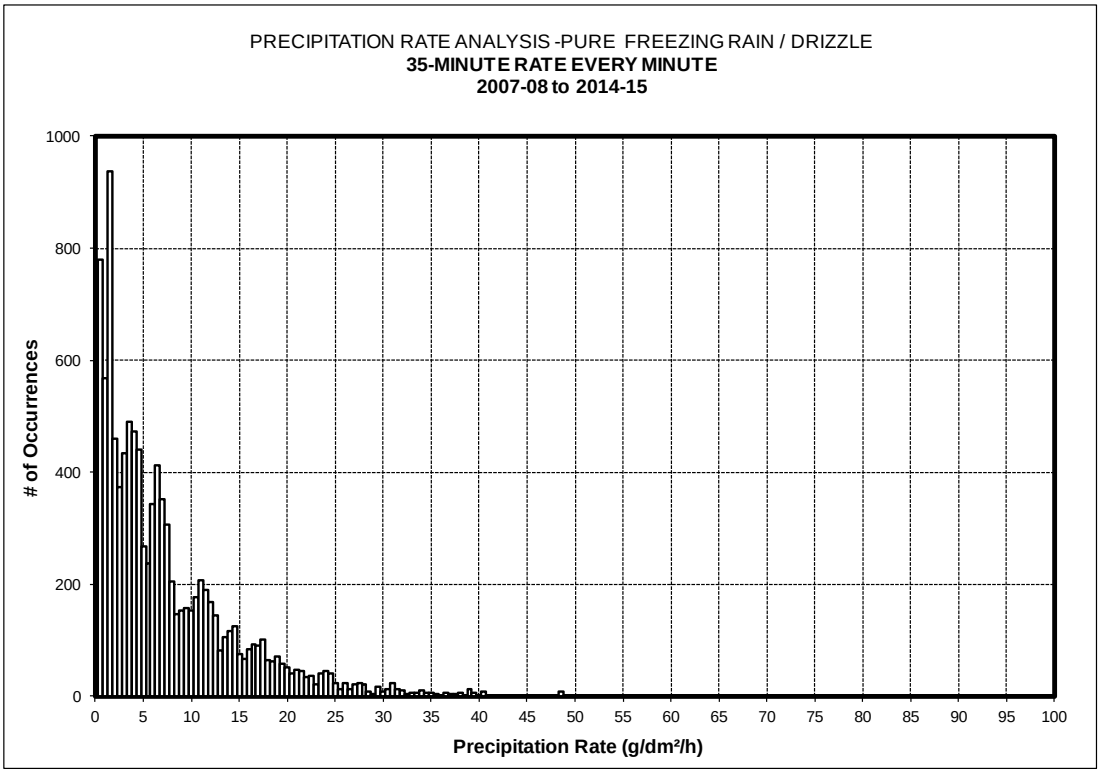
0 10 20 30 40 50 60 70 80 90 100
Precipitation Rate (g/dm²/h)


PRECIPITATION RATE ANALYSIS -PURE FREEZING RAIN / DRIZZLE
35-MINUTE RATE EVERY MINUTE
2007-08 to 2014-15
# of Occurrences
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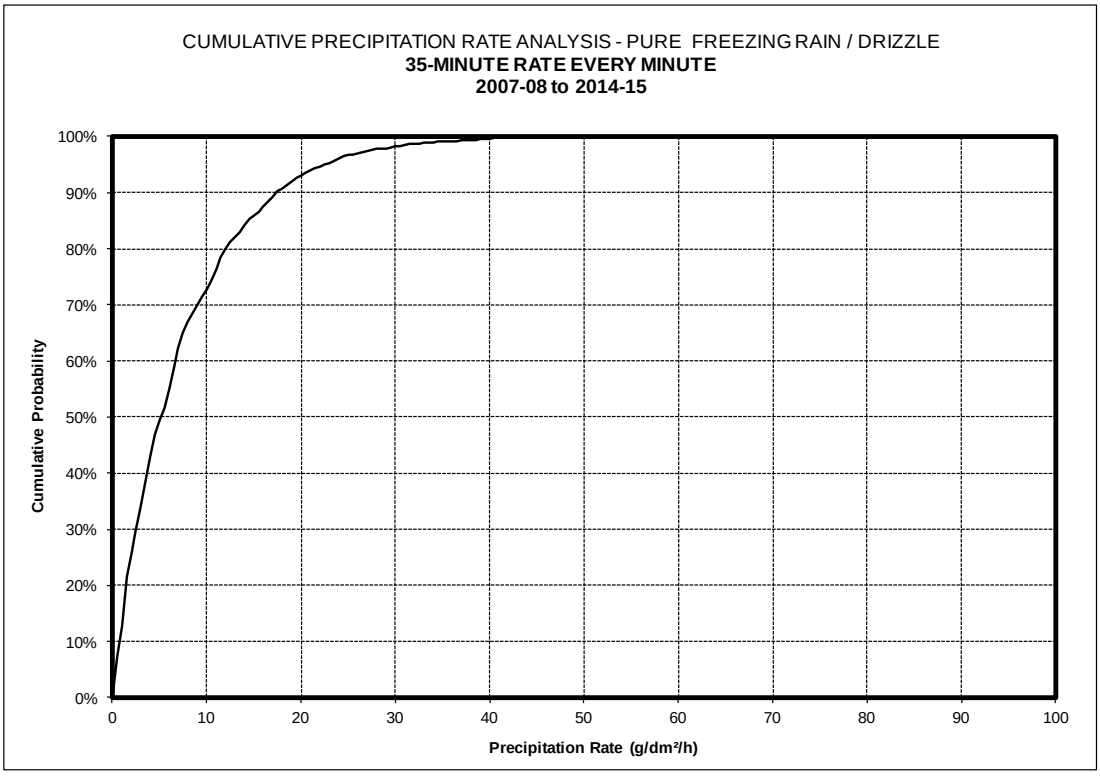
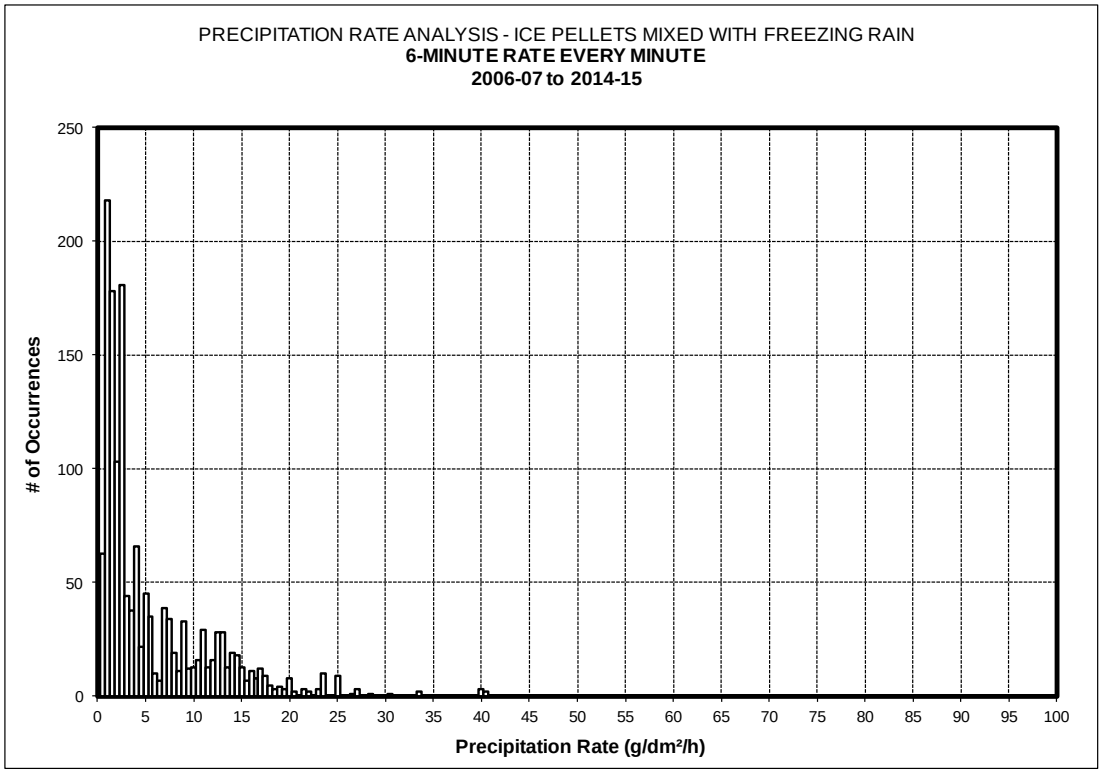
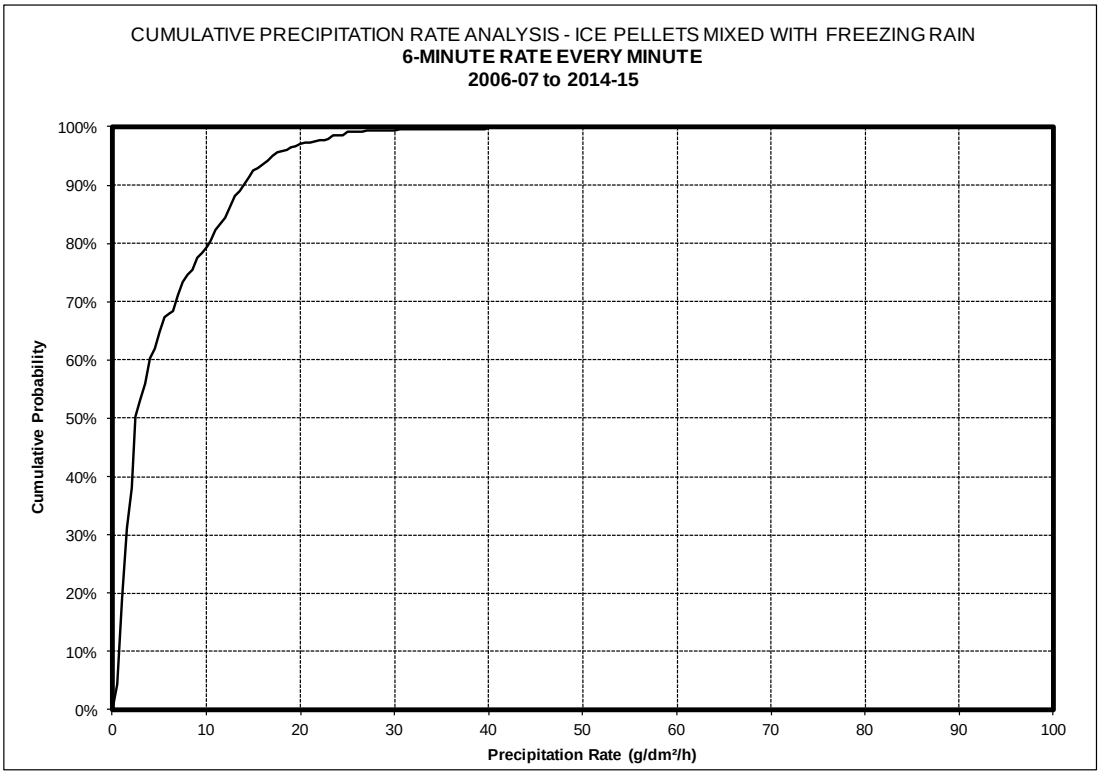
200
400
600
800
1000
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100
Precipitation Rate (g/dm²/h)


CUMULATIVE PRECIPITATION RATE ANALYSIS - PURE FREEZING RAIN / DRIZZLE
35-MINUTE RATE EVERY MINUTE
2007-08 to 2014-15
Cumulative Probability
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
0 10 20 30 40 50 60 70 80 90 100
Precipitation Rate (g/dm²/h)


PRECIPITATION RATE ANALYSIS - ICE PELLETS MIXED WITH FREEZING RAIN
6-MINUTE RATE EVERY MINUTE
2006-07 to 2014-15
# of Occurrences
0
50
100
150
200
250
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100
Precipitation Rate (g/dm²/h)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6-MINUTE RATE EVERY MINUTE
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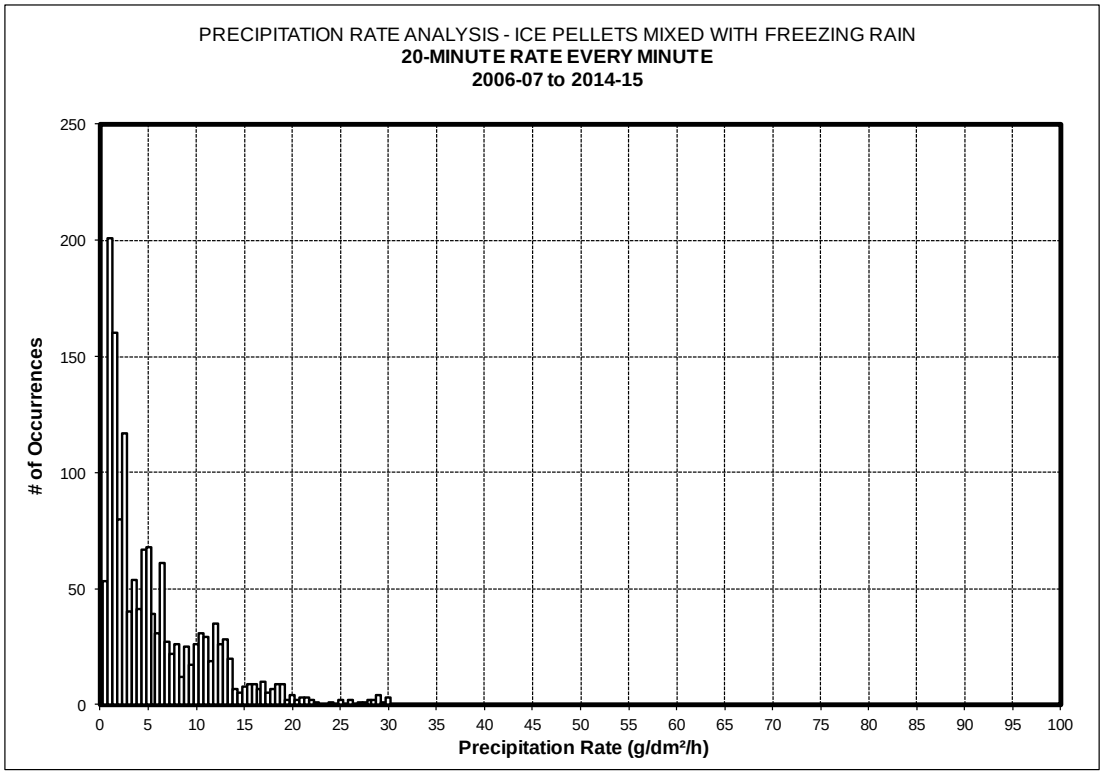
80%
90%
100%
0 10 20 30 40 50 60 70 80 90 100
Precipitation Rate (g/dm²/h)


PRECIPITATION RATE ANALYSIS - ICE PELLETS MIXED WITH FREEZING RAIN
20-MINUTE RATE EVERY MINUTE
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50
100
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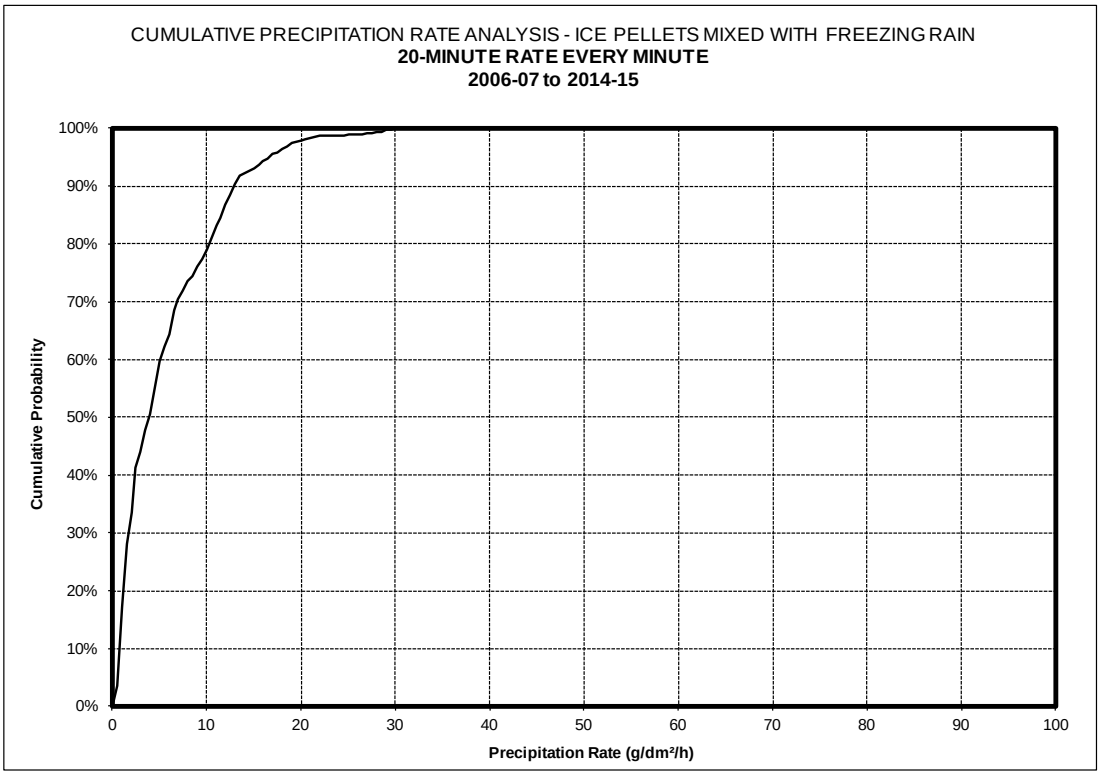
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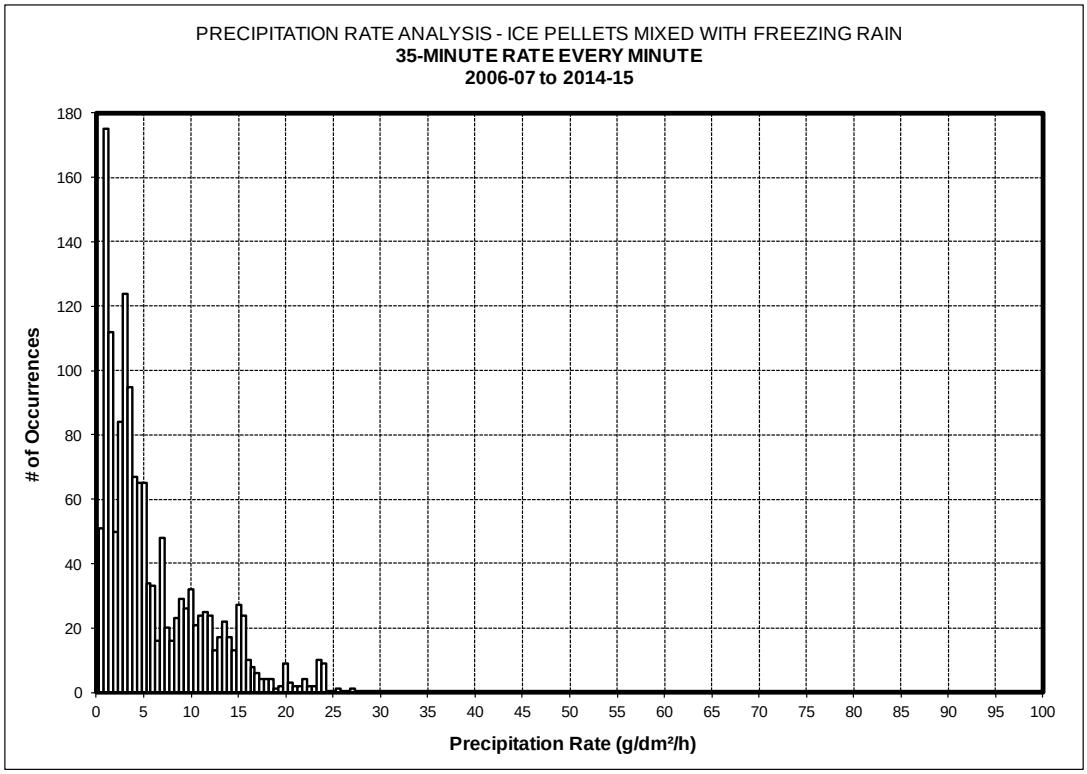
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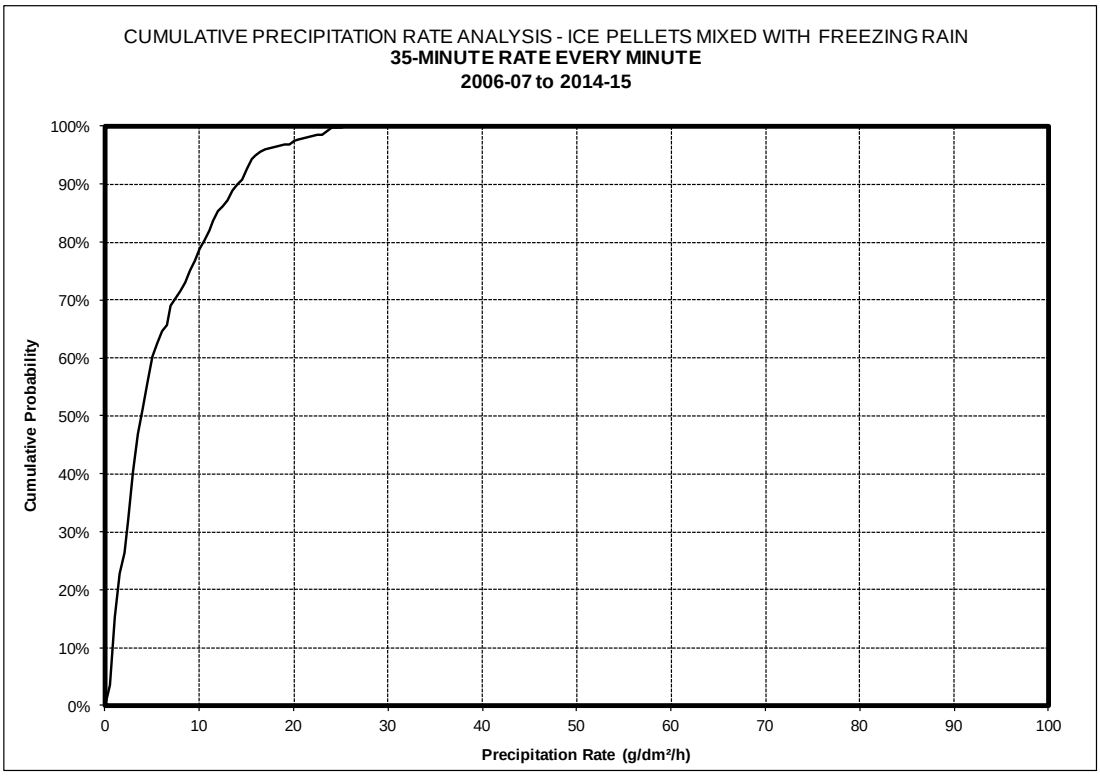
35-MINUTE RATE EVERY MINUTE
2006-07 to 2014-15
# of Occurrences
0
20
40
60
80
100
120
140
160
180
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100
Precipitation Rate (g/dm²/h)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35-MINUTE RATE EVERY MINUTE
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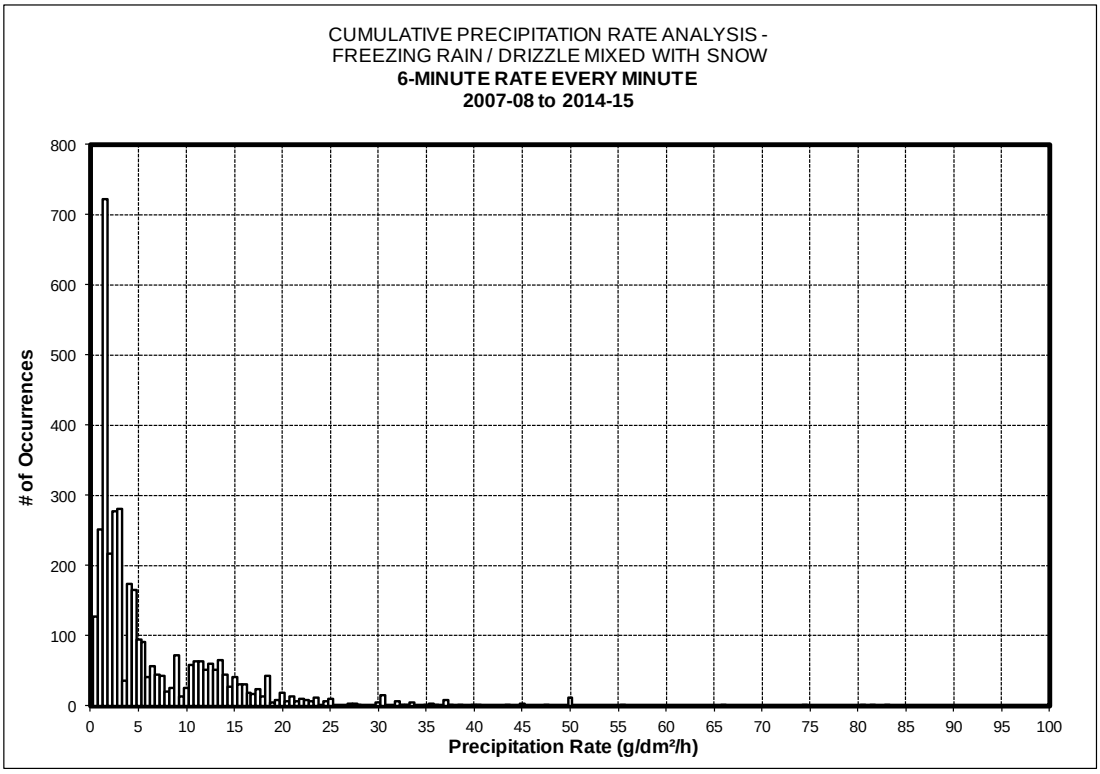
CUMULATIVE PRECIPITATION RATE ANALYSIS -
FREEZING RAIN / DRIZZLE MIXED WITH SNOW
6-MINUTE RATE EVERY MINUTE
2007-08 to 2014-15
# of Occurrences
0
100
200
300
400
500
600
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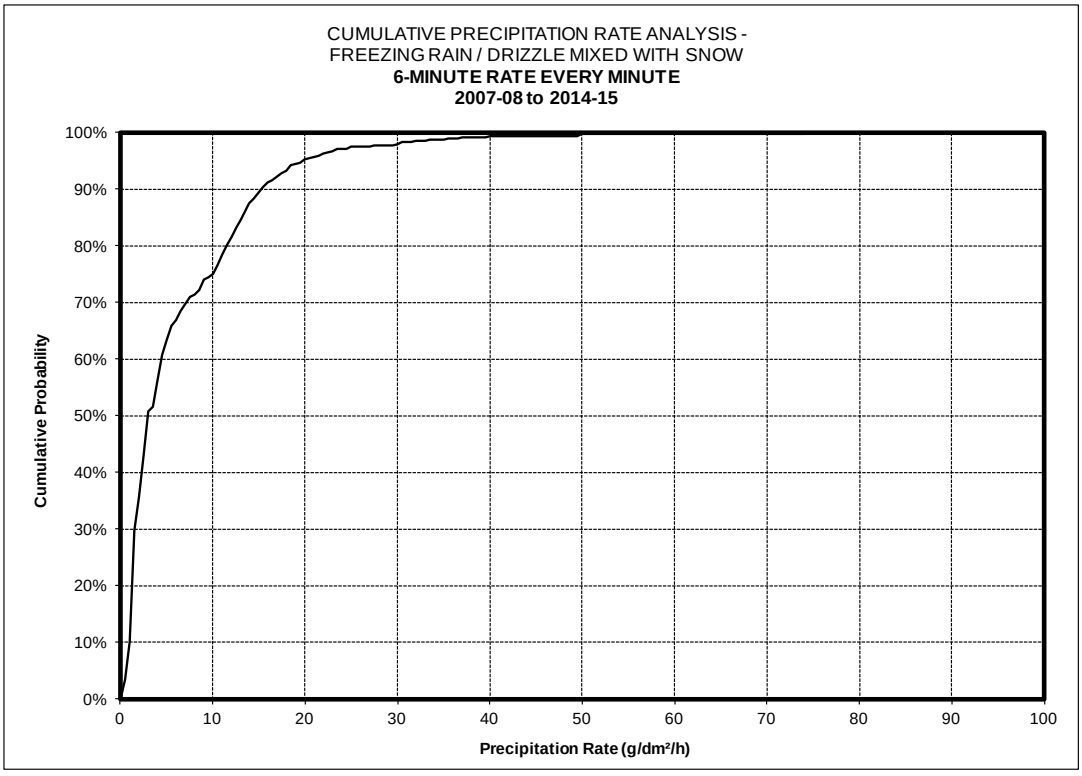
800
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100
Precipitation Rate (g/dm²/h)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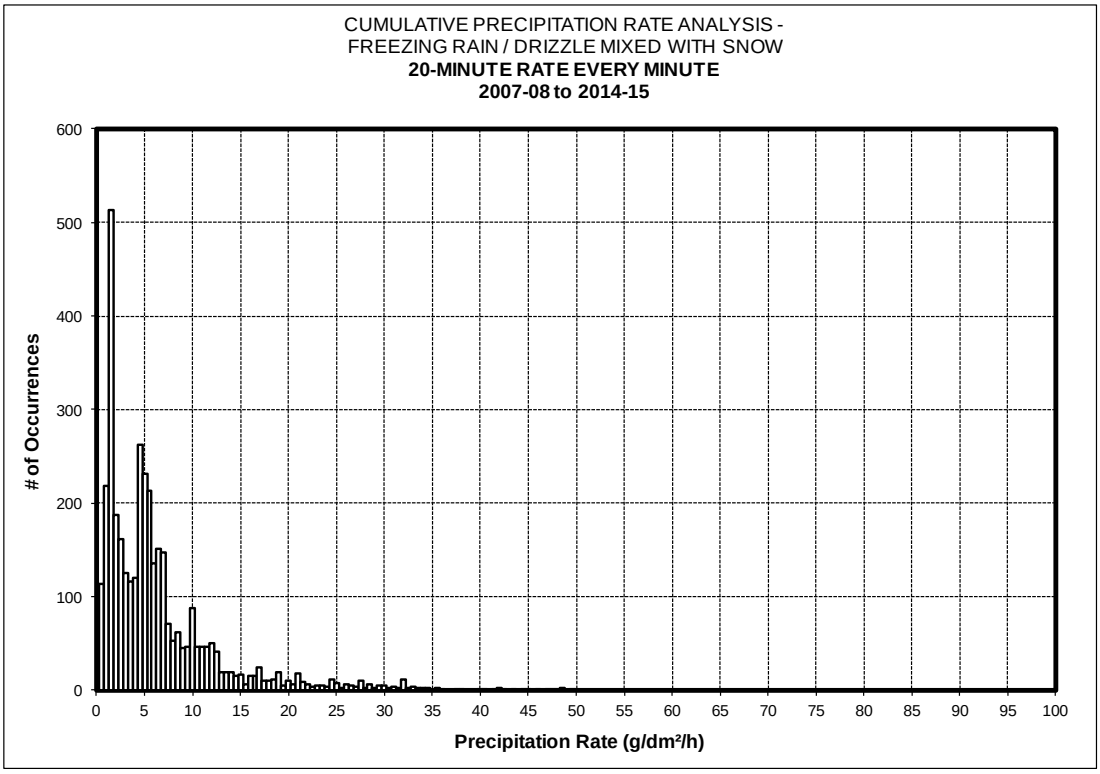
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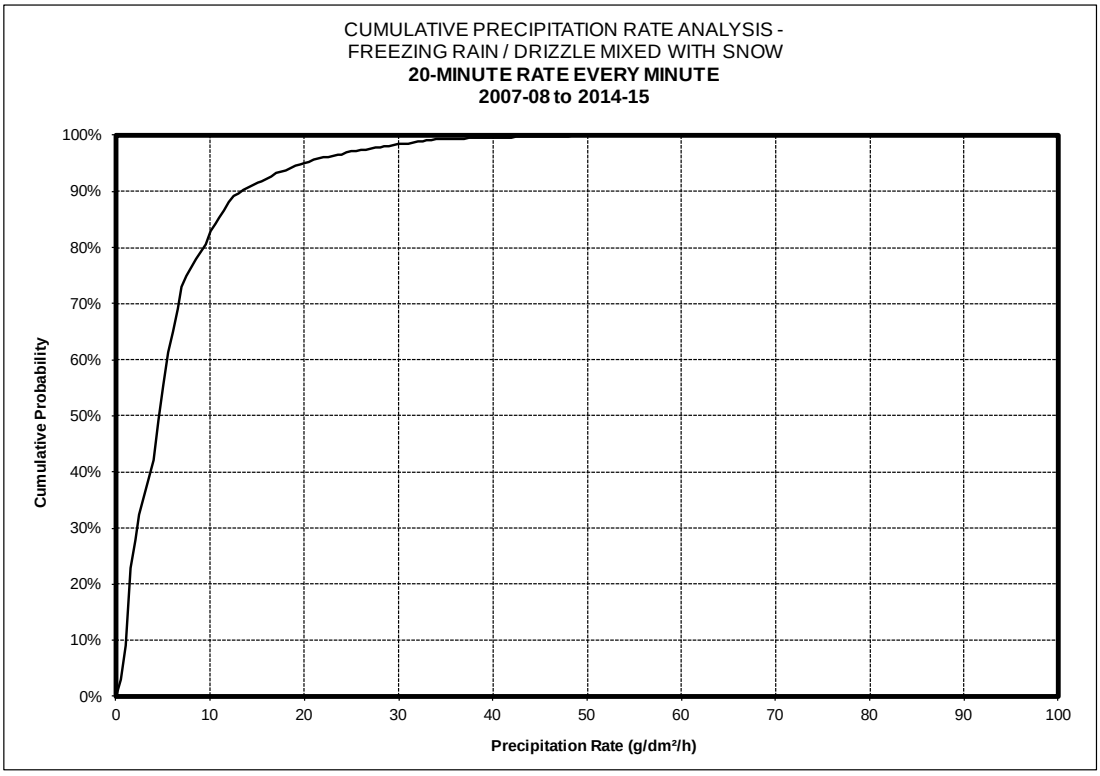
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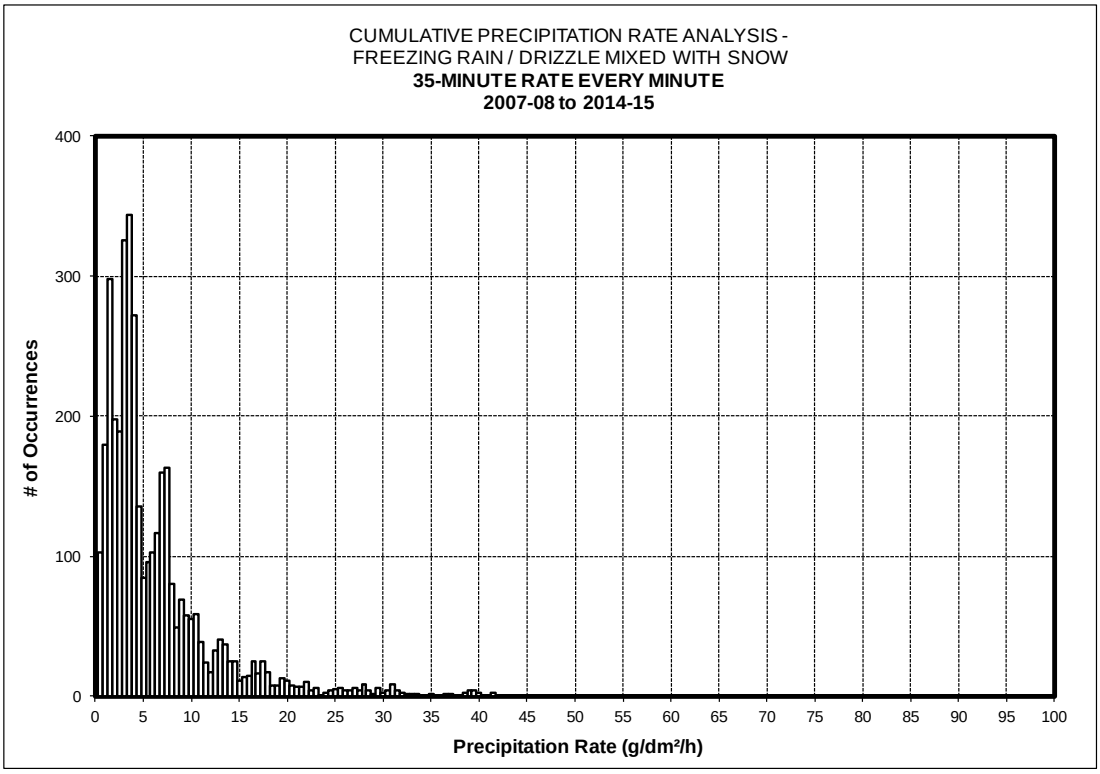
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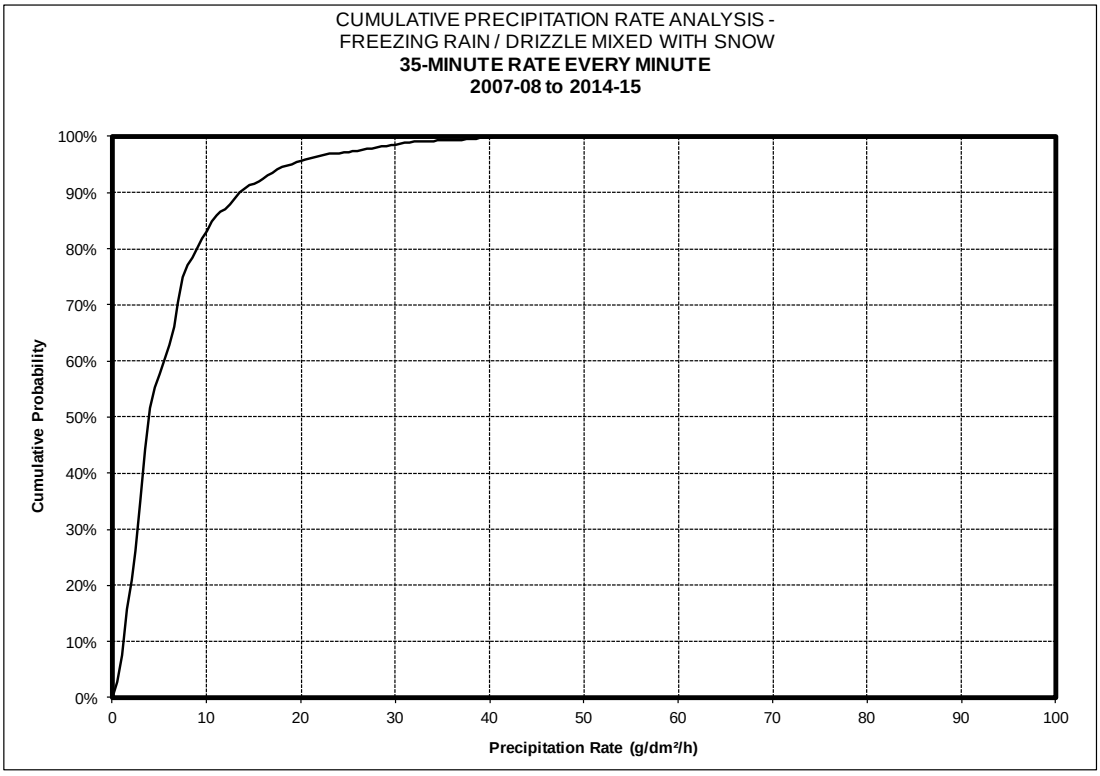
Precipitation Rate (g/dm²/h)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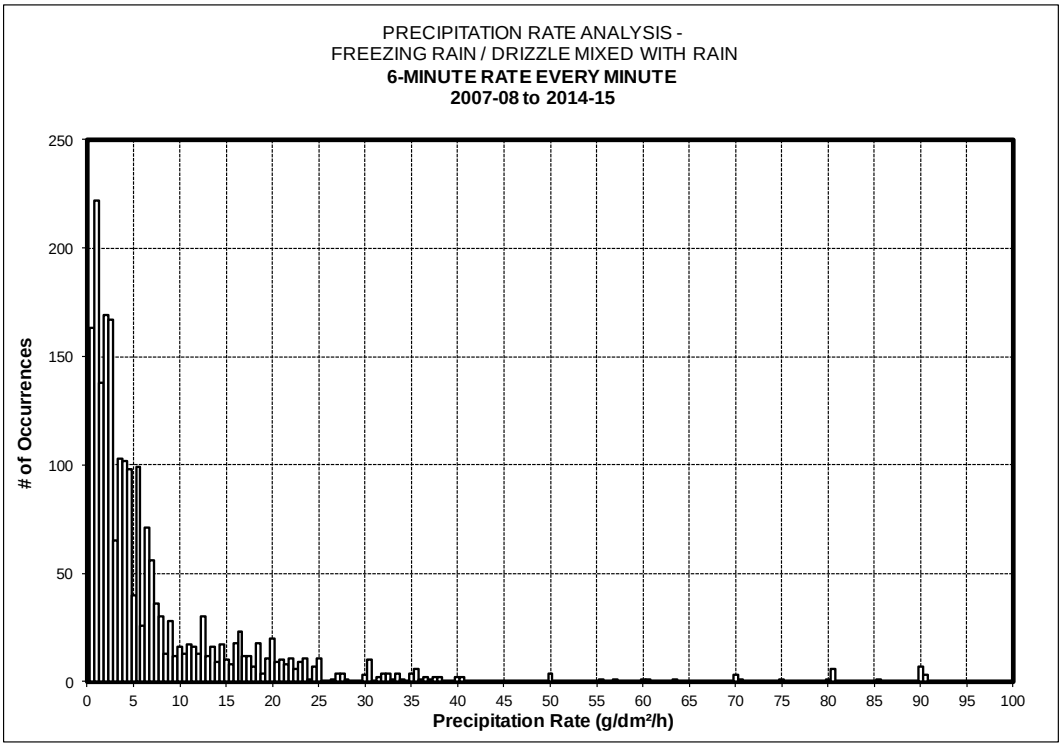
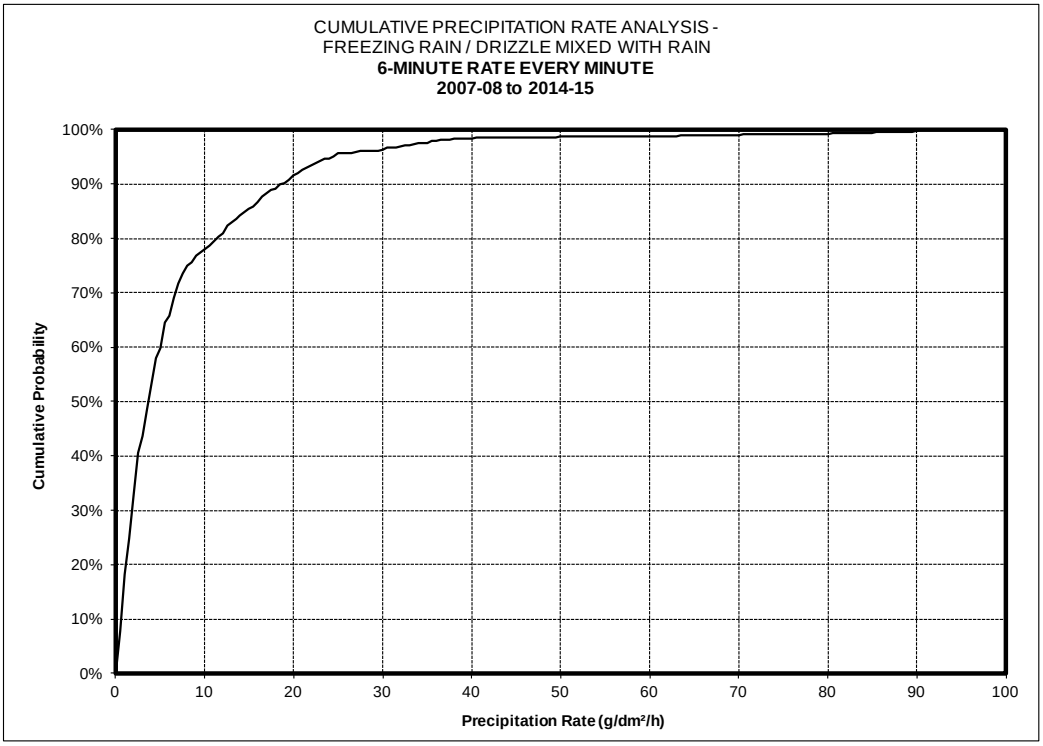
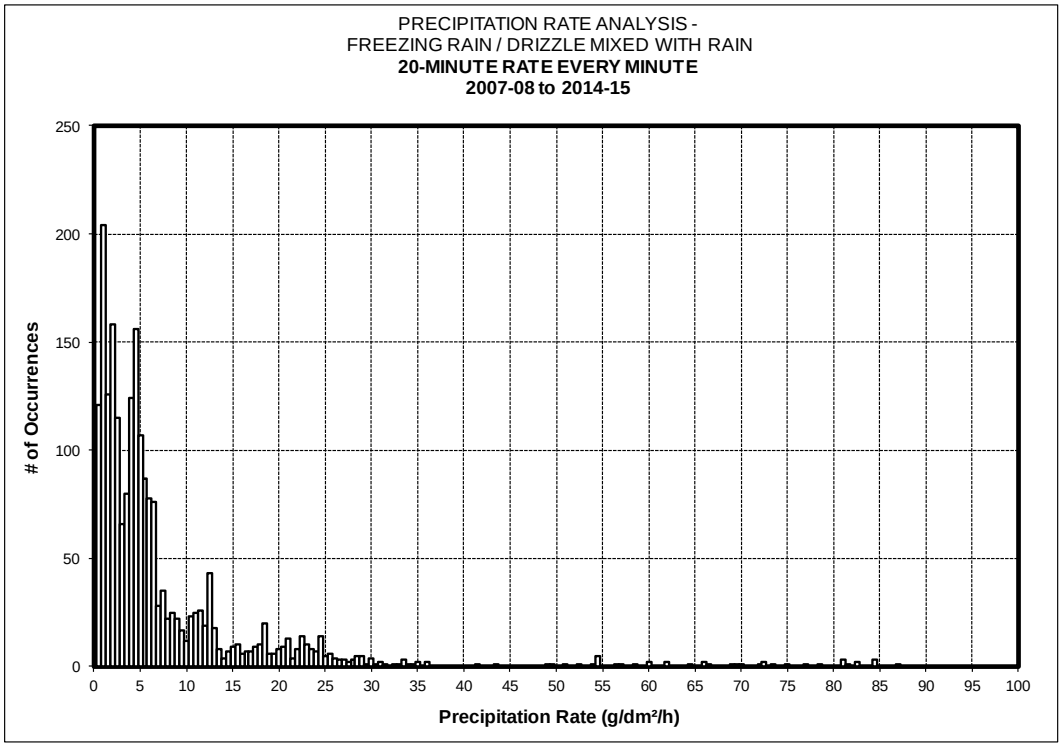
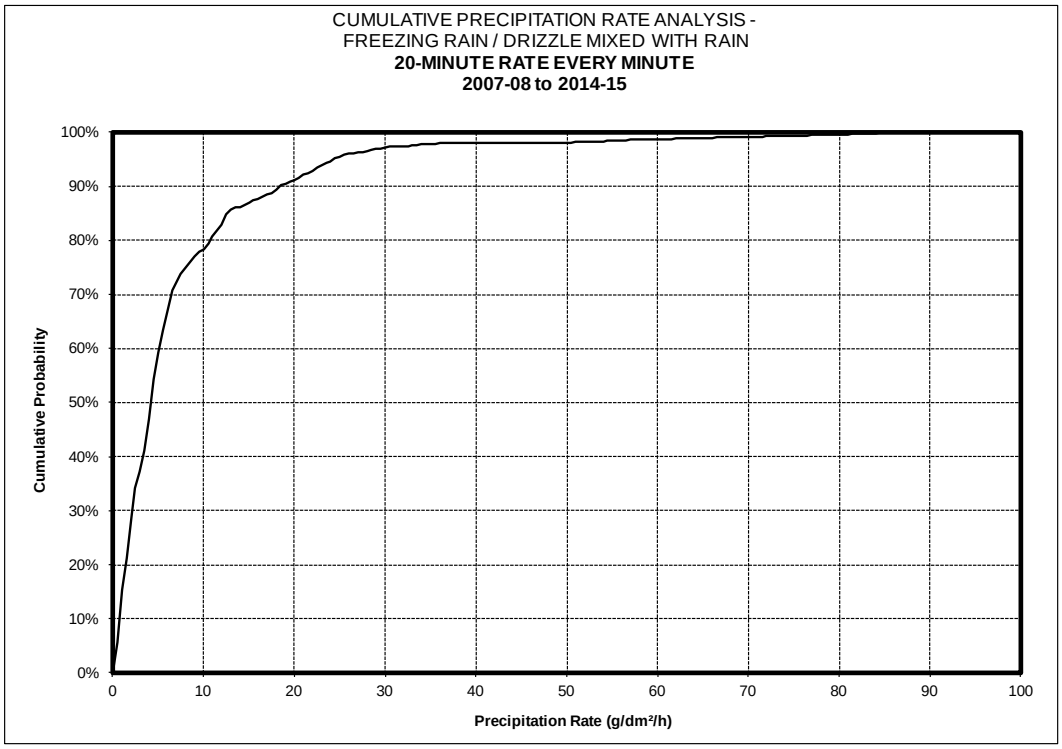
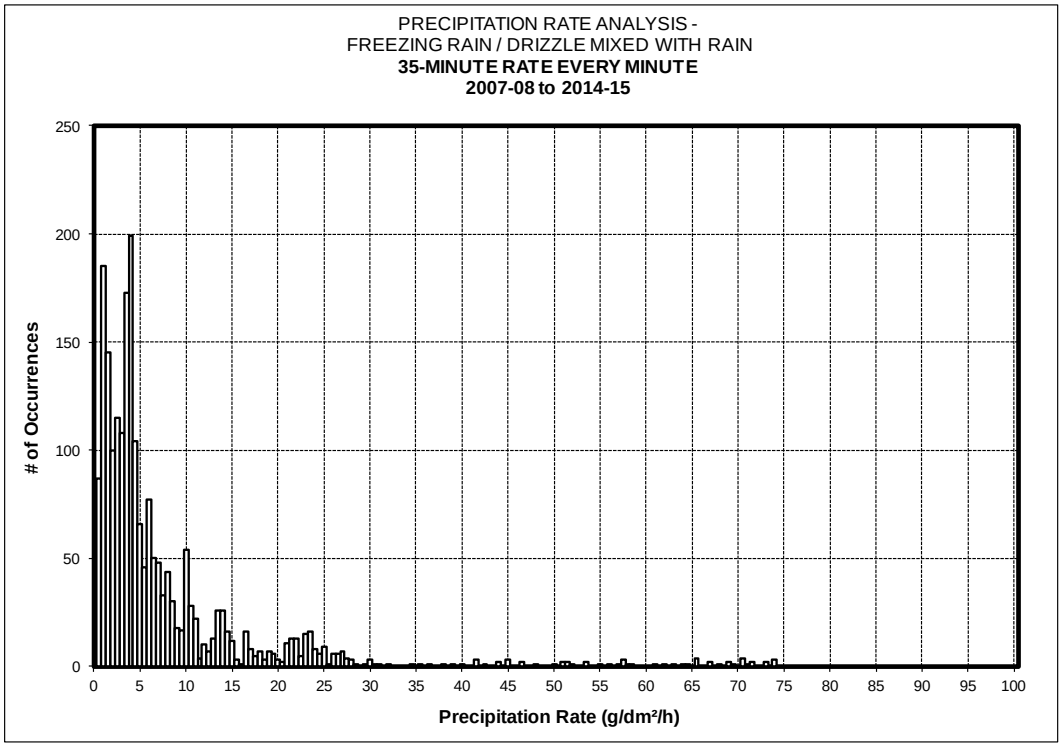
Precipitation Rate (g/dm²/h)

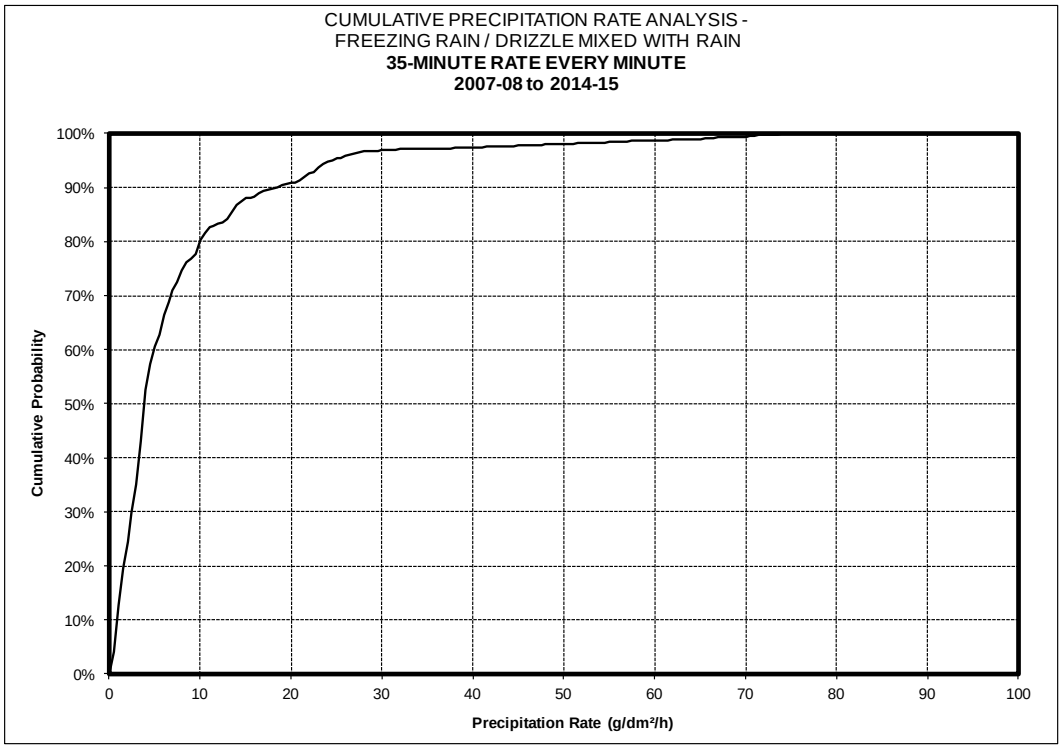

PRECIPITATION RATE ANALYSIS -
FREEZING RAIN / DRIZZLE MIXED WITH RAIN
6-MINUTE RATE EVERY MINUTE
2007-08 to 2014-15
# of Occurrences
0
50
100
150
200
250
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100
Precipitation Rate (g/dm²/h)


CUMULATIVE PRECIPITATION RATE ANALYSIS -
FREEZING RAIN / DRIZZLE MIXED WITH RAIN
6-MINUTE RATE EVERY MINUTE
2007-08 to 2014-15
Cumulative Probability
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
0 10 20 30 40 50 60 70 80 90 100
Precipitation Rate (g/dm²/h)

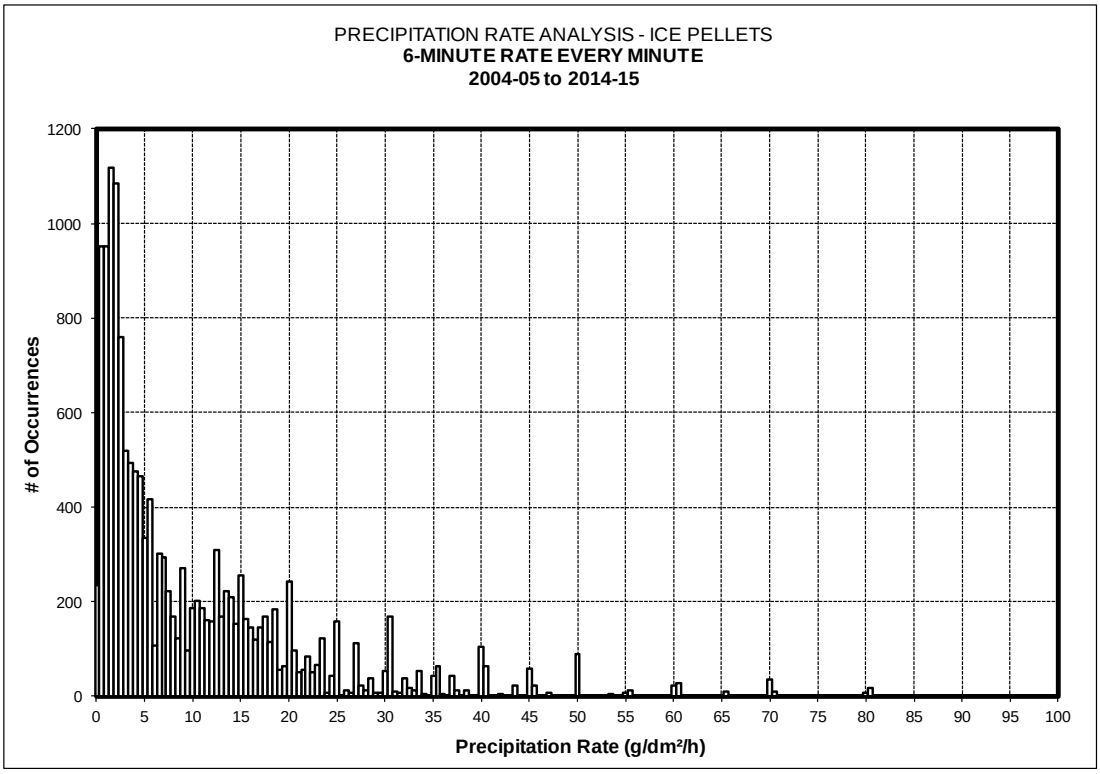

PRECIPITATION RATE ANALYSIS -
FREEZING RAIN / DRIZZLE MIXED WITH RAIN
20-MINUTE RATE EVERY MINUTE
2007-08 to 2014-15
# of Occurrences
0
50
100
150
200
250
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100
Precipitation Rate (g/dm²/h)

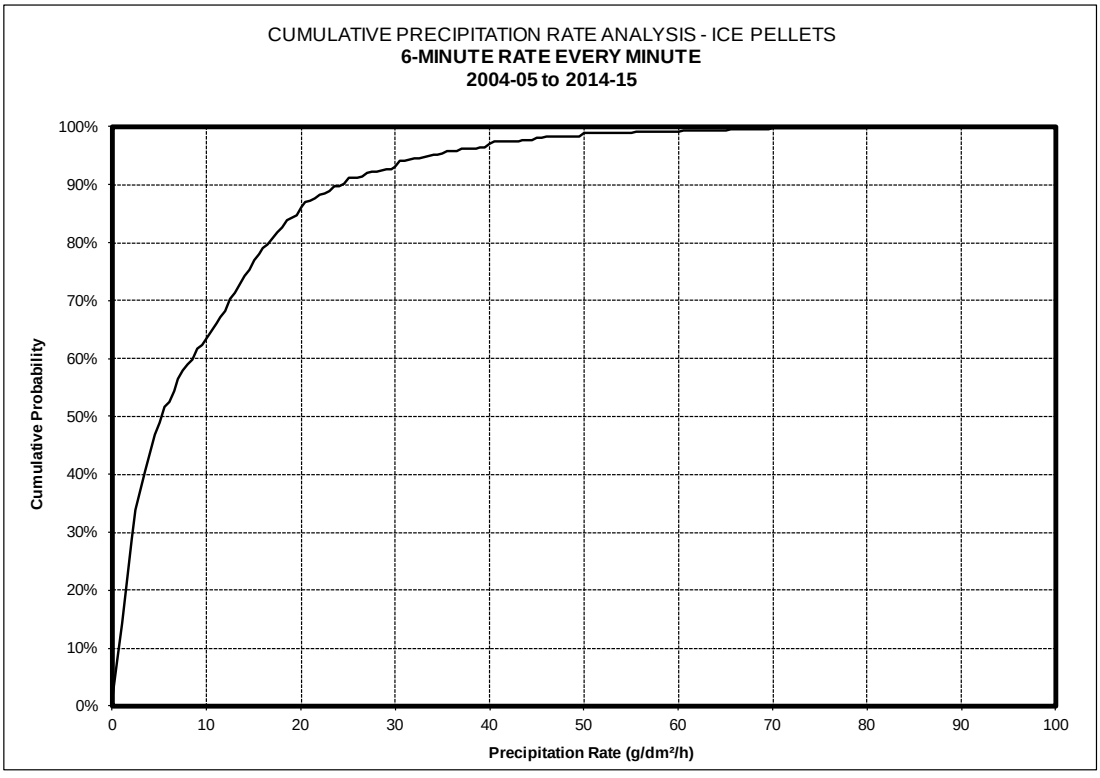

CUMULATIVE PRECIPITATION RATE ANALYSIS -
FREEZING RAIN / DRIZZLE MIXED WITH RAIN
20-MINUTE RATE EVERY MINUTE
2007-08 to 2014-15
Cumulative Probability
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
0 10 20 30 40 50 60 70 80 90 100
Precipitation Rate (g/dm²/h)

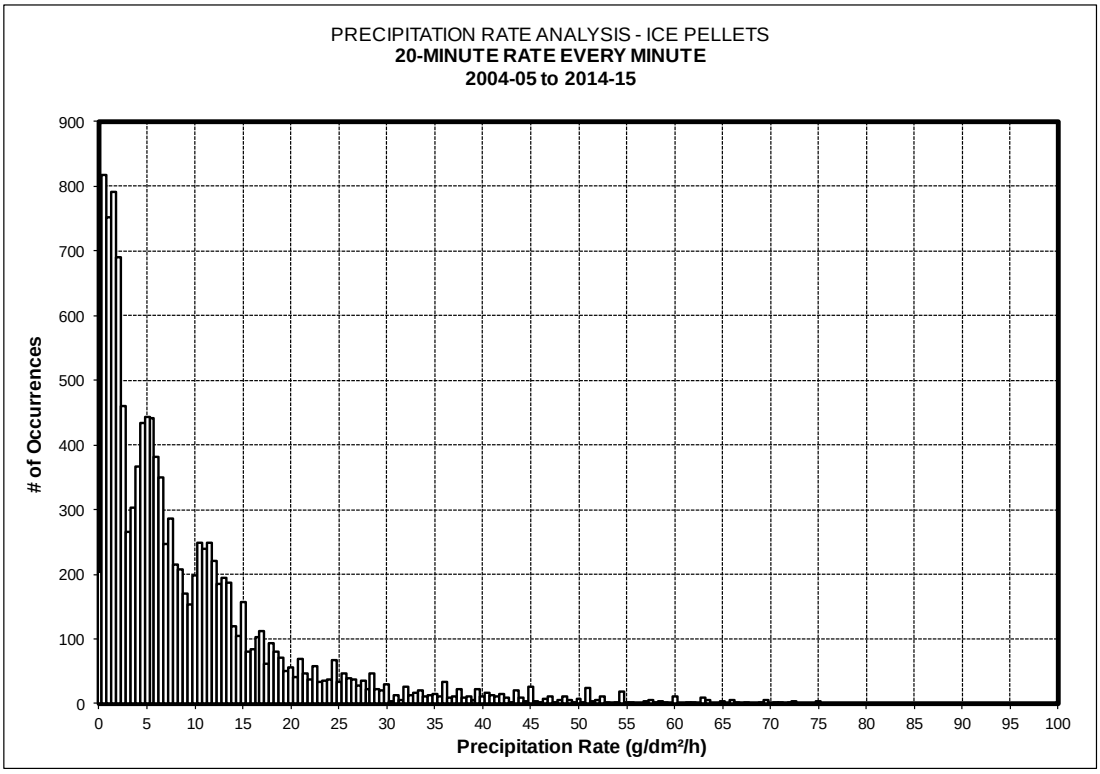

PRECIPITATION RATE ANALYSIS -
FREEZING RAIN / DRIZZLE MIXED WITH RAIN
35-MINUTE RATE EVERY MINUTE
2007-08 to 2014-15
# of Occurrences
0
50
100
150
200
250
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100
Precipitation Rate (g/dm²/h)

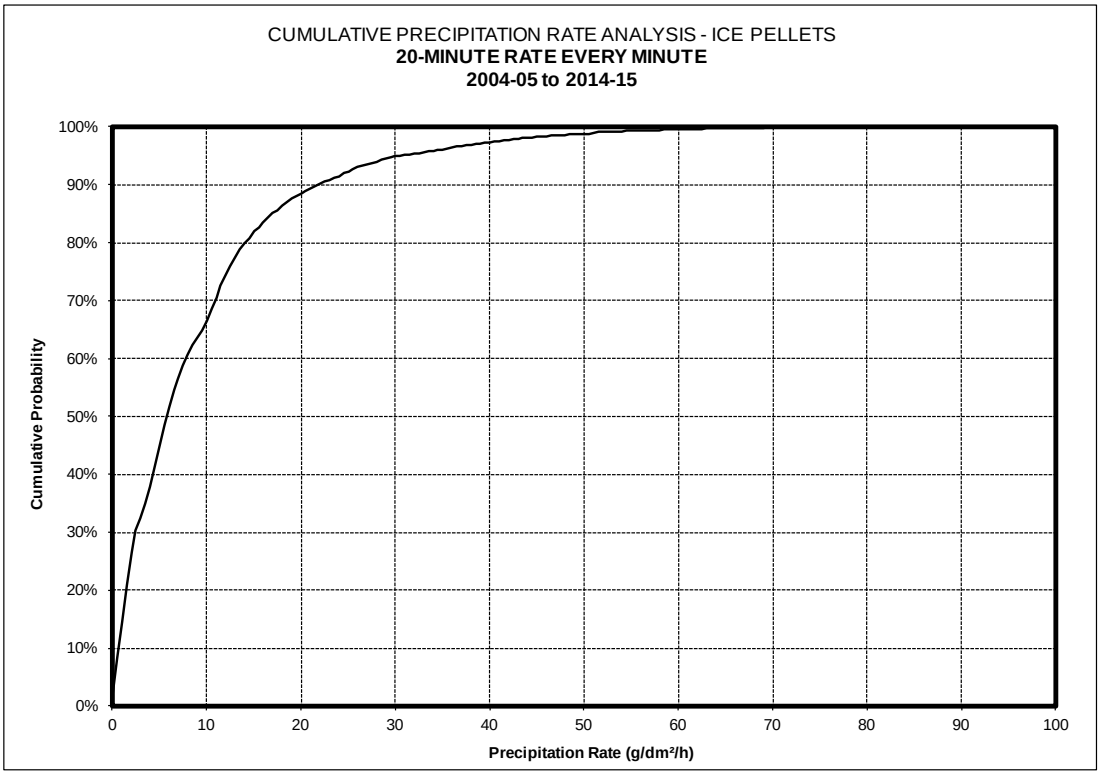

CUMULATIVE PRECIPITATION RATE ANALYSIS -
FREEZING RAIN / DRIZZLE MIXED WITH RAIN
35-MINUTE RATE EVERY MINUTE
2007-08 to 2014-15
Cumulative Probability
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
0 10 20 30 40 50 60 70 80 90 100
Precipitation Rate (g/dm²/h)

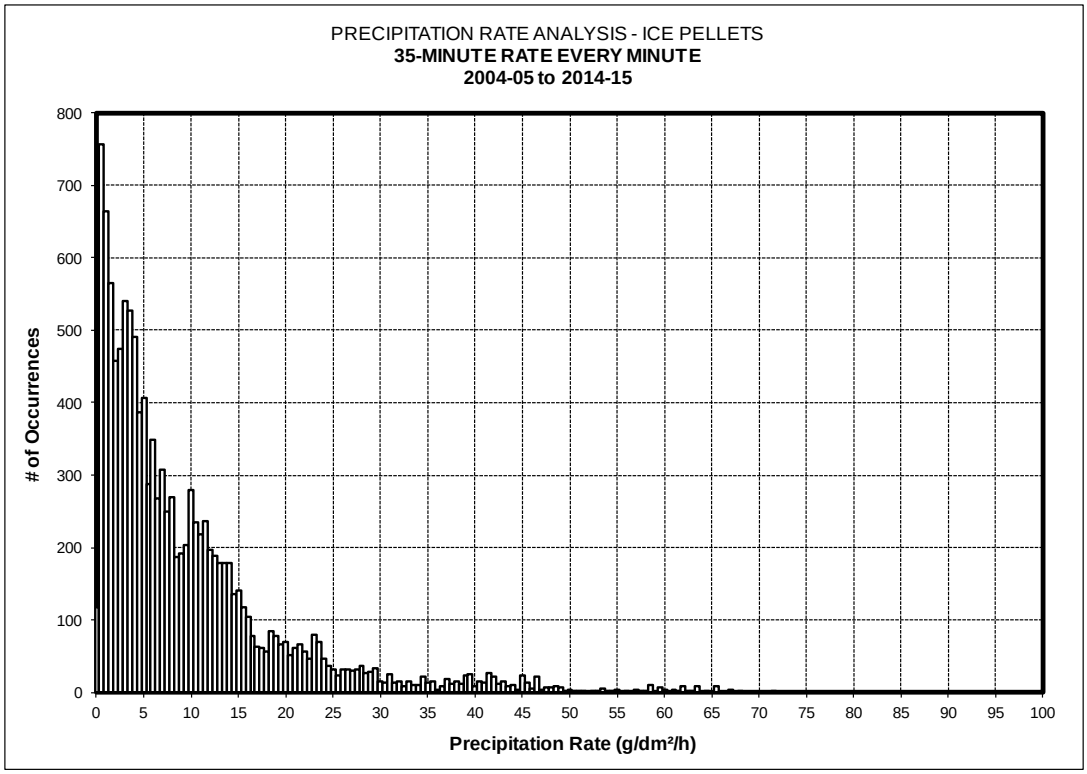
ICE PELLETS (2004-05 to 2014-15)

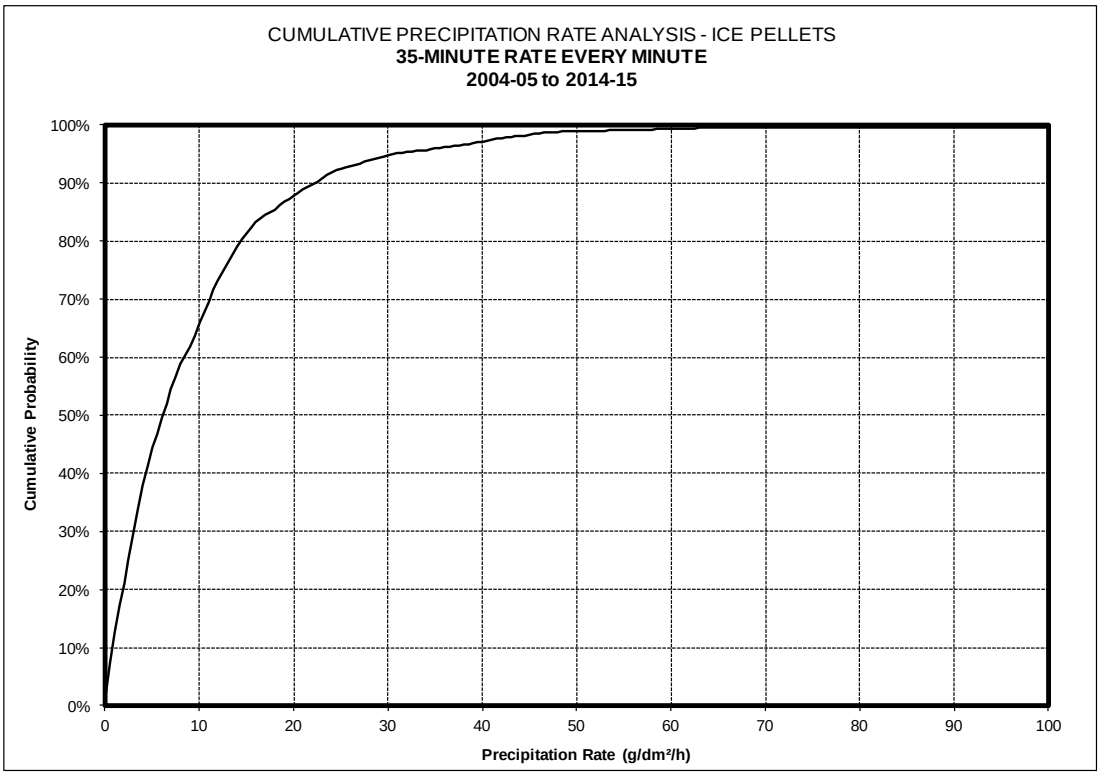

PRECIPITATION RATE ANALYSIS - ICE PELLETS
6-MINUTE RATE EVERY MINUTE
2004-05 to 2014-15
# of Occurrences
0
200
400
600
800
1000
1200
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100
Precipitation Rate (g/dm²/h)


CUMULATIVE PRECIPITATION RATE ANALYSIS - ICE PELLETS
6-MINUTE RATE EVERY MINUTE
2004-05 to 2014-15
Cumulative Probability
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
0 10 20 30 40 50 60 70 80 90 100
Precipitation Rate (g/dm²/h)


PRECIPITATION RATE ANALYSIS - ICE PELLETS
20-MINUTE RATE EVERY MINUTE
2004-05 to 2014-15
# of Occurrences
0
100
200
300
400
500
600
700
800
900
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100
Precipitation Rate (g/dm²/h)


CUMULATIVE PRECIPITATION RATE ANALYSIS - ICE PELLETS
20-MINUTE RATE EVERY MINUTE
2004-05 to 2014-15
Cumulative Probability
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
0 10 20 30 40 50 60 70 80 90 100
Precipitation Rate (g/dm²/h)


PRECIPITATION RATE ANALYSIS - ICE PELLETS
35-MINUTE RATE EVERY MINUTE
2004-05 to 2014-15
# of Occurrences
0
100
200
300
400
500
600
700
800
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100
Precipitation Rate (g/dm²/h)


CUMULATIVE PRECIPITATION RATE ANALYSIS - ICE PELLETS
35-MINUTE RATE EVERY MINUTE
2004-05 to 2014-15
Cumulative Probability
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
0 10 20 30 40 50 60 70 80 90 100
Precipitation Rate (g/dm²/h)

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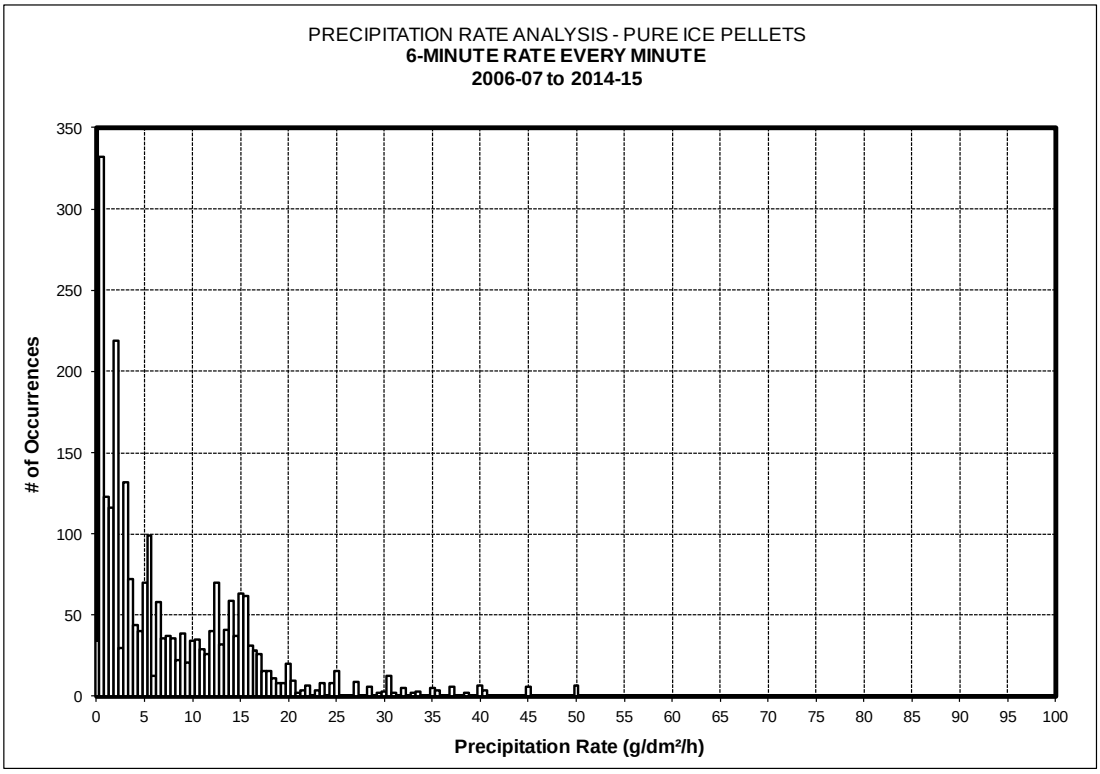
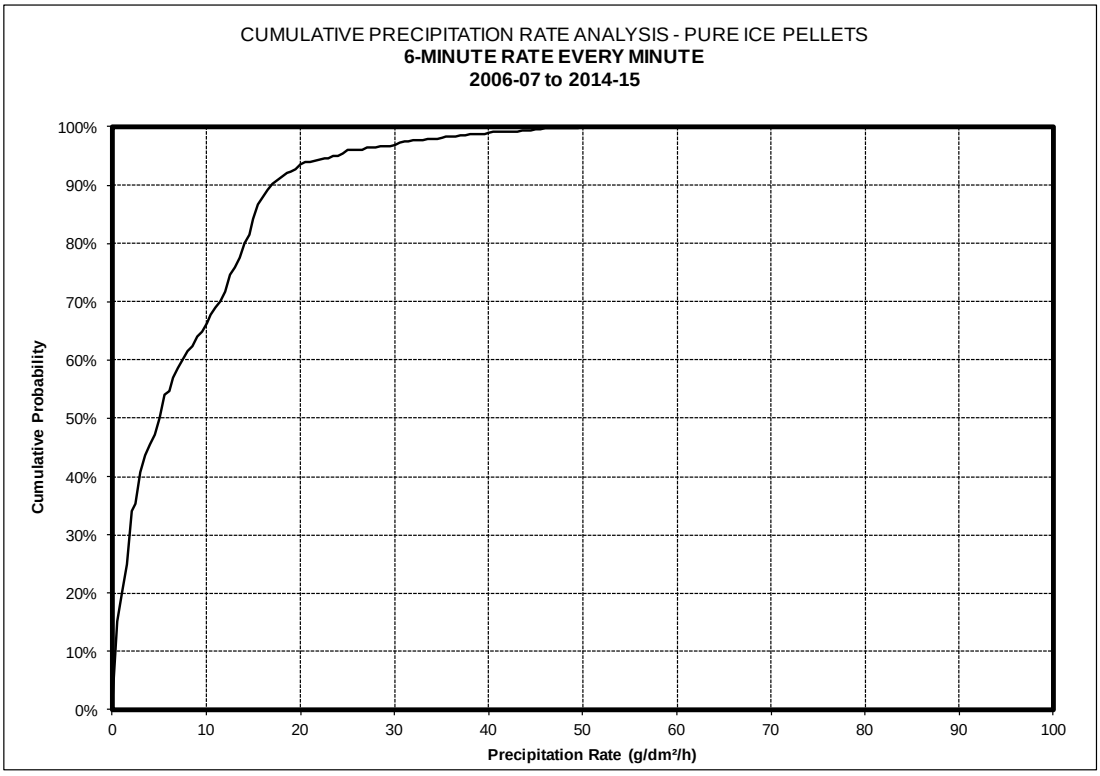
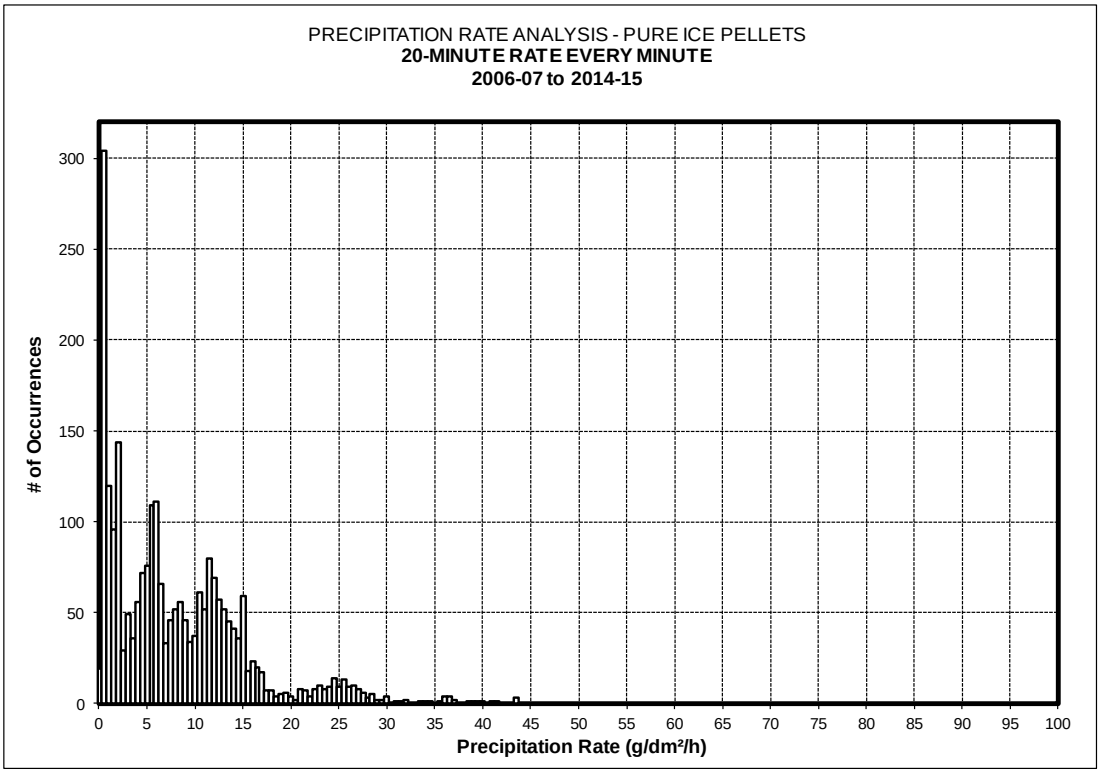
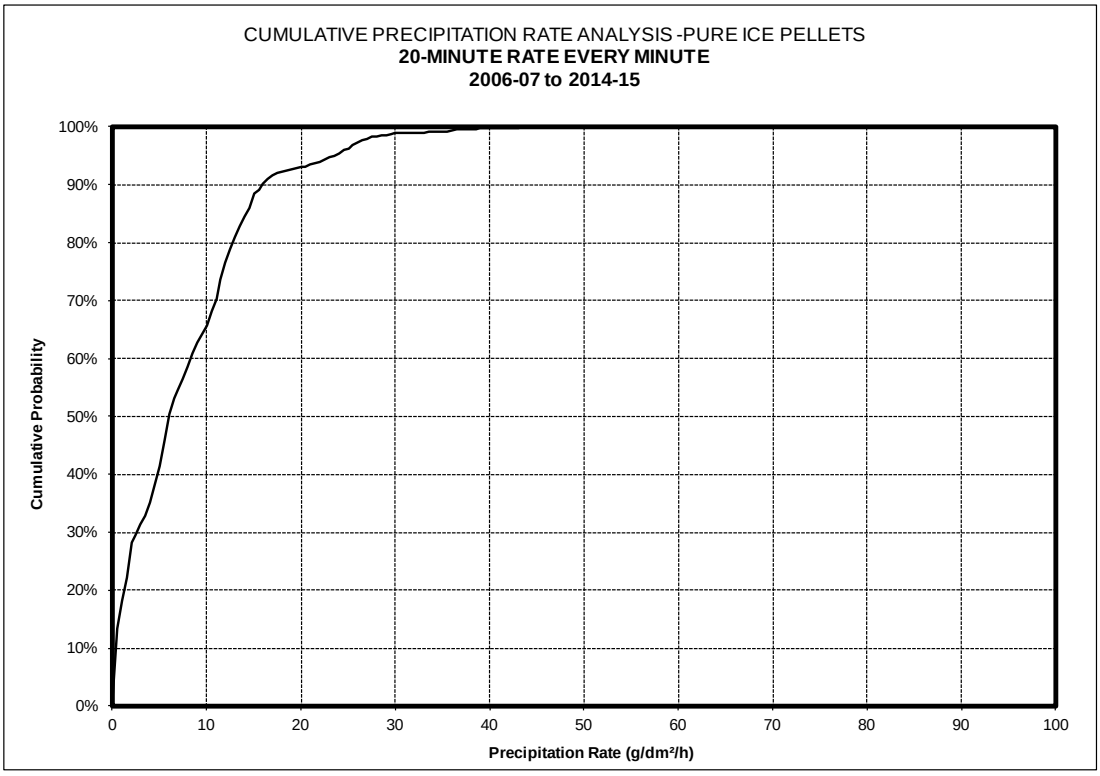
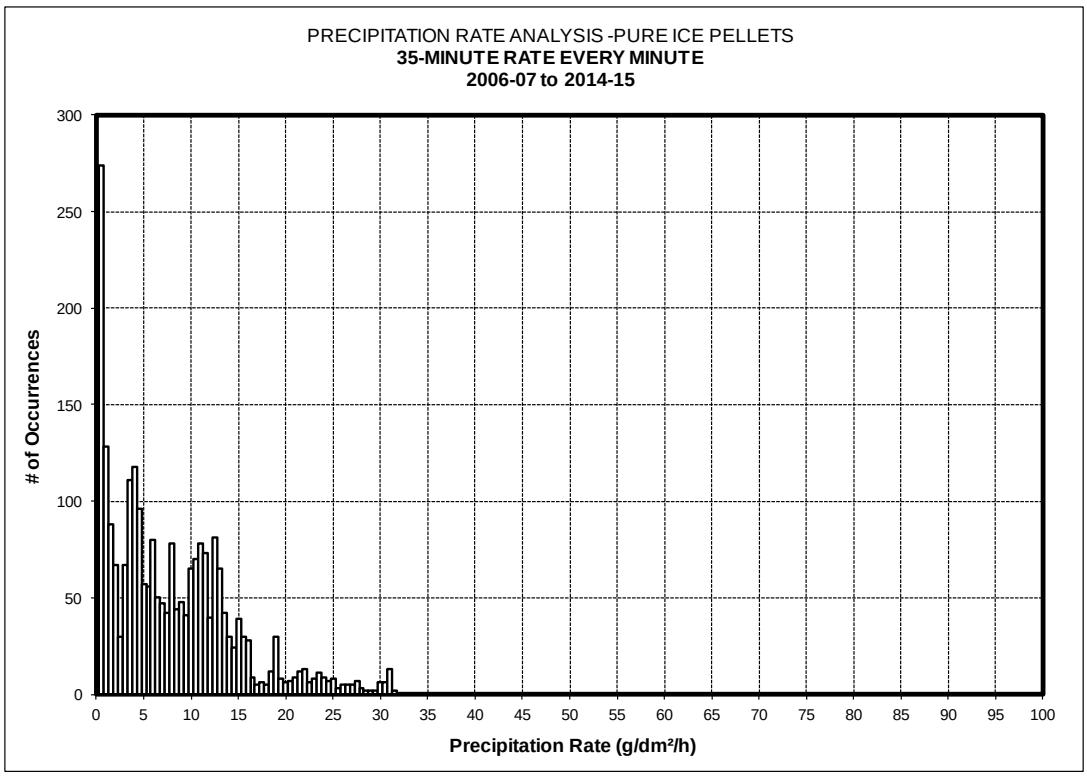
ICE PELLETS MIXED WITH OTHER PRECIPITATION

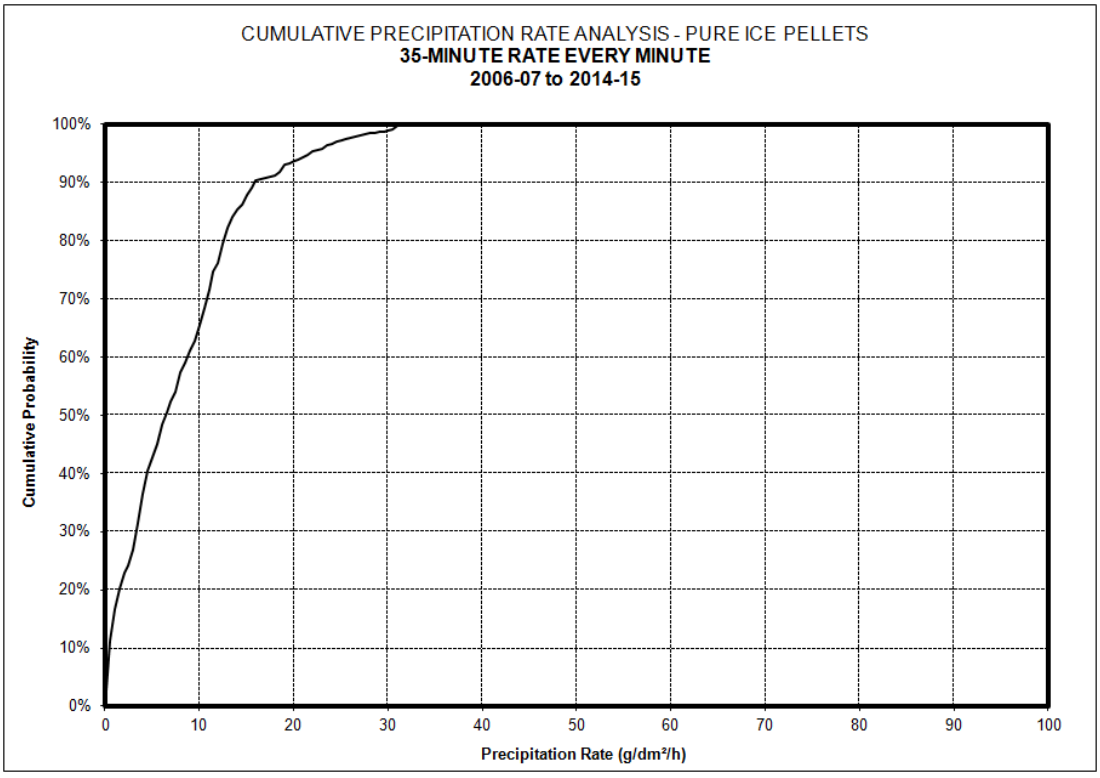

PRECIPITATION RATE ANALYSIS - PURE ICE PELLETS
6-MINUTE RATE EVERY MINUTE
2006-07 to 2014-15
# of Occurrences
0
50
100
150
200
250
300
350
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100
Precipitation Rate (g/dm²/h)

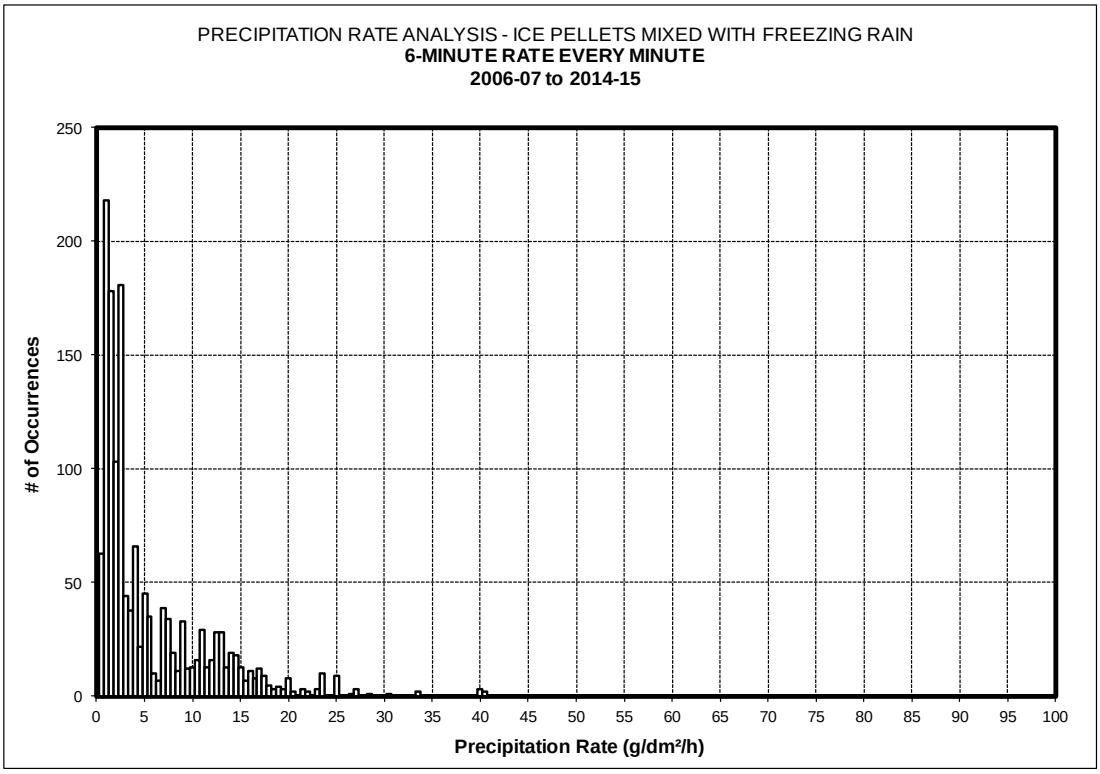

CUMULATIVE PRECIPITATION RATE ANALYSIS - PURE ICE PELLETS
6-MINUTE RATE EVERY MINUTE
2006-07 to 2014-15
Cumulative Probability
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
0 10 20 30 40 50 60 70 80 90 100
Precipitation Rate (g/dm²/h)

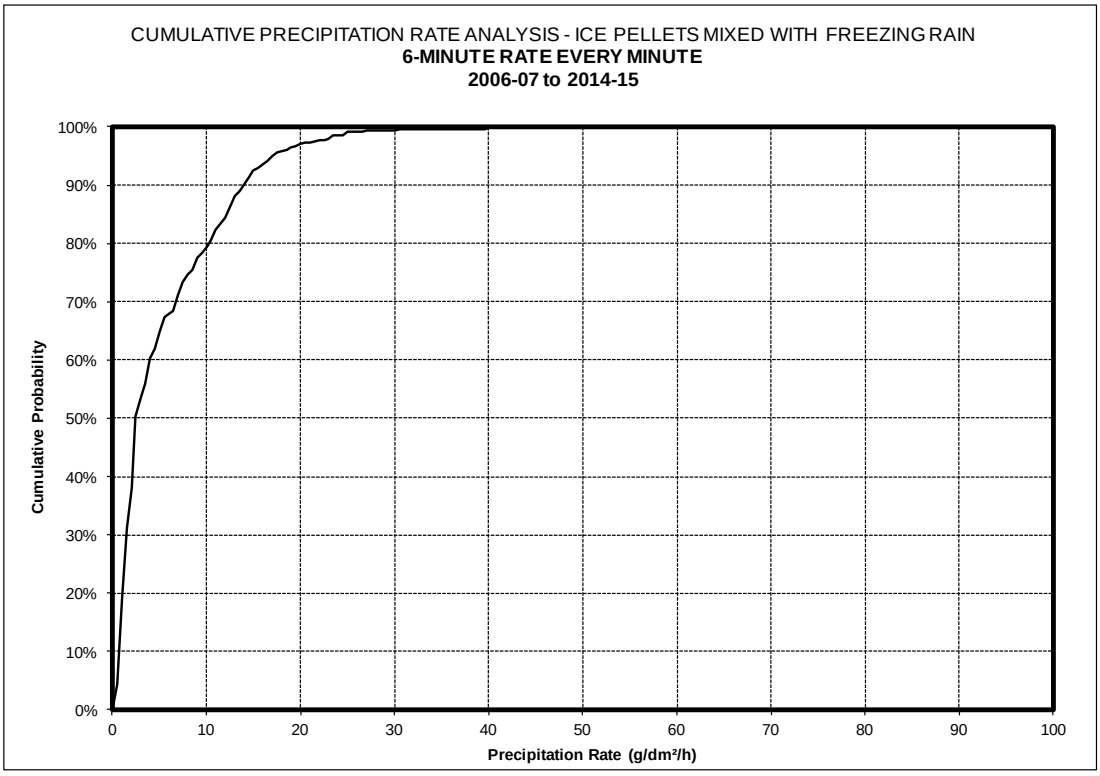

PRECIPITATION RATE ANALYSIS - PURE ICE PELLETS
20-MINUTE RATE EVERY MINUTE
2006-07 to 2014-15
# of Occurrences
0
50
100
150
200
250
300
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100
Precipitation Rate (g/dm²/h)

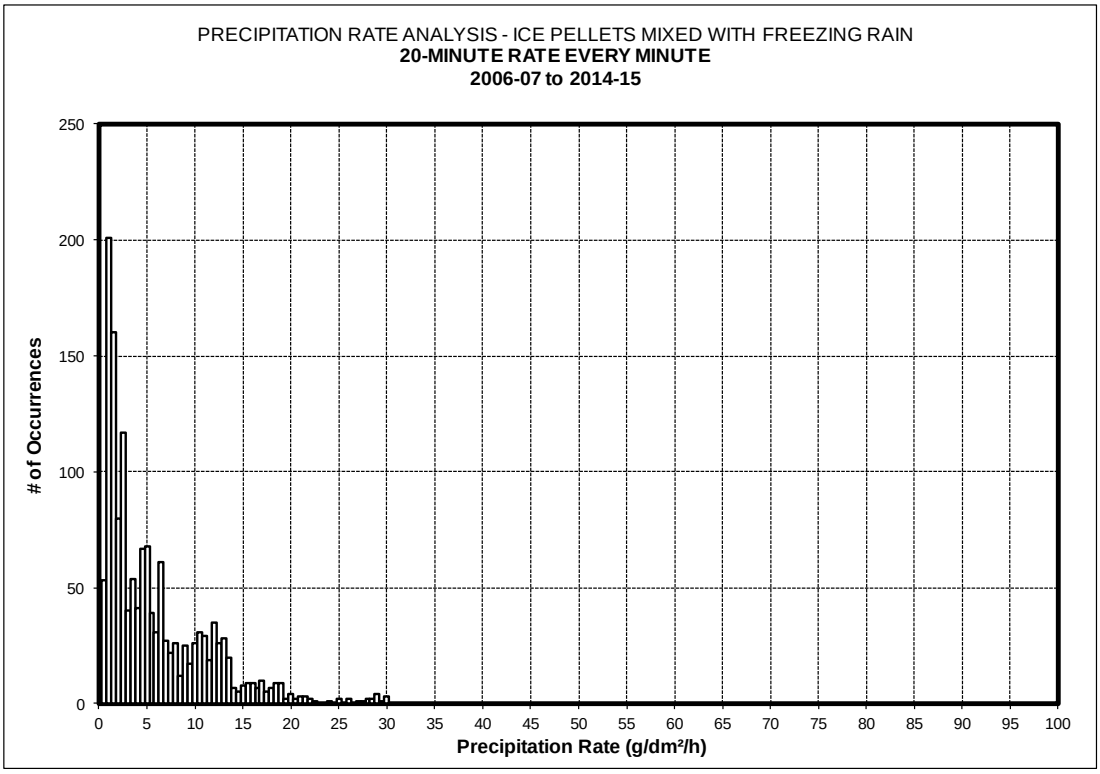

CUMULATIVE PRECIPITATION RATE ANALYSIS -PURE ICE PELLETS
20-MINUTE RATE EVERY MINUTE
2006-07 to 2014-15
Cumulative Probability
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
0 10 20 30 40 50 60 70 80 90 100
Precipitation Rate (g/dm²/h)

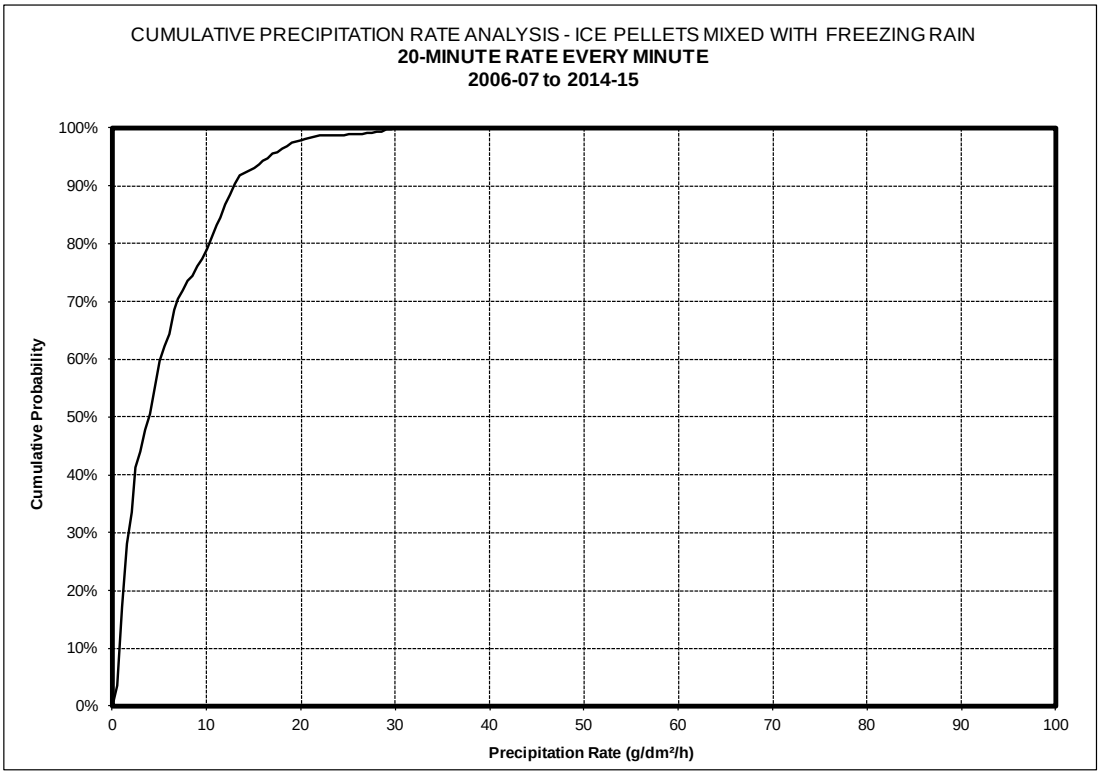

PRECIPITATION RATE ANALYSIS -PURE ICE PELLETS
35-MINUTE RATE EVERY MINUTE
2006-07 to 2014-15
# of Occurrences
0
50
100
150
200
250
300
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100
Precipitation Rate (g/dm²/h)


CUMULATIVE PRECIPITATION RATE ANALYSIS - PURE ICE PELLETS
35-MINUTE RATE EVERY MINUTE
2006-07 to 2014-15
Cumulative Probability
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
0 10 20 30 40 50 60 70 80 90 100
Precipitation Rate (g/dm²/h)


PRECIPITATION RATE ANALYSIS - ICE PELLETS MIXED WITH FREEZING RAIN
6-MINUTE RATE EVERY MINUTE
2006-07 to 2014-15
# of Occurrences
0
50
100
150
200
250
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100
Precipitation Rate (g/dm²/h)


CUMULATIVE PRECIPITATION RATE ANALYSIS - ICE PELLETS MIXED WITH FREEZING RAIN
6-MINUTE RATE EVERY MINUTE
2006-07 to 2014-15
Cumulative Probability
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
0 10 20 30 40 50 60 70 80 90 100
Precipitation Rate (g/dm²/h)


PRECIPITATION RATE ANALYSIS - ICE PELLETS MIXED WITH FREEZING RAIN
20-MINUTE RATE EVERY MINUTE
2006-07 to 2014-15
# of Occurrences
0
50
100
150
200
250
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100
Precipitation Rate (g/dm²/h)


CUMULATIVE PRECIPITATION RATE ANALYSIS - ICE PELLETS MIXED WITH FREEZING RAIN
20-MINUTE RATE EVERY MINUTE
2006-07 to 2014-15
Cumulative Probability
0%
10%
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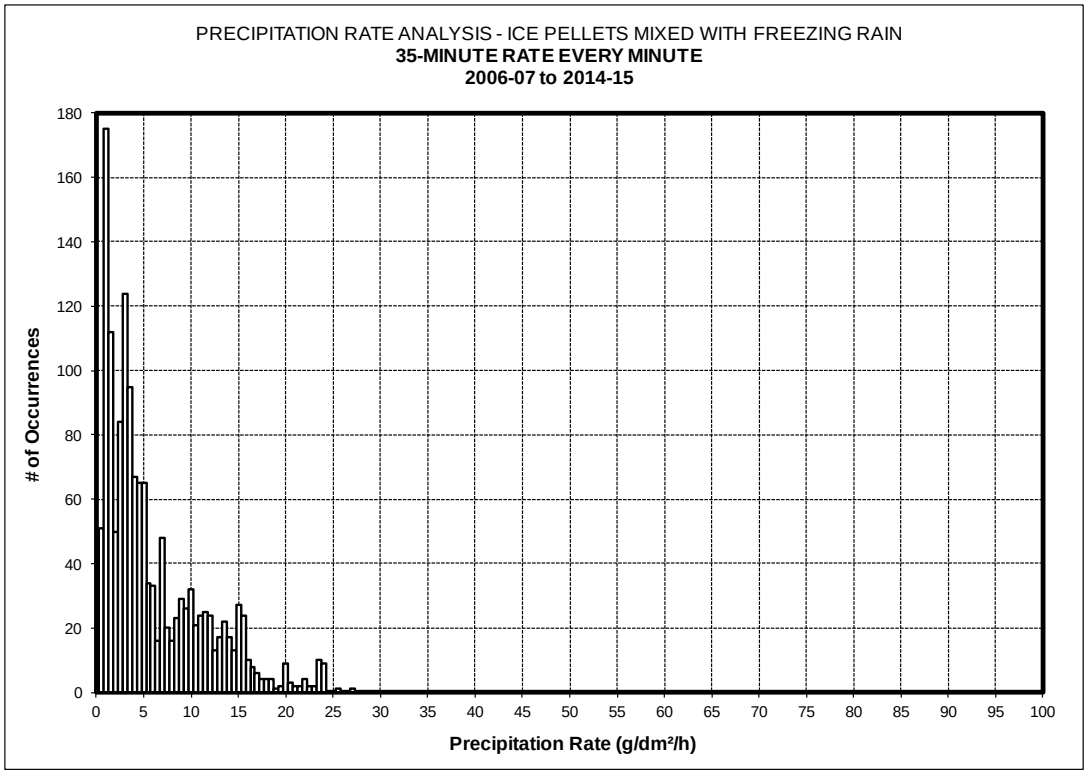
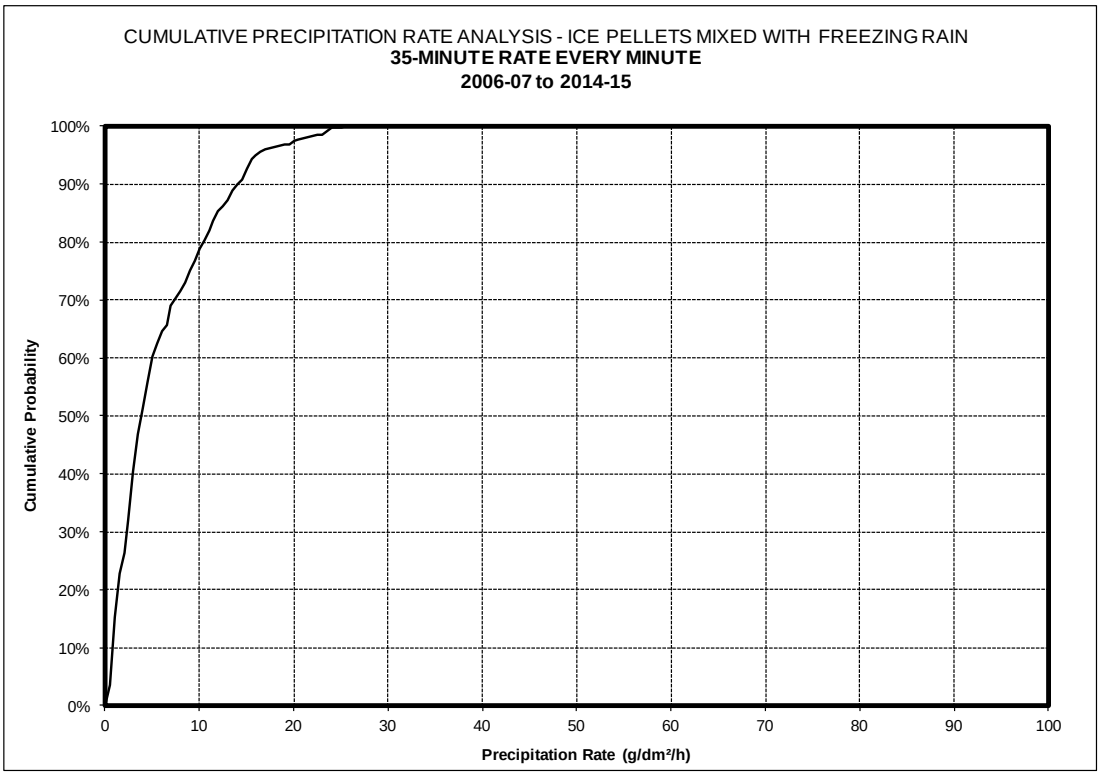
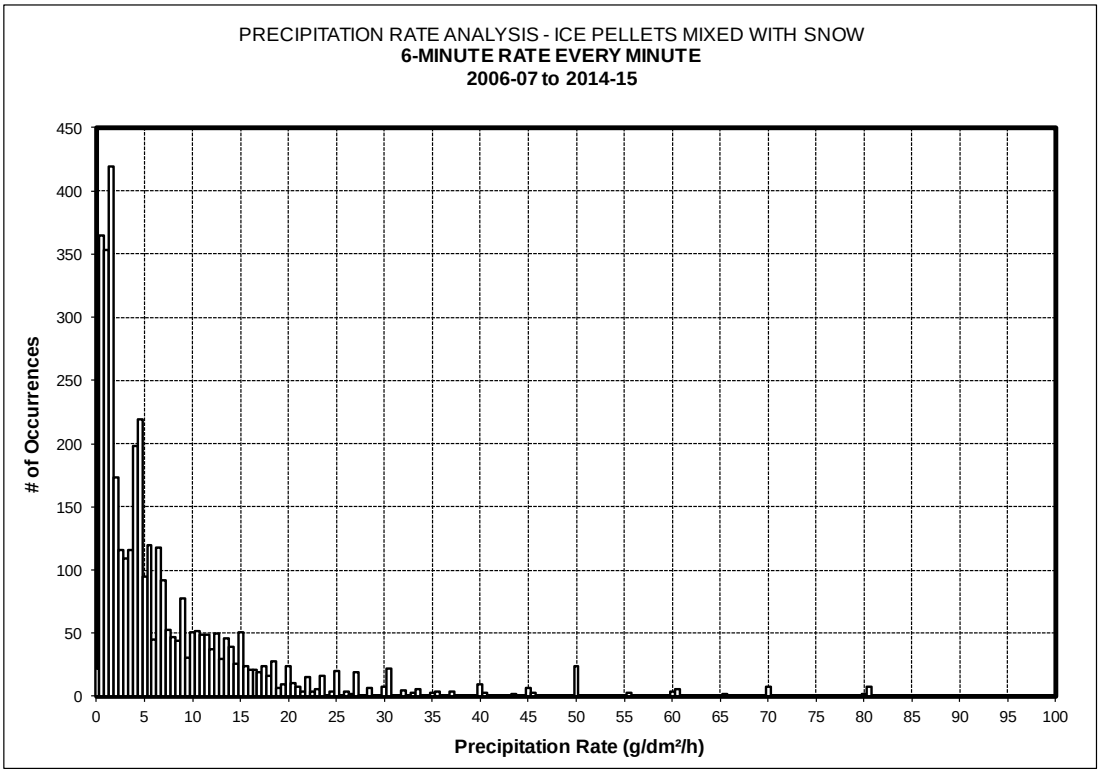
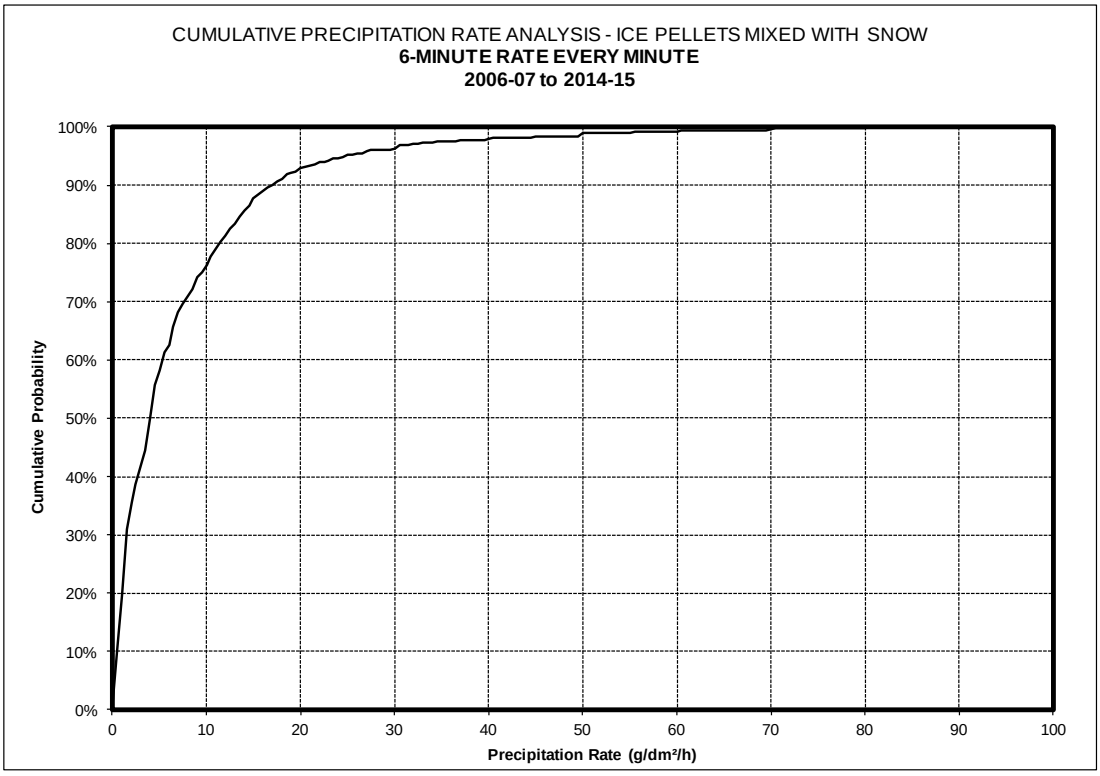
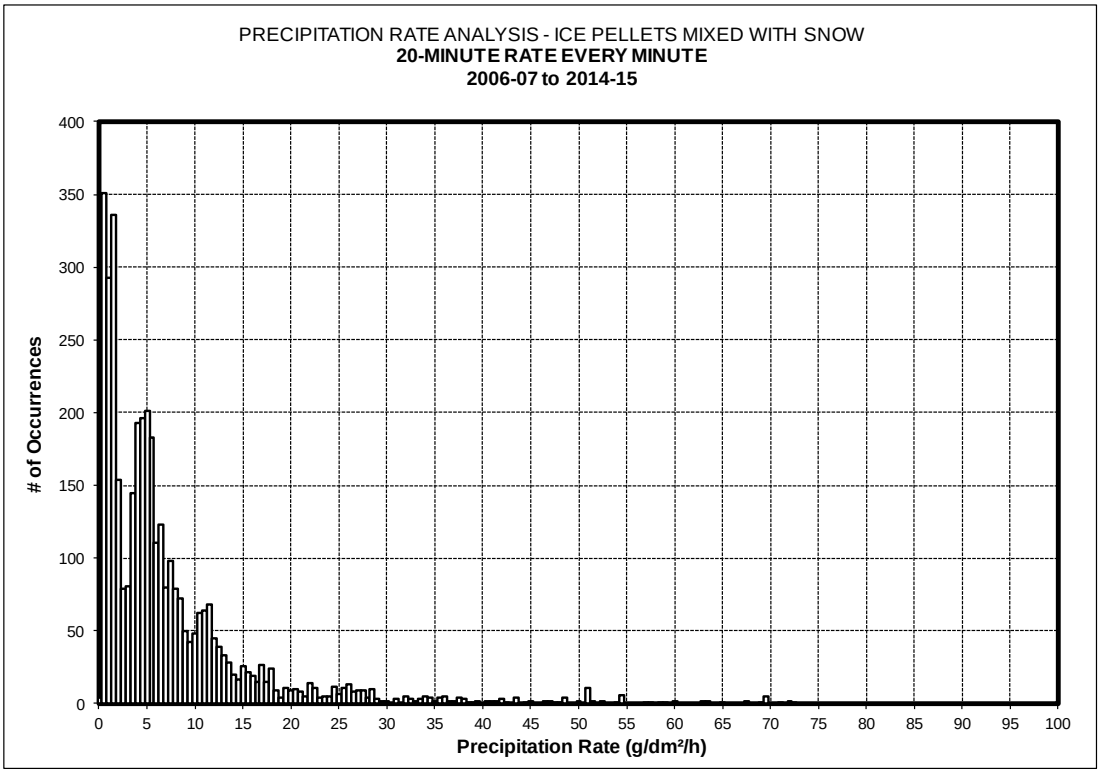
30%
40%
50%
60%
70%
80%
90%
100%
0 10 20 30 40 50 60 70 80 90 100
Precipitation Rate (g/dm²/h)

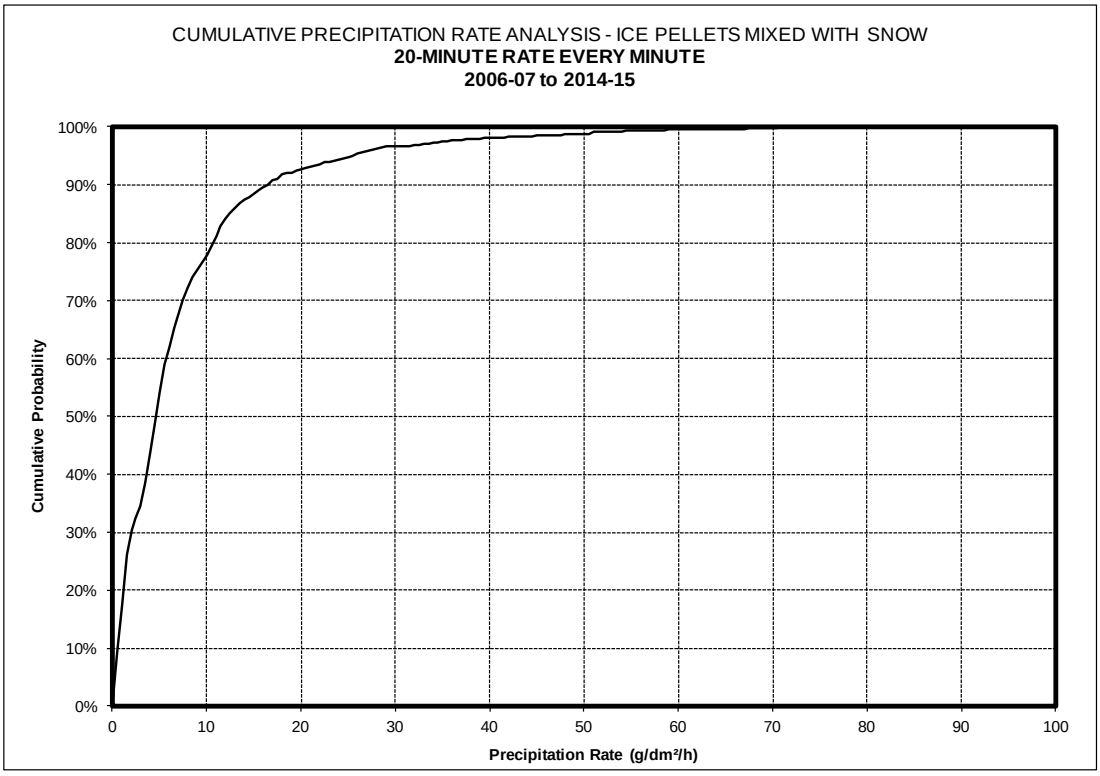

PRECIPITATION RATE ANALYSIS - ICE PELLETS MIXED WITH FREEZING RAIN
35-MINUTE RATE EVERY MINUTE
2006-07 to 2014-15
# of Occurrences
0
20
40
60
80
100
120
140
160
180
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100
Precipitation Rate (g/dm²/h)

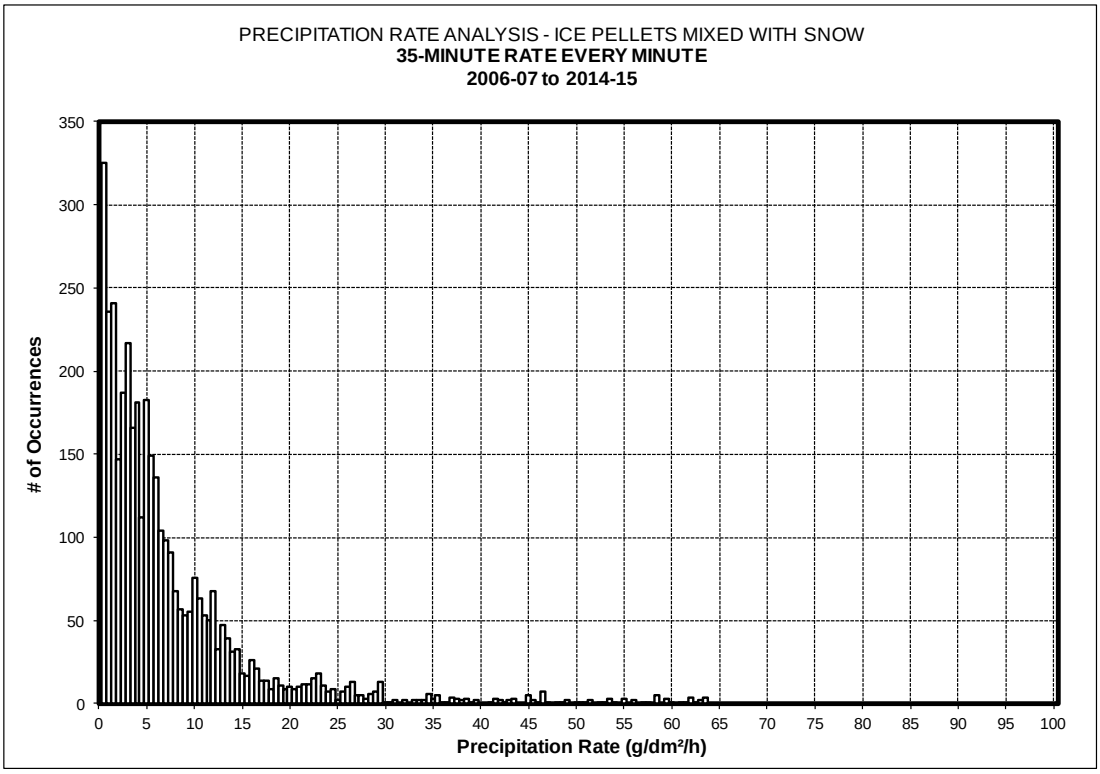

CUMULATIVE PRECIPITATION RATE ANALYSIS - ICE PELLETS MIXED WITH FREEZING RAIN
35-MINUTE RATE EVERY MINUTE
2006-07 to 2014-15
Cumulative Probability
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
0 10 20 30 40 50 60 70 80 90 100
Precipitation Rate (g/dm²/h)

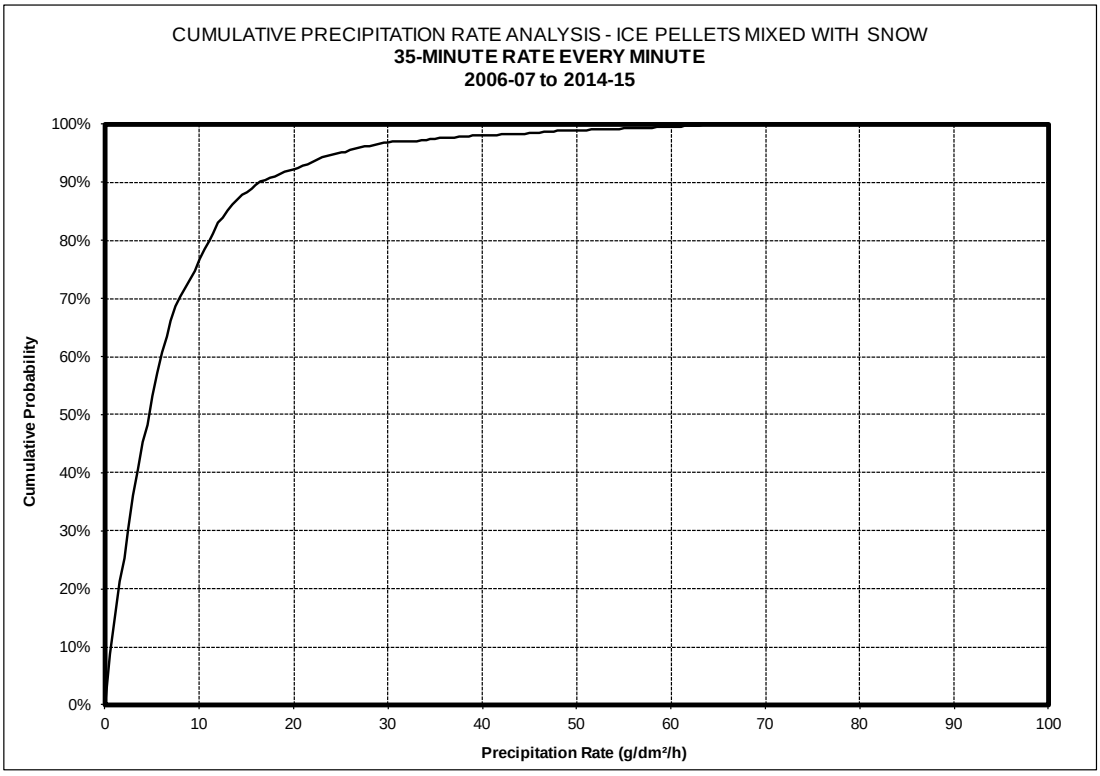

PRECIPITATION RATE ANALYSIS - ICE PELLETS MIXED WITH SNOW
6-MINUTE RATE EVERY MINUTE
2006-07 to 2014-15
# of Occurrences
0
50
100
150
200
250
300
350
400
450
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100
Precipitation Rate (g/dm²/h)

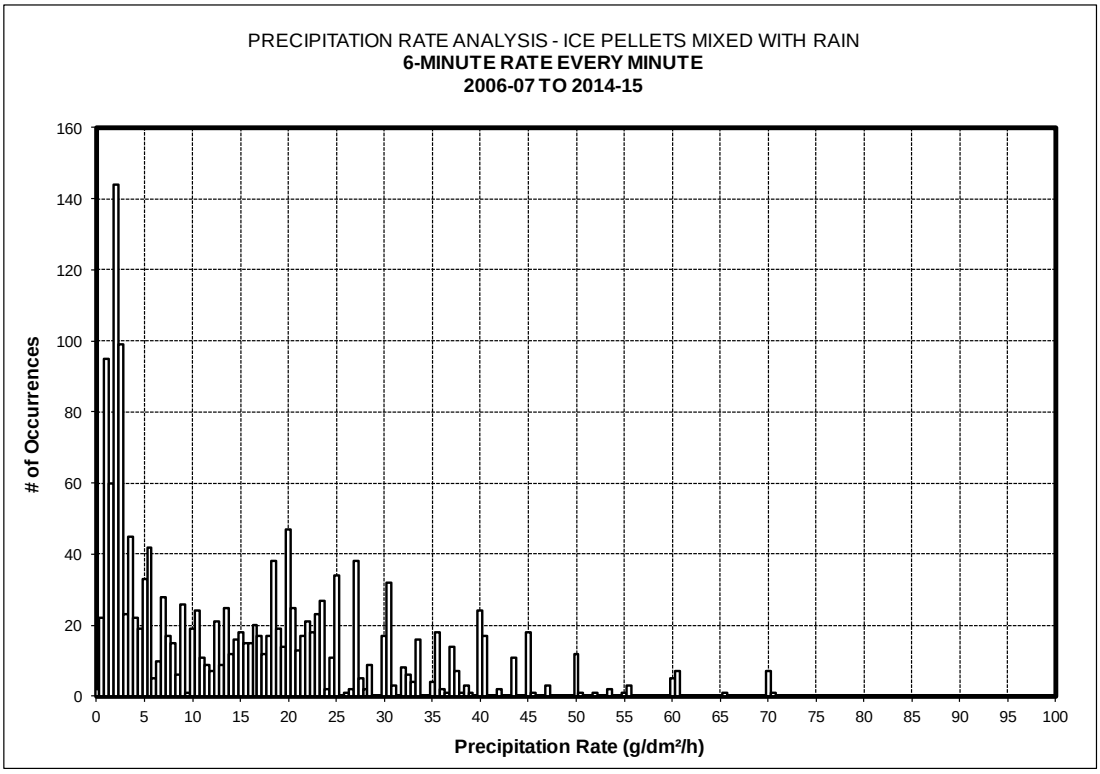

CUMULATIVE PRECIPITATION RATE ANALYSIS - ICE PELLETS MIXED WITH SNOW
6-MINUTE RATE EVERY MINUTE
2006-07 to 2014-15
Cumulative Probability
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
0 10 20 30 40 50 60 70 80 90 100
Precipitation Rate (g/dm²/h)

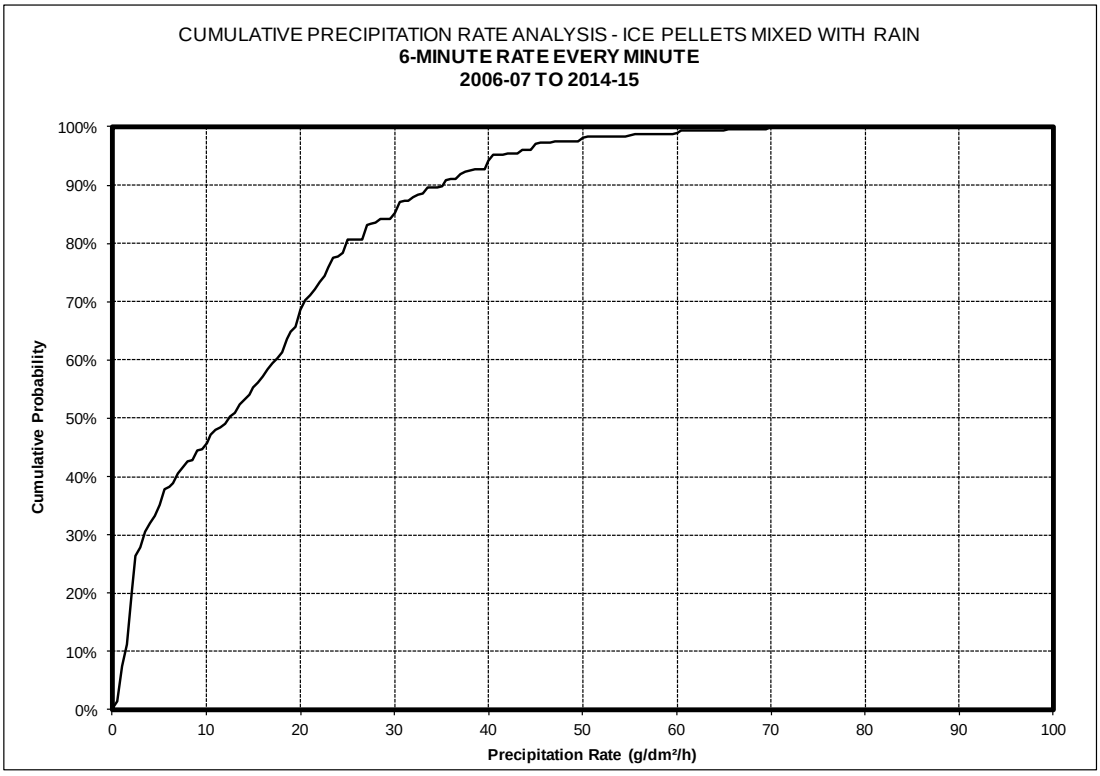

PRECIPITATION RATE ANALYSIS - ICE PELLETS MIXED WITH SNOW
20-MINUTE RATE EVERY MINUTE
2006-07 to 2014-15
# of Occurrences
0
50
100
150
200
250
300
350
400
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100
Precipitation Rate (g/dm²/h)

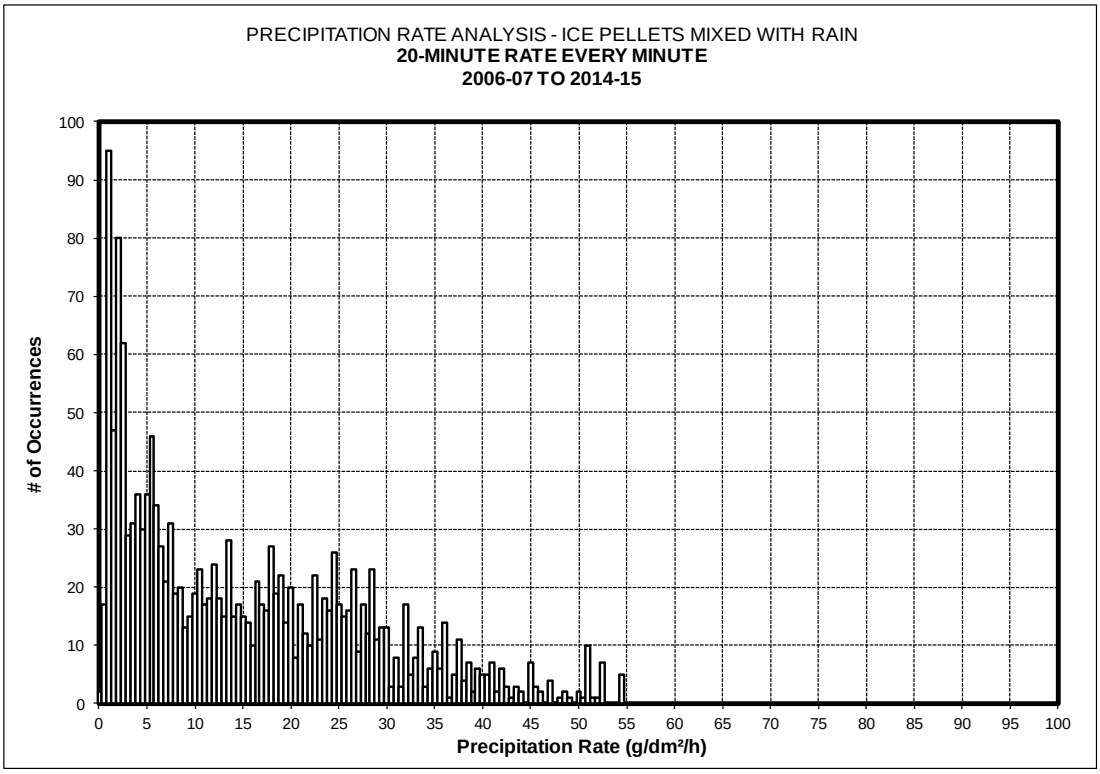

CUMULATIVE PRECIPITATION RATE ANALYSIS - ICE PELLETS MIXED WITH SNOW
20-MINUTE RATE EVERY MINUTE
2006-07 to 2014-15
Cumulative Probability
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
0 10 20 30 40 50 60 70 80 90 100
Precipitation Rate (g/dm²/h)

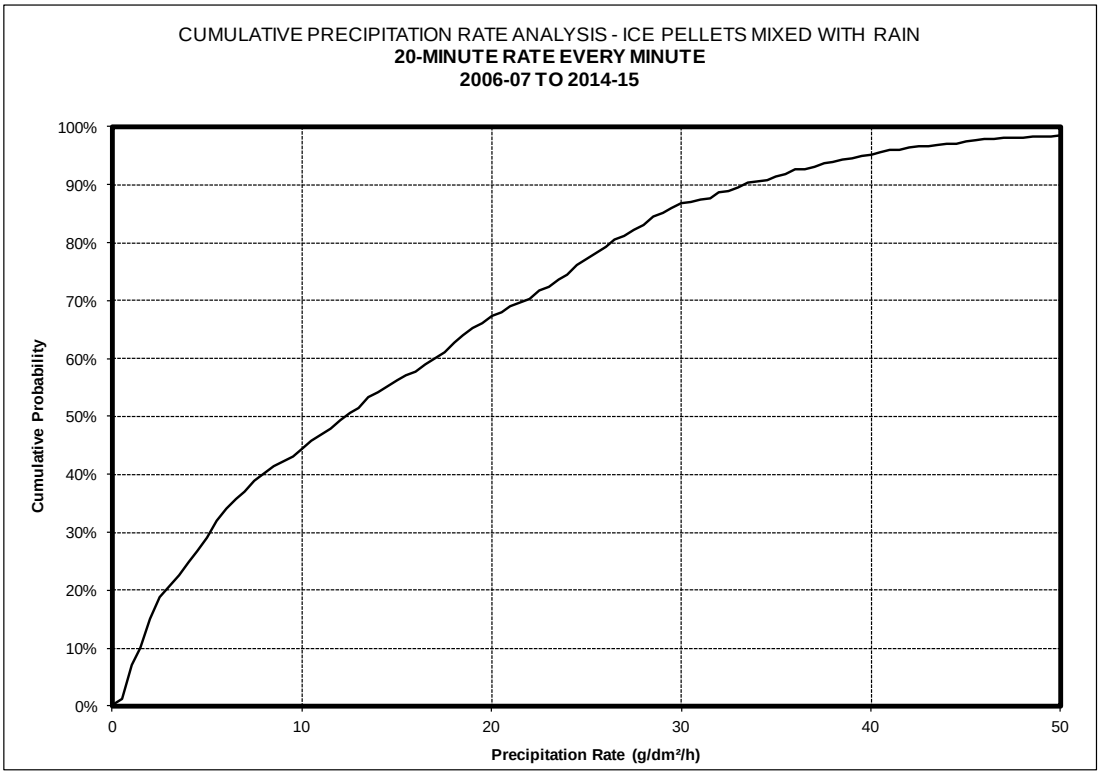

PRECIPITATION RATE ANALYSIS - ICE PELLETS MIXED WITH SNOW
35-MINUTE RATE EVERY MINUTE
2006-07 to 2014-15
# of Occurrences
0
50
100
150
200
250
300
350
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100
Precipitation Rate (g/dm²/h)

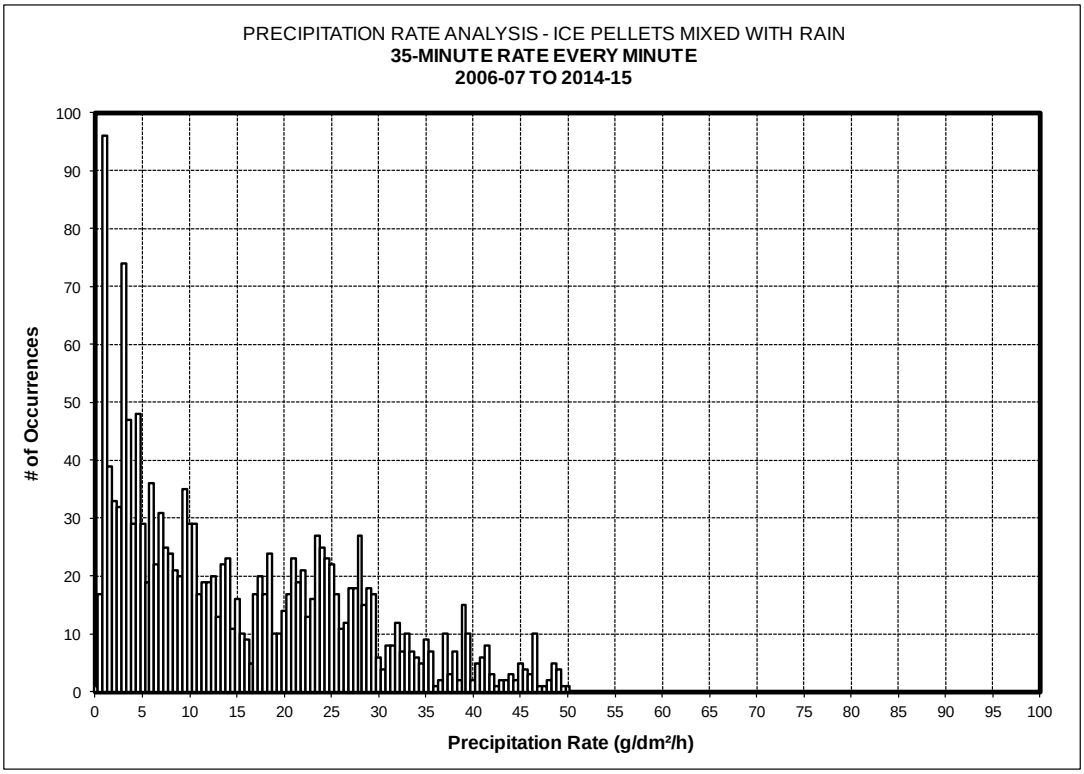

CUMULATIVE PRECIPITATION RATE ANALYSIS - ICE PELLETS MIXED WITH SNOW
35-MINUTE RATE EVERY MINUTE
2006-07 to 2014-15
Cumulative Probability
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
0 10 20 30 40 50 60 70 80 90 100
Precipitation Rate (g/dm²/h)

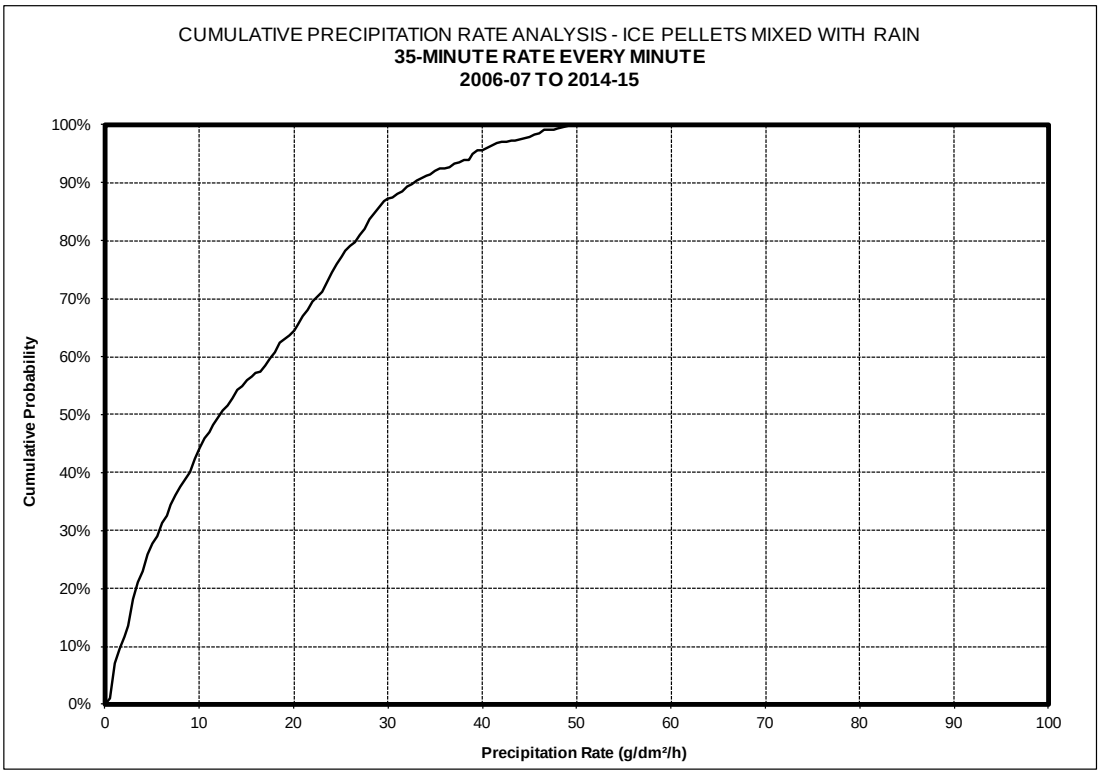

PRECIPITATION RATE ANALYSIS - ICE PELLETS MIXED WITH RAIN
6-MINUTE RATE EVERY MINUTE
2006-07 TO 2014-15
# of Occurrences
0
20
40
60
80
100
120
140
160
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100
Precipitation Rate (g/dm²/h)


CUMULATIVE PRECIPITATION RATE ANALYSIS - ICE PELLETS MIXED WITH RAIN
6-MINUTE RATE EVERY MINUTE
2006-07 TO 2014-15
Cumulative Probability
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
0 10 20 30 40 50 60 70 80 90 100
Precipitation Rate (g/dm²/h)


PRECIPITATION RATE ANALYSIS - ICE PELLETS MIXED WITH RAIN
20-MINUTE RATE EVERY MINUTE
2006-07 TO 2014-15
# of Occurrences
Precipitation Rate (g/dm²/h)
0
10
20
30
40
50
60
70
80
90
100
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
95
100


CUMULATIVE PRECIPITATION RATE ANALYSIS - ICE PELLETS MIXED WITH RAIN
20-MINUTE RATE EVERY MINUTE
2006-07 TO 2014-15
Cumulative Probability
Precipitation Rate (g/dm²/h)
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
0
10
20
30
40
50


PRECIPITATION RATE ANALYSIS - ICE PELLETS MIXED WITH RAIN
35-MINUTE RATE EVERY MINUTE
2006-07 TO 2014-15
# of Occurrences
Precipitation Rate (g/dm²/h)


CUMULATIVE PRECIPITATION RATE ANALYSIS - ICE PELLETS MIXED WITH RAIN
35-MINUTE RATE EVERY MINUTE
2006-07 TO 2014-15
Cumulative Probability
Precipitation Rate (g/dm²/h)

APPENDIX C

CR21X AUTOMATIC DATA ACQUISITION STATION

CR21X AUTOMATIC DATA ACQUISITION STATION

Source: Most of the info was researched and obtained from various web sites.

Observations of hourly precipitation amount are extremely useful tools for diagnostic and research purposes. In Canada, such observations are made at a number of sites, the most common being from Meteorological Service of Canada stations around the country.

The meteorological station at Dorval Airport (Photo 1) uses a Fisher/Porter (500 mm) precipitation gauge as a precipitation gauge and also a tipping bucket rain gauge.

Photo 1

The Fisher/Porter (F&P) precipitation gauge, developed by the Belfort instrument Company (Photo 2), is designed to work for many years in remote and harsh environments. The F&P gauge weighs the precipitation it collects in a large metal bucket. This bucket sits atop a mechanism that records the amount of precipitation (Photo 3). The recording & transmitting precipitation gauge converts the weight of collected precipitation into the equivalent depth of accumulated water in conventional units of inches or millimeters. An 8-inch (20.3cm) diameter, knife-edge orifice collects all forms of precipitation. Rain travels through a funnel into the galvanized weighing bucket. The funnel is removed during the winter season to collect snow. When sub-freezing temperatures are expected, the bucket is partially filled with an antifreeze compound, which allows snow and ice to melt

and be accurately measured. A weighing transducer provides instantaneous displacement values of the bucket in terms of millimeters of precipitation. This shaft displacement is transmitted every 5 seconds and averaged every minute in an attempt to eliminate spurious data caused by gusts of wind and temperature-induced contraction and expansion of the sensor. The readings are automatically logged with a CR21X data logger. The CR21X station has an accuracy of 0.1 mm (1 g/dm²).

Photo 2

Photo 3

Precipitation rates tend to fluctuate rapidly during snowstorms. The data from the CR21X station required less smoothing before it could be interpreted. The increased resolution of the CR21X weighing transducer allows better observation of short periods with heavy precipitation.

APPENDIX D

EXAMPLE OF MONTHLY METEOROLOGICAL SUMMARY MONTREAL - PIERRE ELLIOT TRUDEAU AIRPORT

ENVIRONNEMENT CANADA
SERVICE MÉTÉOROLOGIQUE DU CANADA

ENVIRONMENT CANADA
METEOROLOGICAL SERVICE OF CANADA

SOMMAIRE MÉTÉOROLOGIQUE MENSUEL
MONTHLY METEOROLOGICAL SUMMARY

Montreal/P E Trudeau Int'l A

FEVRIER 2005
FEBRUARY 2005

LAT : 45'28 N ALTITUDE : 35.7 MÈTRES (NMM) HEURE NORMALE UTILISÉE : DE L'EST
LONG : 73'45 W ÉLÉVATION : 35.7 MÈTRES (ASL) STANDARD TIME USED : EASTERN

DATE	TEMPÉRATURE TEMPERATURE			DEGRÉS-JOURS DEGREE-DAYS			HUMIDITÉ REL REL. HUMIDITY		ORAGE THUNDERSTORM	PRÉCIPITATIONS PRECIPITATION			NEIGE AU SOL SNOW ON GROUND	VENTS WINDS			INSOLATION EFFECTIVE BRIGHT SUNSHINE
	MAXIMALE MAXIMUM °C	MINIMALE MINIMUM °C	MOYENNE MEAN °C	DE CHAUFFE HEATING Base 18°C	DE CROISSANCE GROWING Base 5°C	DE RÉFRIGÉRATION COOLING Base 18°C	MAXIMALE MAXIMUM %	MINIMALE MINIMUM %		PLUIE (HAUTEUR) RAINFALL mm	NEIGE (HAUTEUR) SNOWFALL cm	PRÉCIP TOTAL TOTAL PRECIP mm	cm	VITESSE MOYENNE AVERAGE SPEED Km/h	DIRECTION DOMINANTE PREVAILING DIRECTION	VITESSE MOYENNE MAX SUR 2 MIN ET DIRECTION / MAX 2 MIN MEAN SPEED AND DIRECTION Km/h	HEURES HOURS
1	-3.4	-16.8	-10.1	28.1			91	51					6	5.8	SW	SW* 11	5.4
2	-0.7	-8.5	-4.6	22.6			85	61					6	5.9	NNE	NNE* 11	4.1
3	-1.1	-10.5	-5.8	23.8			89	66					6	8.3	N	NNE* 13	2.2
4	3.3	-10.8	-3.8	21.8			85	47					6	5.1	SW	SW* 11	9.0
5	1.3	-7.4	-3.1	21.1			93	66					4	5.5	SSW	SW* 11	8.1
6	4.6	-8.0	-1.7	19.7			93	63					3	7.7	NNE	ENE* 13	5.2
7	6.4	-3.3	1.6	16.4			86	50					2	3.3	NNE*	NNE 11	
8	4.2	1.4	2.8	15.2			97	64		2.2		2.2	1	7.1	SSE	W* 15	
9	2.0	-4.2	-1.1	19.1			96	61			1.0	1.0	TR	14.5	W	NE 31	
10	-4.2	-9.1	-6.7	24.7			92	46			9.8	9.8	2	30.9	NNE	NNE 46	
11	0.1	-12.1	-6.0	24.0			66	39					6	19.1	W	WNW 33	9.6
12	0.3	-7.7	-3.7	21.7			89	63			0.2	0.2	6	17.4	W	W* 31	2.9
13	-3.7	-12.9	-8.3	26.3			83	53			1.0	1.0	6	12.2	SW	SW 24	9.8
14	2.1	-13.0	-5.5	23.5			88	54		0.2	1.0	1.2	6	22.9	E	SE 43	0.6
15	4.0	1.7	2.9	15.1			95	76		0.6	TR	0.6	4	19.9	SW	SW 41	
16	3.4	-7.9	-2.3	20.3			99	75		3.6	9.4	13.0	TR	11.5	N*	NW* 19	
17	-1.8	-11.3	-6.6	24.6			88	52			TR	TR	6	6.8	W*	NW 15	9.5
18	-6.2	-16.8	-11.5	29.5			92	60			4.2	4.2	9	18.7	WSW	WSW 35	1.2
19	-5.0	-19.4	-12.2	30.2			93	47			0.4	0.4	8	16.1	SW	SW 26	6.0
20	-12.1	-19.6	-15.9	33.9			57	37					7	11.2	W*	NNW 19	10.0
21	-4.9	-14.6	-9.8	27.8			90	50			9.6	9.6	7	20.6	NE	NE* 30	
22	-2.1	-8.7	-5.4	23.4			91	71			0.4	0.4	9	8.0	SW	WNW 13	2.4
23	-5.8	-15.0	-10.4	28.4			84	56					9	13.5	W	WSW* 24	9.9
24	-8.3	-20.8	-14.6	32.6			88	45					9	8.6	NE	NE 17	7.2
25	-5.2	-15.7	-10.5	28.5			83	36					9	10.2	NNE	NNE 20	9.9
26	-2.0	-18.7	-10.4	28.4			80	39					9	6.2	W	SW* 15	8.7
27	-5.2	-14.8	-10.0	28.0			65	39					9	18.3	W	W 33	10.3
28	-5.3	-14.7	-10.0	28.0			67	44					9	19.8	NE	NE* 31	0.4
	MOY -1.6 MEAN	MOY -11.4 MEAN	MOY -6.5 MEAN	TOTAL 686.7	TOTAL	TOTAL	MOY 86 MEAN	MOY 54 MEAN	TOTAL	TOTAL 6.6	TOTAL 37.0	TOTAL 43.6		MOY 12.7 MEAN	DOMINANTE W PREVAILING	MAXIMALE NNE 46 MAXIMUM	TOTAL 132.4
NORMALE NORMAL	-4.3	-13.4	-8.9	758.2	0.9	0.0			0	18.4	43.8	59.7		15.0	WSW		123.9

SOMMAIRE DE DEGRÉS-JOURS
DEGREE-DAY SUMMARY

AU-DESSOUS DE 18 °C BELOW 18°C	ANNÉE EN COURS THIS YEAR	NORMALE NORMAL	AU-DESSUS DE 5°C ABOVE 5°C	ANNÉE EN COURS THIS YEAR	NORMALE NORMAL
TOTAL DU MOIS / TOTAL FOR MONTH	686.7	758.2	TOTAL DU MOIS / TOTAL FOR MONTH		0.9
ACCUMULÉS DEPUIS LE 1er JUILLET / ACCUMULATED SINCE JULY 1st	3207.0	3370.2	ACCUMULÉS DEPUIS LE 1er AVRIL / ACCUMULATED SINCE APRIL 1st	2141.5	2066.9

JOURS AVEC PRÉCIPITATIONS TOTALES DAYS WITH TOTAL PRECIPITATION — mm

0,5 ou plus or more	1,0 ou plus or more	2,0 ou plus or more	10,0 ou plus or more	50,0 ou plus or more
9	8	5	1	

JOURS AVEC CHÛTES DE NEIGE DAYS WITH SNOWFALL — cm

0,2 ou plus or more	1,0 ou plus or more	2,0 ou plus or more	10,0 ou plus or more	50,0 ou plus or more
10	7	4		

Canada

1. Normale/Normal 1971-2000
2. Journée climatologique/Climatological Day (01h00HNE à/to 01h00HNE)
3. (AUTO) : mesures d'une station automatique/data from automatic station
4. TR = Trace M = Manquant/Missing E = Estimé/Estimated C = Calme/Calm
5. Pas de valeur/No entry = Pas d'événement/No occurence
6. * = indique la première de plusieurs valeurs valides/indicates first of many valid values
7. c = correction

Données horaires non contrôlées
Hourly data not validated
Les précipitations ont un seuil mesurable de 1,0 mm
Measurable threshold of precipitation is 1,0 mm

Création : 4 MARS 2005
Created : MARCH 4 2005

RELEVÉS COMPARATIFS À : COMPARATIVE RECORDS AT :	Montreal/P E Trudeau Int'l A					FEVRIER 2005 FEBRUARY 2005						
	UNITÉS UNITS	CE MOIS-CI THIS MONTH		ANNÉE PRÉCÉDENTE PREVIOUS YEAR		NORMALE NORMAL	RECORD POUR LE MOIS RECORD FOR THE MONTH					
							MAXIMUM ABSOLU HIGHEST EVER			MINIMUM ABSOLU LOWEST EVER			DEPUIS SINCE
		RELEVÉ VALUE	JOUR DAY	RELEVÉ VALUE	JOUR DAY		RELEVÉ VALUE	JOUR DAY	ANNÉE YEAR	RELEVÉ VALUE	JOUR DAY	ANNÉE YEAR	
TEMPÉRATURE MAXIMALE HIGHEST TEMPERATURE (MAXIMUM)	°CELSIUS	6.4	7	5.5	29		15.0	22	1981				1941
TEMPÉRATURE MINIMALE LOWEST TEMPERATURE (MINIMUM)	°CELSIUS	-20.8	24	-24.0	15					-33.9	15	1943	1941
TEMPÉRATURE MENSUELLE MOYENNE MEAN MONTHLY TEMPERATURE	°CELSIUS	-6.5		-7.9		-8.9	-1.6		1981	-14.1		1993	1941
HAUTEUR TOTALE MENSUELLE DE PLUIE TOTAL MONTHLY RAINFALL	mm	6.6		2.8		18.4	87.0		1981	0.0		1993	1941
HAUTEUR TOTALE MENSUELLE DE NEIGE TOTAL MONTHLY SNOWFALL	cm	37.0		37.2		43.8	132.4		1960	11.4		1978	1941
PRÉCIPITATION TOTALE MENSUELLE TOTAL MONTHLY PRECIPITATION	mm	43.6		39.6		59.7	174.5		1960	7.7		1978	1941
NOMBRE DE JOURS AVEC PRECIPITATION MESURABLE NO OF DAYS WITH MEASURABLE PRECIPITATION		12		12		14	21		1960	2		1984	1941
HAUTEUR DE PLUIE MAXIMALE EN UNE JOURNÉE GREATEST RAINFALL IN ONE DAY	mm	3.6	16	1.4	21		31.5	25	1961				1941
HAUTEUR DE NEIGE MAXIMALE EN UNE JOURNÉE GREATEST SNOWFALL IN ONE DAY	cm	9.8	10	13.2	3		39.4	16	1954				1941
PRÉCIPITATION MAXIMALE EN UNE JOURNÉE GREATEST PRECIPITATION IN ONE DAY	mm	13.0	16	14.2	3		39.4	16	1954				1941
HAUTEUR DE PLUIE ENREGISTRÉE EN : MAXIMUM RAINFALL RECORDED IN :													
5 MINUTES	mm						1.0	24	1975				de/from
10 MINUTES	mm						1.3	9	1990				1943
15 MINUTES	mm						5.0	16	1983				à/to
30 MINUTES	mm						5.0	16	1983				1990
60 MINUTES	mm						5.3	22	1974				
24 HEURES CONSÉCUTIVE CONSECUTIVE HOURS	mm												
VITESSE MOYENNE DU VENT MEAN WIND SPEED	KM/H	12.7		17.2		15.0	22.2		1976	10.9		1987	1953
VITESSE MAXIMALE (MOYENNE SUR 2 MIN.) MAXIMUM SPEED (2 MIN. MEAN)	KM/H	NNE 46	10	WSW 54	4		NNE 80	26	1961				1953
POINTE DE VENT MAXIMALE MAXIMUM GUST SPEED	KM/H	NNE 61	10	WSW 69	4		WSW 138	25	1956				1955
TOTAL DES HEURES INSOLATION TOTAL HOURS OF SUNSHINE	HEURES	132.4		157.3		123.9	205.6		1987	73.7		1981	1969
PRESSION MOYENNE À LA STATION MEAN STATION PRESSURE	kPa	101.58		101.59		101.27	101.91		1955	100.31		1958	1953
PRESSION MAXIMALE À LA STATION GREATEST STATION PRESSURE	kPa	103.24	2	103.56	17		104.67	13	1981				1953
PRESSION MINIMALE À LA STATION LEAST STATION PRESSURE	kPa	99.50	12	99.33	21					96.58	25	1956	1953

DONNÉES CLIMATOLOGIQUES CE MOIS-CI POUR LES 10 DERNIÈRES ANNEES
CLIMATOLOGICAL DATA THIS MOUNTH FOR THE PAST 10 YEARS

ANNÉE YEAR	TEMPÉRATURE MAXIMALE MAXIMUM TEMP.	TEMPÉRATURE MINIMALE MINIMUM TEMPERATURE	TEMPÉRATURE MOYENNE MEAN TEMPERATURE	HAUTEUR DE PLUIE RAINFALL	HAUTEUR DE NEIGE SNOWFALL	PRÉCIPITATION TOTALE TOTAL PRECIPITATION	VITESSE MOYENNE DES VENTS MEAN WIND SPEED	VITESSE MAXIMALE DES VENTS MAXIMUM WIND SPEED	HEURES D'ENSOLEILLEMENT SUNSHINE HOURS	DEGRÉS-JOURS DE CHAUFFE HEATING DEGREE-DAYS	DEGRÉS-JOURS DE CROISSANCE GROWING DEGREE-DAYS	DEGRÉS-JOURS DE RÉFRIGÉRATION COOLING DEGREE-DAYS	A.S.N S.A.S
1996	7.5	-23.6	-7.9	52.4	17.4	72.7	14.9	WNW 52	133.3	752.3			176.1
1997	8.2	-28.3	-7.9	35.9	70.5	96.4	14.2	SW 50	106.4	725.3			206.3
1998	5.9	-19.7	-3.8	16.5	27.2	63.8	12.5	W 39	137.5	610.7			190.4
1999	9.1	-19.0	-5.1	20.6	15.5	44.3	13.2	SSE 41	152.8	647.1			122.8
2000	10.9	-21.6	-7.0	8.2	67.1	73.0	18.0	SW 54	149.3	725.4	2.2		154.8
2001	8.8	-23.3	-8.7	30.1	44.0	74.2	18.0	W 76	114.5	747.0			188.6
2002	11.4	-18.8	-5.0	18.2	19.0	41.2	18.5	SW 67	105.3	643.3	1.0		94.8
2003	4.1	-25.9	-10.8	19.0	31.9	62.8	19.4	WSW 63	149.7	805.6			131.9
2004	5.5	-24.0	-7.9	2.8	37.2	39.6	17.2	WSW 54	157.3	750.8			137.0
2005	6.4	-20.8	-6.5	6.6	37.0	43.6	12.7	NNE 46	132.4	686.7			128.4

Avis / Note :

* : Nouveau record / New record
\# : Station manuelle / Manual station
A.S.N : Accumulation Saisonnière de Neige / S.A.S = Season Accumulation Snowfall

TEMPÉRATURE / TEMPERATURE

TEMPÉRATURE HORAIRE
HOURLY TEMPERATURE

Montreal/P E Trudeau Int'l A

FEVRIER 2005
FEBRUARY 2005

DATE	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	-119	-141	-146	-137	-147	-154	-151	-138	-136	-138	-99	-86	-65	-54	-40	-36	-41	-44	-39	-35	-40	-43	-46	-41
2	-47	-45	-48	-49	-54	-56	-57	-58	-55	-47	-34	-30	-27	-20	-15	-10	-9	-11	-21	-32	-46	-32	-60	-73
3	-79	-84	-88	-91	-98	-92	-99	-100	-98	-89	-67	-50	-44	-32	-22	-17	-17	-23	-29	-35	-36	-38	-43	-50
4	-46	-50	-53	-79	-62	-76	-72	-103	-85	-64	-36	-16	2	15	19	19	22	10	2	-11	-34	-34	-30	-43
5	-65	-63	-64	-68	-63	-68	-59	-67	-58	-46	-31	-8	-2	10	10	11	3	-1	-19	-31	-30	-39	-46	-41
6	-51	-59	-59	-47	-68	-57	-58	-43	-57	-27	-16	-7	18	17	32	22	19	16	5	-3	-10	-13	-12	-14
7	-15	-18	-22	-25	-24	-24	-25	-25	-15	-3	20	32	44	53	60	54	55	45	36	39	35	33	30	34
8	32	29	27	24	40	21	18	15	16	18	20	26	25	24	18	32	26	25	24	27	25	23	21	21
9	22	19	16	12	7	3	1	-3	-3	-7	-10	-13	-10	-6	-3	-9	-13	-13	-10	-3	-5	-11	-19	-25
10	-34	-42	-46	-51	-51	-53	-57	-58	-60	-61	-60	-59	-57	-57	-45	-54	-54	-54	-52	-50	-50	-42	-53	-59
11	-84	-85	-81	-96	-97	-104	-112	-108	-106	-90	-67	-52	-15	-4	-2	-6	-9	-14	-29	-39	-48	-52	-56	-56
12	-67	-67	-75	-70	-62	-56	-54	-46	-43	-37	-29	-21	-12	-3	-2	1	1	-3	-3	-14	-32	-27	-25	-28
13	-26	-37	-50	-66	-75	-87	-106	-122	-123	-111	-103	-98	-88	-85	-78	-73	-77	-77	-86	-91	-97	-102	-104	-117
14	-120	-120	-114	-111	-111	-124	-119	-126	-112	-102	-89	-59	-49	-39	-22	-18	-10	-3	0	4	9	11	15	16
15	18	18	20	22	23	25	33	28	28	27	31	35	37	33	33	32	28	37	33	35	33	35	32	26
16	26	27	23	24	22	23	23	19	12	5	3	3	2	3	3	6	8	2	-3	-11	-17	-25	-32	-52
17	-69	-72	-79	-86	-88	-97	-112	-107	-98	-80	-71	-65	-61	-52	-31	-30	-43	-49	-59	-65	-68	-68	-65	-71
18	-67	-68	-64	-66	-74	-90	-86	-87	-84	-91	-94	-89	-108	-111	-118	-110	-118	-122	-129	-131	-137	-144	-147	-154
19	-163	-168	-169	-174	-178	-179	-182	-190	-177	-156	-140	-121	-106	-87	-78	-66	-57	-52	-56	-58	-60	-75	-91	-101
20	-116	-125	-132	-151	-159	-161	-182	-189	-165	-157	-152	-142	-137	-133	-131	-127	-126	-126	-127	-130	-142	-139	-135	-134
21	-127	-123	-133	-142	-143	-145	-145	-143	-143	-135	-122	-102	-75	-63	-61	-57	-51	-51	-80	-91	-88	-85	-86	-90
22	-88	-87	-86	-85	-86	-84	-81	-80	-79	-72	-66	-55	-51	-41	-36	-27	-22	-26	-29	-58	-60	-56	-63	-51
23	-54	-62	-71	-80	-92	-122	-131	-135	-124	-121	-115	-108	-98	-97	-90	-85	-82	-83	-90	-100	-108	-120	-140	-143
24	-131	-134	-143	-156	-161	-156	-178	-189	-174	-134	-104	-100	-97	-89	-88	-87	-88	-93	-95	-93	-107	-102	-104	-117
25	-119	-123	-131	-139	-147	-147	-146	-151	-142	-126	-119	-108	-94	-85	-76	-72	-55	-71	-81	-85	-95	-105	-121	-118
26	-134	-147	-154	-158	-152	-157	-180	-160	-153	-131	-106	-90	-69	-64	-50	-46	-52	-54	-65	-67	-76	-97	-109	-108
27	-123	-112	-134	-125	-120	-123	-120	-123	-116	-109	-97	-92	-83	-74	-63	-59	-54	-56	-70	-77	-84	-90	-103	-112
28	-109	-114	-116	-124	-137	-108	-105	-99	-92	-80	-70	-65	-62	-58	-60	-60	-61	-59	-59	-61	-62	-62	-63	-60
29																								
30																								
31																								

Avis / Note :

Unités / Units: 0.1 °C

M = Manquant / Missing

Lire / Read -123 = -12.3 °C -1 = -0.1 °C 0 = 0.0 °C 12 = +1.2 °C 123 = 12.3 °C

Heure normale locale : Est
Local standard time: Eastern

Si vous avez des questions, commentaires ou désirez recevoir de l'information sur les produits offerts pas Environnement Canada :
If you have questions, comments or wish information on products offered by Environment Canada:

Écrivez-nous à : *Write to us at :*

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Courrier éléctronique / Email : *Climat.Quebec@ec.gc.ca*
Renseignements climatologiques / Climate Information : 1-900-565-1111 (2,99 $ / minute)

VENTS / WINDS

VENTS HORAIRES (KM/H)
HOURLY WINDS (KM/H)

Montreal/P E Trudeau Int'l A

FEVRIER 2005
FEBRUARY 2005

DATE	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	RAFALE MAX PEAK GUST		
																										Heure Time	Jour Day
1	C 0	W 4	SSW 7	SW 11	C 0	N 4	C 0	SSW 11	SW 11	C 0	SSW 9	S 6	S 4	SW 4	SW 6	SSW 7	SW 11	SW 6	SSW 7	SSW 6	SW 9	SSW 7	SW 4	SW 4			
2	C 0	SW 6	SW 6	SW 7	SW 4	C 0	C 0	C 0	C 0	C 0	C 0	N 4	N 6	NNE 7	NNE 7	NNE 11	NNE 11	NE 11	NE 11	NNE 7	N 6	NE 11	NNE 7	N 7			
3	N 9	NNE 9	N 7	NNE 9	N 4	ENE 4	N 9	NNE 13	NE 13	NE 11	NNE 9	NNE 7	N 9	N 7	NNE 9	N 7	NNW 6	N 7	NNE 11	NNE 9	N 11	N 9	N 9	NNE 6			
4	N 7	N 7	C 0	C 0	NNE 6	NNW 7	C 0	C 0	NW 6	NNW 4	NNW 6	N 4	SW 4	WSW 4	SW 11	WSW 9	SW 9	WSW 7	SW 11	SW 11	SSW 7	C 0	W 4	SSW 7			
5	C 0	SW 6	SSW 7	S 7	SSW 9	SSW 7	WSW 7	W 7	W 4	NW 6	C 0	S 4	SSW 4	SW 7	SW 11	SSW 7	SW 11	SW 9	S 4	W 4	SE 4	C 0	C 0	ENE 6			
6	WNW 4	N 4	N 4	C 0	NE 6	N 7	N 11	ENE 13	N 6	C 0	NE 6	NNE 9	NE 7	ESE 6	ENE 6	NNE 11	NNE 9	NE 9	N 6	N 9	NNE 11	NNE 13	NNE 11	NNE 11			
7	N 6	NNE 7	NNE 9	NNW 9	NNE 11	N 6	C 0	C 0	C 0	C 0	C 0	C 0	C 0	SSE 4	SSW 6	S 7	C 0	SW 4	C 0	S 4	C 0	C 0	C 0	ESE 6			
8	ENE 6	ESE 6	C 0	C 0	NNE 7	C 0	N 7	N 6	C 0	SE 4	SSE 7	SSE 4	WNW 4	SSE 13	SE 4	SSW 11	SSE 4	WNW 4	SSE 13	SSE 9	W 15	WSW 13	SW 9	W 9			
9	W 15	W 13	W 17	W 19	W 19	W 17	W 13	W 13	W 13	W 15	WNW 15	W 6	NW 7	WNW 4	NNE 11	ESE 6	SSW 9	C 0	C 0	ENE 13	ENE 17	NE 26	NE 26	NE 31	NE 37	1	10
10	NE 26	NE 24	NNE 30	NE 33	NE 31	NNE 35	NNE 41	NNE 43	NE 39	NNE 46	NNE 44	NNE 35	NNE 35	NNE 39	NNE 35	NNE 33	NNE 33	NNE 26	NNE 30	N 19	N 15	N 28	N 24	N 19	NNE 61	9	10
11	NNW 13	NNW 15	NW 13	NW 13	NW 13	W 11	W 13	W 15	W 9	SW 17	WSW 15	SW 13	W 19	W 17	WNW 28	WNW 30	WNW 33	WNW 28	W 26	W 28	W 28	W 15	W 17	W 19	WNW 44	16	11
12	W 22	W 17	SSW 11	WSW 11	WSW 22	WSW 20	WSW 17	W 19	W 19	WSW 17	WSW 13	W 26	W 31	W 30	W 31	W 19	W 22	W 20	WSW 15	WNW 7	WNW 9	NW 9	WNW 11	WNW 9	W 33	12	12
13	NW 13	NW 17	NNW 17	NNE 17	NNE 15	NNW 22	NNW 13	NNW 9	NW 9	NNW 7	WNW 7	NW 7	W 9	SW 24	WSW 13	SW 20	SW 20	SW 15	SW 13	WSW 7	SW 11	SW 6	SW 9	SSW 9			
14	SSE 7	ESE 7	ESE 4	E 7	E 9	E 9	E 15	E 9	E 6	NE 20	NE 17	E 15	E 22	ESE 28	SE 26	SE 35	SE 43	SSE 35	SE 37	SSE 35	SSE 33	SSE 30	SSE 37	SSE 30	SE 57	16	14
15	SE 24	SSE 24	SSE 22	SSE 22	SSE 30	S 17	SW 28	SW 31	SW 41	WSW 28	WSW 30	WSW 31	SW 39	SW 22	SSW 20	SSW 11	SSW 11	WSW 4	SSW 11	SW 7	S 13	SSW 17	SSW 15	S 13	SW 56	8	15
16	S 9	SW 6	ESE 4	SE 6	C 0	N 9	N 13	N 7	NNW 13	N 11	NNW 13	N 11	WNW 9	W 11	WNW 13	WNW 15	W 15	NW 15	NW 15	NW 19	NNW 11	NNW 19	NW 17	WNW 13	NW 32	19	16
17	W 7	WNW 9	W 9	W 11	W 13	WNW 7	NW 15	N 4	N 7	C 0	C 0	NNE 7	C 0	NNE 4	NNW 4	WSW 9	WSW 6	S 7	SSE 9	SSE 13	SE 7	ESE 7	SE 9	SE 11			
18	E 4	C 0	ENE 4	C 0	NNE 9	N 7	N 4	W 6	WSW 19	WSW 24	WSW 24	WSW 24	WSW 30	WSW 33	WSW 35	WSW 26	W 28	WSW 28	WSW 26	W 26	W 19	W 19	W 15	W 15	WSW 44	14	18
19	W 13	W 15	WSW 11	WSW 9	SW 11	SW 13	W 17	W 7	W 11	SW 19	SW 19	SW 22	SW 19	SSW 20	SSW 17	SW 13	WSW 22	SW 26	SW 22	WSW 22	WNW 17	NW 15	NW 13	NW 17	SW 33	18	19
20	NW 13	WNW 11	NNW 19	NW 9	NNW 9	N 15	N 7	NNW 7	NW 4	W 9	W 9	W 11	W 13	WSW 11	SW 17	SW 17	SSW 15	SW 9	SW 9	ESE 6	ESE 9	ESE 9	ESE 13	E 11			
21	E 15	NE 15	NE 19	NE 26	NE 28	NE 30	NE 30	NE 26	NE 30	NE 30	NE 24	NE 22	ENE 19	E 17	E 22	E 24	E 19	E 13	N 15	NNE 11	N 13	N 17	NNE 22	N 13	NE 39	6	21
22	N 11	N 13	N 9	WNW 9	W 9	W 7	SW 6	SW 9	SW 11	WSW 11	C 0	W 9	SSW 9	S 11	SW 11	SW 11	SW 9	WSW 7	W 9	WNW 4	W 7	C 0	SW 4	WNW 7			
23	NW 9	WNW 13	NW 11	WNW 13	NW 13	WNW 9	WNW 9	NW 7	N 7	NNW 13	WNW 11	W 15	W 13	WSW 24	W 22	W 24	W 22	W 22	WSW 17	W 20	W 13	W 15	W 9	WNW 9	W 33	14	23
24	NW 7	C 0	N 4	C 0	N 7	C 0	C 0	N 6	N 7	NNE 7	NE 7	E 7	NE 7	NE 6	NE 6	NE 11	ENE 11	E 13	NE 17	NE 9	NNE 13	ENE 15	NE 11	NNE 15			
25	NNE 13	NNE 15	NNE 15	NNE 15	NNE 13	NNE 17	NNE 13	NNE 19	NNE 17	NNE 20	NE 15	NNE 9	N 7	ENE 4	NE 9	ENE 6	C 0	SW 9	WSW 9	SW 11	WSW 6	WSW 4	WSW 6	SW 4			
26	SSW 7	SW 9	W 4	WSW 7	C 0	C 0	W 6	C 0	N 4	N 6	NNE 4	E 4	C 0	C 0	C 0	C 0	SW 13	SW 15	SW 13	SW 7	W 15	W 13	W 11	W 11			
27	W 7	W 9	W 11	W 9	W 15	W 15	W 17	WNW 15	WNW 24	W 22	W 22	WSW 26	W 28	W 33	W 26	W 28	W 28	W 24	WSW 24	WSW 19	W 19	WSW 6	ESE 6	WSW 4	W 44	14	27
28	WSW 7	SW 11	C 0	ENE 4	C 0	E 7	ESE 6	ESE 7	E 9	E 13	NE 24	NE 24	NE 22	ENE 24	NE 30	NE 26	NE 28	NE 30	NE 30	NE 31	NE 31	NE 30	NE 28	NE 26	NE 39	18	28
29																											
30																											
31																											

Avis / Note:

C = Calme / Calm

M = Manquant / Missing

Heure normale locale : Est
Local standard time : Eastern

HUMIDITÉ / HUMIDITY

POINTS DE ROSÉE HORAIRES
HOURLY DEW POINTS

Montreal/P E Trudeau Int'l A

FEVRIER 2005
FEBRUARY 2005

DATE	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	-150	-163	-166	-152	-162	-168	-169	-155	-148	-159	-144	-137	-129	-132	-127	-123	-121	-109	-105	-101	-95	-89	-84	-90
2	-82	-85	-81	-91	-84	-82	-81	-79	-78	-75	-72	-71	-72	-71	-71	-66	-64	-76	-79	-80	-87	-84	-91	-96
3	-103	-108	-111	-113	-119	-109	-115	-115	-113	-105	-92	-86	-85	-80	-76	-71	-69	-74	-78	-85	-80	-82	-89	-91
4	-89	-93	-95	-108	-99	-105	-104	-123	-106	-95	-85	-92	-83	-84	-69	-74	-78	-86	-94	-86	-82	-88	-89	-91
5	-93	-88	-93	-96	-94	-97	-78	-79	-67	-59	-59	-55	-49	-44	-46	-45	-49	-51	-49	-58	-50	-59	-60	-58
6	-67	-74	-74	-60	-83	-67	-67	-58	-69	-47	-40	-39	-30	-30	-32	-24	-26	-28	-30	-33	-36	-40	-41	-41
7	-40	-43	-48	-46	-48	-47	-48	-45	-36	-25	-27	-26	-24	-20	-35	-26	-33	-26	-30	-27	-25	-23	-27	-23
8	-22	-15	-15	-14	-21	-9	-10	-7	1	1	5	17	-20	19	1	26	17	-20	19	22	21	18	16	17
9	18	14	10	3	-7	-13	-17	-21	-24	-31	-30	-29	-26	-29	-49	-32	-35	-36	-35	-67	-71	-64	-76	-81
10	-68	-59	-61	-68	-67	-70	-72	-74	-75	-77	-75	-72	-70	-71	-62	-67	-68	-65	-63	-64	-65	-104	-151	-132
11	-135	-141	-143	-148	-153	-163	-163	-162	-160	-149	-133	-123	-132	-120	-112	-125	-125	-134	-125	-118	-121	-125	-127	-130
12	-128	-128	-126	-115	-103	-95	-84	-64	-64	-60	-55	-57	-57	-58	-62	-61	-58	-57	-58	-51	-47	-54	-56	-56
13	-60	-80	-75	-91	-131	-145	-164	-167	-168	-165	-163	-160	-167	-149	-150	-143	-151	-156	-153	-156	-158	-157	-159	-152
14	-153	-156	-151	-148	-146	-145	-155	-155	-145	-150	-141	-136	-126	-108	-89	-85	-71	-63	-42	-23	-16	-9	-8	-5
15	-2	1	4	6	9	9	9	10	3	1	-2	-1	-2	-3	0	1	3	3	3	4	2	4	17	18
16	19	19	17	21	21	21	18	15	7	1	0	0	0	1	0	3	2	-3	-12	-31	-30	-60	-70	-80
17	-96	-101	-108	-109	-114	-120	-128	-126	-127	-122	-132	-137	-134	-120	-116	-108	-107	-97	-103	-118	-115	-110	-101	-106
18	-107	-105	-110	-90	-87	-105	-99	-98	-101	-118	-117	-114	-140	-137	-146	-148	-157	-160	-159	-175	-181	-195	-197	-201
19	-223	-223	-226	-227	-229	-229	-228	-232	-223	-217	-208	-202	-198	-172	-152	-128	-115	-109	-83	-68	-75	-131	-155	-185
20	-195	-199	-210	-230	-248	-253	-254	-253	-254	-244	-254	-254	-251	-247	-238	-238	-239	-227	-236	-231	-228	-224	-219	-219
21	-224	-219	-215	-219	-219	-198	-184	-179	-174	-162	-151	-126	-93	-76	-77	-75	-69	-69	-98	-107	-104	-101	-104	-107
22	-107	-105	-104	-105	-107	-105	-104	-101	-91	-91	-91	-86	-87	-83	-79	-70	-67	-66	-64	-79	-83	-75	-84	-70
23	-73	-90	-107	-117	-128	-147	-155	-156	-160	-175	-166	-167	-158	-160	-154	-155	-151	-155	-158	-156	-160	-167	-183	-179
24	-168	-169	-172	-180	-185	-183	-193	-214	-194	-166	-163	-181	-173	-173	-178	-181	-185	-183	-186	-190	-178	-192	-192	-179
25	-176	-182	-184	-191	-198	-212	-213	-213	-205	-187	-180	-177	-167	-169	-166	-162	-183	-154	-158	-153	-160	-157	-162	-156
26	-172	-169	-181	-193	-189	-192	-208	-187	-185	-177	-168	-202	-152	-161	-158	-165	-156	-162	-156	-161	-168	-167	-167	-165
27	-177	-178	-186	-185	-184	-186	-191	-197	-194	-194	-182	-185	-178	-175	-172	-177	-172	-170	-161	-152	-168	-172	-176	-189
28	-191	-190	-196	-192	-193	-165	-155	-154	-159	-163	-158	-160	-157	-159	-155	-163	-159	-162	-158	-156	-162	-165	-158	-150
29																								
30																								
31																								

Avis / Note: Unités / Units : 0,1 °C M = Manquant / Missing

HUMIDITÉS RELATIVES HORAIRES RELEVÉE À
HOURLY RELATIVE HUMIDITIES AT

DATE	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	78	83	85	88	88	89	86	87	91	84	70	66	60	54	51	51	54	60	60	60	65	70	75	69
2	76	74	78	72	79	82	83	85	84	81	75	73	71	68	66	66	66	61	64	69	73	67	79	84
3	83	83	83	84	85	87	88	89	89	88	82	76	73	69	66	66	68	68	69	68	71	71	70	73
4	72	72	72	80	75	80	78	85	85	79	69	56	53	48	52	50	47	49	48	57	69	66	64	69
5	80	82	80	80	79	80	86	91	93	91	81	70	71	67	66	66	68	69	80	82	86	86	90	88
6	88	89	89	91	89	93	93	89	91	86	84	79	70	71	63	72	72	72	77	80	82	82	81	82
7	83	83	82	85	84	84	84	86	86	85	71	66	61	59	50	56	53	60	62	62	65	67	66	66
8	68	73	74	76	64	80	82	85	90	88	90	94	72	96	88	96	94	72	96	97	97	96	96	97
9	97	96	96	94	90	89	88	88	86	84	86	89	89	84	71	84	85	84	83	62	61	67	65	65
10	77	88	89	88	88	88	89	88	89	88	89	90	90	90	88	91	90	92	92	90	89	62	46	56
11	66	64	61	66	63	62	66	64	64	62	59	57	40	41	43	40	41	39	47	54	56	56	57	56
12	62	62	67	70	73	74	79	87	85	84	82	76	71	66	64	63	64	67	66	76	89	82	79	81
13	77	72	83	82	64	63	62	69	69	64	61	60	53	60	56	57	55	53	58	59	61	64	64	75
14	76	74	74	74	75	84	74	79	76	68	66	54	55	59	60	60	63	64	73	82	83	86	85	86
15	87	88	89	89	90	89	84	88	84	83	79	77	76	77	79	80	84	78	81	80	80	80	90	94
16	95	94	96	98	99	99	96	97	96	97	98	98	99	99	98	98	96	96	94	86	91	77	75	81
17	81	80	80	83	81	83	88	86	79	72	62	56	56	59	52	55	61	69	71	66	69	72	75	76
18	73	75	70	83	90	89	90	92	87	81	83	82	77	81	80	73	73	73	78	69	69	65	66	67
19	60	62	61	63	64	65	67	69	67	59	56	51	47	50	55	61	63	64	81	93	89	64	60	50
20	52	54	52	51	46	45	53	57	46	47	41	38	37	37	40	39	38	42	39	42	48	48	49	49
21	44	44	50	52	52	64	72	74	77	80	79	82	87	90	88	87	87	87	87	88	88	88	87	87
22	86	87	87	85	85	85	83	85	91	86	82	79	76	72	72	72	71	74	77	85	84	86	85	86
23	86	80	75	75	75	82	82	84	74	64	66	62	61	60	60	57	57	56	58	63	65	68	70	74
24	74	75	78	82	82	80	88	80	84	77	62	51	54	50	48	46	45	48	47	45	56	47	48	60
25	62	61	64	65	65	57	57	59	59	60	60	57	55	51	48	48	36	51	54	58	59	65	71	73
26	73	83	80	74	73	74	79	80	76	68	60	40	51	46	42	39	44	42	48	47	48	56	62	63
27	64	58	65	61	59	59	55	54	52	49	50	47	46	44	42	39	39	40	48	55	51	51	55	53
28	51	53	51	57	62	63	67	64	58	51	49	47	47	45	47	44	46	44	45	47	45	44	47	49
29																								
30																								
31																								

Avis / Note: Unités / Units : pourcent /percent (%) M = Manquant / Missing

- Résumé / Summary -

Sommaire quotidien de février 2005
Aéroport International de Montréal/Dorval

Date	
1 -	Continuation de l'é pisode de smog débuté le 31 janvier 2005. Ennuagement en soirée.
2 -	Smog. Doux.
3 -	Smog. Doux.
4 -	Smog. Ensoleillé. Très doux.
5 -	Smog. Généralement ensoleillé. Très doux.
6 -	Smog. Très doux.
7 -	Smog. Très doux.
8 -	Fin de l'épisode de smog. Pluie ou bruine intermittente débutant le matin et cessant en soirée. Très doux.
9 -	Faible neige en matinée et en fin de journée. Très doux.
10 -	Neige cessant en soirée. Doux. Venteux causant de la poudrerie.
11 -	Ensoleillé. Doux.
12 -	Neige intermittente. Doux.
13 -	Neige cessant durant la nuit. Ensoleillé.
14 -	Faible neige débutant en après-midi, se transformant en grésil en soirée puis en pluie. Doux. Venteux.
15 -	Faible pluie se terminant le matin et recommençant en fin de journée. Très doux. Venteux.
16 -	Pluie débutant tôt la nuit devenant mêlée au grésil et à la neige le matin, se changeant en neige en matinée et se terminant en soirée. Le tout accompagné de brouillard. Très doux.
17 -	Ensoleillé. Ennuagement graduel. Faible neige débutant en fin de journée. Doux.
18 -	Neige cessant en soirée.
19 -	Averses de neige débutant en après-midi et se terminant en soirée.
20 -	Ensoleillé. Froid.
21 -	Faible neige débutant en matinée. Venteux.
22 -	Neige se terminant en fin de matinée. Quelques flocons en fin de journée.
23 -	Ensoleillé.
24 -	Ensoleillé. Froid.
25 -	Ensoleillé.
26 -	Généralement ensoleillé.
27 -	Ensoleillé. Froid.
28 -	Couvert. Froid.

Daily summary for February 2005
Montreal/Dorval International Airport

Date	
1 -	Continuation of smog event beginning January 31th, 2005. Clouding over in the evening.
2 -	Smog. Mild.
3 -	Smog. Mild.
4 -	Smog. Sunny. Very mild.
5 -	Smog. Generally sunny. Very mild.
6 -	Smog. Very mild.
7 -	Smog. Very mild.
8 -	End of smog event. Intermittent rain or drizzle beginning in the morning and ending at the end of the day. Very mild.
9 -	Light snow during the morning and at the end of the day. Very mild.
10 -	Snow ending in the evening. Mild. Windy causing blowing snow.
11 -	Sunny. Mild.
12 -	Intermittent snow. Mild.
13 -	Snow ending during the night. Sunny.
14 -	Light snow beginning in the afternoon, changing into ice pellets in the evening then into rain. Mild. Windy.
15 -	Light rain ending early in the morning and then starting over at the end of the day. Very mild. Windy.
16 -	Rain beginning early in the night, becoming mixed with ice pellets and snow early in the morning, changing into snow around mid-morning and ending in the evening. Foggy. Very mild.
17 -	Sunny. Increasing cloudiness. Light snow beginning at the end of the day. Mild.
18 -	Snow ending in the evening.
19 -	Snow showers beginning in the afternoon and ending in the evening.
20 -	Sunny. Cold.
21 -	Light snow beginning in the morning. Windy.
22 -	Snow ending at the end of the morning. Few flurries at the end of the day.
23 -	Sunny.
24 -	Sunny. Cold.
25 -	Sunny.
26 -	Mostly sunny.
27 -	Sunny. Cold.
28 -	Overcast. Cold.

APPENDIX E

PRECIPITATION PROBABILITY TABLES

APPENDIX E

PRECIPITATION PROBABILITY TABLES

LIGHT FREEZING RAIN / DRIZZLE

ICE PELLETS

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Table E1: Probability (%) of Freezing Rain/Drizzle Occurrences – 1996-97 to 2014-15

TEMP °C	RATE OF PRECIPITATION (g/dm²/h)																								
	0 to 1	1 to 2	2 to 3	3 to 4	4 to 5	5 to 6	6 to 7	7 to 8	8 to 9	9 to 10	10 to 11	11 to 12	12 to 13	13 to 14	14 to 15	15 to 16	16 to 17	17 to 18	18 to 19	19 to 20	20 to 21	21 to 22	22 to 23	23 to 24	24 to 25	25 to 26
above 0	1.5%	2.5%	1.7%	1.2%	0.6%	0.5%	0.6%	0.4%	0.3%	0.2%	0.2%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.2%	0.2%	0.2%	0.1%	0.2%	0.0%
0 to -1	3.5%	5.0%	2.2%	1.4%	0.9%	1.0%	0.9%	0.7%	0.5%	0.4%	0.5%	0.6%	0.7%	0.7%	0.5%	0.5%	0.5%	0.4%	0.4%	0.4%	0.3%	0.3%	0.2%	0.2%	0.3%	0.0%
-1 to -2	2.6%	2.6%	0.9%	0.7%	0.4%	0.5%	0.5%	0.3%	0.2%	0.1%	0.2%	0.3%	0.3%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.1%	0.1%	0.1%	0.0%	0.1%	0.0%
-2 to -3	2.1%	2.4%	0.9%	0.8%	0.5%	0.6%	0.3%	0.3%	0.3%	0.2%	0.3%	0.4%	0.4%	0.4%	0.3%	0.2%	0.2%	0.3%	0.3%	0.2%	0.1%	0.1%	0.1%	0.0%	0.1%	0.0%
-3 to -4	0.9%	1.9%	0.9%	0.6%	0.7%	0.5%	0.4%	0.4%	0.5%	0.3%	0.2%	0.2%	0.2%	0.3%	0.4%	0.4%	0.3%	0.2%	0.2%	0.2%	0.1%	0.1%	0.1%	0.1%	0.1%	0.0%
-4 to -5	1.3%	1.4%	0.5%	0.9%	0.5%	0.4%	0.5%	0.2%	0.3%	0.3%	0.1%	0.1%	0.3%	0.3%	0.3%	0.1%	0.1%	0.2%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-5 to -6	1.4%	0.9%	0.5%	0.3%	0.1%	0.4%	0.3%	0.1%	0.2%	0.1%	0.3%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.1%	0.1%	0.2%	0.1%	0.1%	0.1%	0.0%	0.1%	0.0%
-6 to -7	0.9%	0.5%	0.2%	0.3%	0.2%	0.1%	0.3%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.2%	0.2%	0.1%	0.1%	0.1%	0.1%	0.1%	0.0%	0.1%	0.0%	0.0%	0.0%
-7 to -8	0.2%	0.2%	0.1%	0.1%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%
-8 to -9	0.3%	0.4%	0.2%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%
-9 to -10	0.1%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-10 to -11	0.1%	0.4%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-11 to -12	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-12 to -13	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-13 to -14	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-14 to -15	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-15 to -16	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-16 to -17	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-17 to -18	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-18 to -19	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-19 to -20	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-20 to -21	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-21 to -22	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-22 to -23	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-23 to -24	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-24 to -25	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
TOTAL	**14.9%**	**18.6%**	**8.2%**	**6.4%**	**4.0%**	**4.1%**	**3.9%**	**2.5%**	**2.4%**	**1.8%**	**2.1%**	**2.6%**	**2.6%**	**2.6%**	**2.4%**	**2.3%**	**2.1%**	**1.9%**	**2.0%**	**1.9%**	**0.9%**	**1.0%**	**0.8%**	**0.8%**	**0.9%**	**0.2%**
CUMULATIVE	**14.9%**	**33.5%**	**41.7%**	**48.0%**	**52.1%**	**56.1%**	**60.0%**	**62.5%**	**64.9%**	**66.8%**	**68.9%**	**71.5%**	**74.1%**	**76.7%**	**79.2%**	**81.5%**	**83.6%**	**85.5%**	**87.5%**	**89.4%**	**90.3%**	**91.3%**	**92.1%**	**92.9%**	**93.8%**	**94.0%**

Table E1: Probability (%) of Freezing Rain/Drizzle Occurrences – 1996-97 to 2014-15 (cont'd)

TEMP °C	RATE OF PRECIPITATION (g/dm²/h)																										
	26 to 27	27 to 28	28 to 29	29 to 30	30 to 31	31 to 32	32 to 33	33 to 34	34 to 35	35 to 36	36 to 37	37 to 38	38 to 39	39 to 40	40 to 41	41 to 42	42 to 43	43 to 44	44 to 45	45 to 46	46 to 47	47 to 48	48 to 49	49 to 50	50 to 51	51 to 52	52 to 53
above 0	0.1%	0.1%	0.0%	0.1%	0.2%	0.1%	0.1%	0.2%	0.1%	0.1%	0.1%	0.0%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%
0 to -1	0.1%	0.1%	0.0%	0.1%	0.2%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.0%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%
-1 to -2	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-2 to -3	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%
-3 to -4	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-4 to -5	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-5 to -6	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-6 to -7	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-7 to -8	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-8 to -9	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-9 to -10	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-10 to -11	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-11 to -12	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-12 to -13	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-13 to -14	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-14 to -15	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-15 to -16	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-16 to -17	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-17 to -18	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-18 to -19	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-19 to -20	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-20 to -21	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-21 to -22	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-22 to -23	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-23 to -24	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-24 to -25	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
TOTAL	**0.5%**	**0.3%**	**0.2%**	**0.4%**	**0.7%**	**0.3%**	**0.2%**	**0.4%**	**0.3%**	**0.2%**	**0.3%**	**0.1%**	**0.1%**	**0.3%**	**0.3%**	**0.1%**	**0.1%**	**0.1%**	**0.1%**	**0.1%**	**0.0%**	**0.0%**	**0.0%**	**0.3%**	**0.0%**	**0.0%**	**0.0%**
CUMULATIVE	**94.5%**	**94.8%**	**94.9%**	**95.3%**	**96.0%**	**96.3%**	**96.5%**	**96.9%**	**97.2%**	**97.4%**	**97.7%**	**97.8%**	**97.9%**	**98.2%**	**98.5%**	**98.6%**	**98.6%**	**98.7%**	**98.8%**	**98.9%**	**98.9%**	**98.9%**	**98.9%**	**99.3%**	**99.3%**	**99.3%**	**99.3%**

Table E1: Probability (%) of Freezing Rain/Drizzle Occurrences – 1996-97 to 2014-15 (cont'd)

TEMP °C	RATE OF PRECIPITATION (g/dm²/h)																								
	53 to 54	54 to 55	55 to 56	56 to 57	57 to 58	58 to 59	59 to 60	60 to 61	61 to 62	62 to 63	63 to 64	64 to 65	65 to 66	66 to 67	67 to 68	68 to 69	69 to 70	70 to 71	71 to 72	72 to 73	73 to 74	74 to 75	>75	TOTAL	CUMULATIVE
above 0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	**15.7%**	**15.7%**
0 to -1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**24.7%**	**40.5%**
-1 to -2	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**11.9%**	**52.4%**
-2 to -3	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**12.5%**	**64.9%**
-3 to -4	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**10.6%**	**75.5%**
-4 to -5	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**8.4%**	**83.8%**
-5 to -6	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**6.7%**	**90.6%**
-6 to -7	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**4.6%**	**95.2%**
-7 to -8	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**1.5%**	**96.6%**
-8 to -9	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**1.9%**	**98.5%**
-9 to -10	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.4%**	**98.9%**
-10 to -11	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.7%**	**99.7%**
-11 to -12	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.2%**	**99.9%**
-12 to -13	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**99.9%**
-13 to -14	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.1%**	**100.0%**
-14 to -15	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-15 to -16	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-16 to -17	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-17 to -18	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-18 to -19	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-19 to -20	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-20 to -21	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-21 to -22	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-22 to -23	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-23 to -24	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-24 to -25	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
TOTAL	**0.0%**	**0.0%**	**0.1%**	**0.0%**	**0.0%**	**0.0%**	**0.1%**	**0.1%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.1%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.2%**		
CUMULATIVE	**99.3%**	**99.3%**	**99.4%**	**99.4%**	**99.4%**	**99.4%**	**99.5%**	**99.6%**	**99.6%**	**99.6%**	**99.6%**	**99.6%**	**99.6%**	**99.7%**	**99.7%**	**99.7%**	**99.7%**	**99.8%**	**99.8%**	**99.8%**	**99.8%**	**99.8%**	**100.0%**		

Table E2: Probability (%) of Sole Ice Pellet Occurrences – 2006-07 to 2014-15

TEMP °C	RATE OF PRECIPITATION (g/dm²/h)																								
	0 to 1	1 to 2	2 to 3	3 to 4	4 to 5	5 to 6	6 to 7	7 to 8	8 to 9	9 to 10	10 to 11	11 to 12	12 to 13	13 to 14	14 to 15	15 to 16	16 to 17	17 to 18	18 to 19	19 to 20	20 to 21	21 to 22	22 to 23	23 to 24	24 to 25	25 to 26
above 0	8.5%	6.6%	2.4%	1.8%	1.4%	1.6%	0.9%	1.2%	0.8%	0.6%	0.4%	0.4%	0.6%	0.2%	0.3%	0.5%	0.4%	0.2%	0.4%	0.8%	0.2%	0.4%	0.1%	0.3%	1.0%	0.0%
0 to -1	3.1%	2.2%	1.4%	0.4%	1.1%	1.1%	1.7%	0.7%	0.8%	0.9%	1.2%	0.8%	1.5%	1.2%	0.9%	1.1%	0.9%	0.6%	0.2%	0.2%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%
-1 to -2	3.8%	3.7%	1.1%	0.0%	0.8%	1.0%	1.5%	0.6%	0.7%	0.8%	1.2%	1.0%	1.7%	1.9%	2.2%	1.9%	0.7%	0.4%	0.1%	0.1%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%
-2 to -3	0.0%	1.1%	2.0%	1.4%	0.0%	0.2%	0.0%	0.4%	0.1%	0.0%	0.0%	0.6%	0.3%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-3 to -4	0.0%	0.0%	0.2%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-4 to -5	0.0%	0.0%	0.0%	0.0%	0.4%	0.4%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	0.5%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-5 to -6	3.3%	0.1%	0.0%	0.0%	0.4%	0.2%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.4%	0.2%	0.1%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-6 to -7	0.0%	0.0%	0.0%	1.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-7 to -8	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-8 to -9	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-9 to -10	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-10 to -11	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-11 to -12	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-12 to -13	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-13 to -14	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-14 to -15	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-15 to -16	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-16 to -17	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-17 to -18	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-18 to -19	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-19 to -20	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-20 to -21	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-21 to -22	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-22 to -23	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-23 to -24	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-24 to -25	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
TOTAL	18.7%	13.7%	7.1%	4.6%	4.6%	4.6%	4.4%	3.0%	2.6%	2.4%	2.8%	2.8%	4.3%	4.4%	4.2%	3.9%	2.3%	1.4%	0.8%	1.2%	0.5%	0.4%	0.2%	0.4%	1.0%	0.0%
CUMULATIVE	18.7%	32.4%	39.4%	44.1%	48.6%	53.3%	57.6%	60.6%	63.2%	65.6%	68.3%	71.1%	75.5%	79.9%	84.1%	88.0%	90.3%	91.6%	92.4%	93.6%	94.1%	94.5%	94.7%	95.1%	96.1%	96.1%

Table E2: Probability (%) of Sole Ice Pellet Occurrences – 2006-07 to 2014-15 (cont'd)

TEMP °C	RATE OF PRECIPITATION (g/dm²/h)																										
	26 to 27	27 to 28	28 to 29	29 to 30	30 to 31	31 to 32	32 to 33	33 to 34	34 to 35	35 to 36	36 to 37	37 to 38	38 to 39	39 to 40	40 to 41	41 to 42	42 to 43	43 to 44	44 to 45	45 to 46	46 to 47	47 to 48	48 to 49	49 to 50	50 to 51	51 to 52	52 to 53
above 0	0.3%	0.0%	0.2%	0.2%	0.5%	0.2%	0.1%	0.1%	0.1%	0.1%	0.2%	0.0%	0.0%	0.2%	0.2%	0.0%	0.0%	0.1%	0.2%	0.0%	0.0%	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%
0 to -1	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-1 to -2	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-2 to -3	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-3 to -4	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-4 to -5	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-5 to -6	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-6 to -7	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-7 to -8	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-8 to -9	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-9 to -10	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-10 to -11	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-11 to -12	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-12 to -13	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-13 to -14	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-14 to -15	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-15 to -16	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-16 to -17	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-17 to -18	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-18 to -19	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-19 to -20	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-20 to -21	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-21 to -22	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-22 to -23	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-23 to -24	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-24 to -25	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
TOTAL	0.4%	0.0%	0.2%	0.2%	0.6%	0.2%	0.1%	0.2%	0.2%	0.2%	0.2%	0.1%	0.1%	0.3%	0.2%	0.0%	0.0%	0.1%	0.3%	0.1%	0.0%	0.0%	0.0%	0.3%	0.0%	0.0%	0.0%
CUMULATIVE	96.4%	96.4%	96.7%	96.9%	97.5%	97.7%	97.8%	98.0%	98.2%	98.3%	98.6%	98.7%	98.8%	99.1%	99.2%	99.3%	99.3%	99.3%	99.6%	99.7%	99.7%	99.7%	99.7%	100.0%	100.0%	100.0%	100.0%

Table E2: Probability (%) of Sole Ice Pellet Occurrences – 2006-07 to 2014-15 (cont'd)

TEMP °C	RATE OF PRECIPITATION (g/dm²/h)																								
	53 to 54	54 to 55	55 to 56	56 to 57	57 to 58	58 to 59	59 to 60	60 to 61	61 to 62	62 to 63	63 to 64	64 to 65	65 to 66	66 to 67	67 to 68	68 to 69	69 to 70	70 to 71	71 to 72	72 to 73	73 to 74	74 to 75	>75	TOTAL	CUMULATIVE
above 0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**35.2%**	**35.2%**
0 to -1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**23.0%**	**58.2%**
-1 to -2	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**25.6%**	**83.8%**
-2 to -3	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**6.5%**	**90.3%**
-3 to -4	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.6%**	**90.9%**
-4 to -5	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**2.2%**	**93.1%**
-5 to -6	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**5.1%**	**98.2%**
-6 to -7	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**1.8%**	**100.0%**
-7 to -8	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-8 to -9	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-9 to -10	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-10 to -11	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-11 to -12	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-12 to -13	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-13 to -14	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-14 to -15	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-15 to -16	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-16 to -17	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-17 to -18	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-18 to -19	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-19 to -20	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-20 to -21	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-21 to -22	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-22 to -23	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-23 to -24	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-24 to -25	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
TOTAL	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**		
CUMULATIVE	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**		

Table E3: Probability (%) of Ice Pellets Mixed with Freezing Rain/Drizzle Occurrences – 2006-07 to 2014-15

TEMP °C	RATE OF PRECIPITATION (g/dm²/h)																								
	0 to 1	1 to 2	2 to 3	3 to 4	4 to 5	5 to 6	6 to 7	7 to 8	8 to 9	9 to 10	10 to 11	11 to 12	12 to 13	13 to 14	14 to 15	15 to 16	16 to 17	17 to 18	18 to 19	19 to 20	20 to 21	21 to 22	22 to 23	23 to 24	24 to 25	25 to 26
above 0	0.0%	2.2%	1.7%	0.1%	0.1%	0.1%	0.3%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.0%	0.1%	0.1%	0.0%	0.1%	0.0%	0.0%	0.1%	0.2%	0.1%	0.0%
0 to -1	11.2%	2.2%	7.9%	0.4%	0.3%	0.3%	0.4%	0.7%	1.1%	0.5%	0.7%	0.6%	0.5%	0.3%	0.3%	0.2%	0.2%	0.2%	0.0%	0.5%	0.0%	0.2%	0.2%	0.7%	0.6%	0.0%
-1 to -2	0.9%	9.8%	3.3%	0.2%	0.2%	0.2%	0.2%	0.5%	0.3%	0.0%	1.6%	0.0%	0.3%	0.2%	0.2%	0.2%	0.3%	0.2%	0.2%	0.0%	0.2%	0.2%	0.0%	0.0%	0.0%	0.0%
-2 to -3	2.1%	1.7%	1.2%	2.0%	1.4%	0.9%	0.6%	0.2%	0.3%	0.3%	0.4%	0.4%	1.4%	0.9%	0.3%	0.1%	0.3%	0.3%	0.3%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%
-3 to -4	0.0%	0.9%	2.0%	0.7%	0.5%	0.3%	1.4%	1.6%	0.5%	0.3%	0.3%	0.2%	0.2%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-4 to -5	3.9%	1.4%	0.0%	2.5%	0.7%	0.7%	0.3%	0.3%	0.3%	0.1%	0.5%	0.1%	1.2%	0.5%	1.0%	0.6%	0.3%	0.1%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-5 to -6	0.0%	0.0%	0.0%	0.0%	0.1%	0.3%	0.0%	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%	0.3%	0.5%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-6 to -7	1.4%	1.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-7 to -8	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-8 to -9	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-9 to -10	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-10 to -11	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-11 to -12	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-12 to -13	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-13 to -14	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-14 to -15	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-15 to -16	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-16 to -17	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-17 to -18	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-18 to -19	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-19 to -20	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-20 to -21	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-21 to -22	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-22 to -23	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-23 to -24	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-24 to -25	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
TOTAL	19.6%	19.8%	16.0%	5.8%	3.3%	2.8%	3.1%	3.4%	3.0%	1.4%	3.7%	1.4%	3.7%	2.1%	2.3%	1.3%	1.6%	1.1%	0.6%	0.8%	0.2%	0.4%	0.3%	0.9%	0.7%	0.0%
CUMULATIVE	19.6%	39.4%	55.4%	61.2%	64.4%	67.3%	70.3%	73.8%	76.8%	78.2%	81.8%	83.2%	86.9%	88.9%	91.2%	92.5%	94.2%	95.2%	95.8%	96.6%	96.8%	97.2%	97.5%	98.4%	99.1%	99.1%

Table E3: Probability (%) of Ice Pellets Mixed with Freezing Rain/Drizzle Occurrences – 2006-07 to 2014-15 (cont'd)

TEMP °C	RATE OF PRECIPITATION (g/dm^2/h)																										
	26 to 27	27 to 28	28 to 29	29 to 30	30 to 31	31 to 32	32 to 33	33 to 34	34 to 35	35 to 36	36 to 37	37 to 38	38 to 39	39 to 40	40 to 41	41 to 42	42 to 43	43 to 44	44 to 45	45 to 46	46 to 47	47 to 48	48 to 49	49 to 50	50 to 51	51 to 52	52 to 53
above 0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
0 to -1	0.3%	0.0%	0.1%	0.0%	0.1%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-1 to -2	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-2 to -3	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-3 to -4	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-4 to -5	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-5 to -6	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-6 to -7	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-7 to -8	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-8 to -9	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-9 to -10	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-10 to -11	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-11 to -12	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-12 to -13	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-13 to -14	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-14 to -15	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-15 to -16	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-16 to -17	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-17 to -18	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-18 to -19	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-19 to -20	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-20 to -21	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-21 to -22	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-22 to -23	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-23 to -24	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-24 to -25	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
TOTAL	0.3%	0.0%	0.1%	0.0%	0.1%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
CUMULATIVE	99.4%	99.4%	99.5%	99.5%	99.5%	99.5%	99.5%	99.7%	99.7%	99.7%	99.7%	99.7%	99.7%	99.9%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table E3: Probability (%) of Ice Pellets Mixed with Freezing Rain/Drizzle Occurrences – 2006-07 to 2014-15 (cont'd)

TEMP °C	RATE OF PRECIPITATION (g/dm²/h)																								
	53 to 54	54 to 55	55 to 56	56 to 57	57 to 58	58 to 59	59 to 60	60 to 61	61 to 62	62 to 63	63 to 64	64 to 65	65 to 66	66 to 67	67 to 68	68 to 69	69 to 70	70 to 71	71 to 72	72 to 73	73 to 74	74 to 75	>75	TOTAL	CUMULATIVE
above 0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**5.8%**	**5.8%**
0 to -1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**31.2%**	**36.9%**
-1 to -2	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**19.0%**	**55.9%**
-2 to -3	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**15.2%**	**71.1%**
-3 to -4	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**8.9%**	**80.1%**
-4 to -5	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**14.8%**	**94.9%**
-5 to -6	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**2.0%**	**96.9%**
-6 to -7	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**3.1%**	**100.0%**
-7 to -8	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-8 to -9	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-9 to -10	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-10 to -11	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-11 to -12	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-12 to -13	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-13 to -14	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-14 to -15	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-15 to -16	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-16 to -17	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-17 to -18	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-18 to -19	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-19 to -20	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-20 to -21	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-21 to -22	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-22 to -23	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-23 to -24	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-24 to -25	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
TOTAL	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**		
CUMULATIVE	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%		

Table E4: Probability (%) of Ice Pellets Mixed with Rain Occurrences – 2006-07 to 2014-15

TEMP °C	RATE OF PRECIPITATION (g/dm²/h)																									
	0 to 1	1 to 2	2 to 3	3 to 4	4 to 5	5 to 6	6 to 7	7 to 8	8 to 9	9 to 10	10 to 11	11 to 12	12 to 13	13 to 14	14 to 15	15 to 16	16 to 17	17 to 18	18 to 19	19 to 20	20 to 21	21 to 22	22 to 23	23 to 24	24 to 25	25 to 26
above 0	5.9%	8.9%	2.3%	2.3%	2.7%	2.0%	1.6%	1.0%	1.2%	1.0%	1.7%	0.4%	1.0%	1.5%	1.6%	1.4%	1.3%	1.2%	2.6%	2.9%	1.3%	1.4%	1.7%	1.6%	2.7%	0.1%
0 to -1	0.1%	2.1%	1.4%	0.1%	0.6%	0.8%	0.3%	0.1%	0.2%	0.1%	0.1%	0.2%	0.1%	0.6%	0.3%	0.2%	0.1%	0.1%	0.5%	0.3%	0.3%	0.3%	0.2%	0.1%	0.1%	0.0%
-1 to -2	0.0%	0.2%	2.2%	0.0%	0.0%	0.1%	0.4%	0.4%	0.5%	0.0%	0.2%	0.2%	0.2%	0.1%	0.1%	0.2%	0.3%	0.4%	0.3%	0.4%	0.5%	0.3%	0.4%	0.0%	0.0%	0.0%
-2 to -3	0.0%	0.1%	1.2%	0.0%	0.0%	0.0%	0.2%	0.2%	0.3%	0.0%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.2%	0.2%	0.2%	0.2%	0.3%	0.2%	0.2%	0.0%	0.0%	0.0%
-3 to -4	0.0%	1.4%	1.6%	0.9%	0.1%	0.0%	0.1%	0.2%	0.1%	0.1%	0.1%	0.1%	0.3%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%
-4 to -5	1.4%	0.0%	0.1%	0.0%	0.0%	0.1%	0.0%	0.1%	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-5 to -6	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-6 to -7	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-7 to -8	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-8 to -9	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-9 to -10	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-10 to -11	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-11 to -12	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-12 to -13	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-13 to -14	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-14 to -15	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-15 to -16	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-16 to -17	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-17 to -18	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-18 to -19	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-19 to -20	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-20 to -21	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-21 to -22	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-22 to -23	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-23 to -24	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-24 to -25	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
TOTAL	**7.3%**	**12.9%**	**8.8%**	**3.3%**	**3.4%**	**3.0%**	**2.6%**	**1.9%**	**2.3%**	**1.2%**	**2.3%**	**1.1%**	**1.8%**	**2.3%**	**2.0%**	**1.8%**	**2.0%**	**2.0%**	**3.5%**	**3.9%**	**2.4%**	**2.2%**	**2.4%**	**1.7%**	**2.8%**	**0.1%**
CUMULATIVE	**7.3%**	**20.2%**	**29.0%**	**32.3%**	**35.7%**	**38.7%**	**41.3%**	**43.3%**	**45.5%**	**46.7%**	**49.0%**	**50.1%**	**51.9%**	**54.3%**	**56.3%**	**58.1%**	**60.1%**	**62.1%**	**65.7%**	**69.6%**	**72.0%**	**74.2%**	**76.6%**	**78.4%**	**81.2%**	**81.2%**

Table E4: Probability (%) of Ice Pellets Mixed with Rain Occurrences – 2006-07 to 2014-15 (cont'd)

TEMP °C	RATE OF PRECIPITATION (g/dm²/h)																											
	26 to 27	27 to 28	28 to 29	29 to 30	30 to 31	31 to 32	32 to 33	33 to 34	34 to 35	35 to 36	36 to 37	37 to 38	38 to 39	39 to 40	40 to 41	41 to 42	42 to 43	43 to 44	44 to 45	45 to 46	46 to 47	47 to 48	48 to 49	49 to 50	50 to 51	51 to 52	52 to 53
above 0	2.2%	0.4%	0.5%	0.9%	1.6%	0.4%	0.5%	0.9%	0.1%	1.0%	0.7%	0.2%	0.2%	1.4%	0.9%	0.1%	0.0%	0.6%	1.1%	0.1%	0.2%	0.0%	0.0%	0.6%	0.1%	0.0%	0.0%
0 to -1	0.1%	0.0%	0.1%	0.0%	0.1%	0.1%	0.1%	0.0%	0.1%	0.2%	0.1%	0.1%	0.1%	0.1%	0.2%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.1%	0.0%
-1 to -2	0.0%	0.1%	0.0%	0.1%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-2 to -3	0.0%	0.0%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-3 to -4	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-4 to -5	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-5 to -6	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-6 to -7	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-7 to -8	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-8 to -9	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-9 to -10	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-10 to -11	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-11 to -12	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-12 to -13	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-13 to -14	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-14 to -15	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-15 to -16	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-16 to -17	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-17 to -18	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-18 to -19	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-19 to -20	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-20 to -21	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-21 to -22	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-22 to -23	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-23 to -24	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-24 to -25	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
TOTAL	**2.3%**	**0.5%**	**0.6%**	**1.1%**	**2.0%**	**0.4%**	**0.6%**	**0.9%**	**0.2%**	**1.2%**	**0.9%**	**0.6%**	**0.3%**	**1.5%**	**1.1%**	**0.1%**	**0.0%**	**0.7%**	**1.1%**	**0.1%**	**0.2%**	**0.0%**	**0.0%**	**0.8%**	**0.1%**	**0.1%**	**0.0%**
CUMULATIVE	**83.5%**	**84.0%**	**84.6%**	**85.6%**	**87.6%**	**88.0%**	**88.7%**	**89.5%**	**89.7%**	**90.9%**	**91.9%**	**92.4%**	**92.7%**	**94.2%**	**95.2%**	**95.4%**	**95.4%**	**96.1%**	**97.2%**	**97.2%**	**97.4%**	**97.4%**	**97.4%**	**98.2%**	**98.2%**	**98.3%**	**98.3%**

Table E4: Probability (%) of Ice Pellets Mixed With Rain Occurrences – 2006-07 to 2014-15 (cont'd)

TEMP °C	RATE OF PRECIPITATION (g/dm²/h)																								
	53 to 54	54 to 55	55 to 56	56 to 57	57 to 58	58 to 59	59 to 60	60 to 61	61 to 62	62 to 63	63 to 64	64 to 65	65 to 66	66 to 67	67 to 68	68 to 69	69 to 70	70 to 71	71 to 72	72 to 73	73 to 74	74 to 75	>75	Total	Cumulative
above 0	0.1%	0.1%	0.1%	0.0%	0.0%	0.0%	0.2%	0.4%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.4%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	**69.6%**	**69.6%**
0 to -1	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**10.7%**	**80.3%**
-1 to -2	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**8.3%**	**88.6%**
-2 to -3	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**4.4%**	**93.0%**
-3 to -4	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**5.1%**	**98.1%**
-4 to -5	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**1.9%**	**100.0%**
-5 to -6	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-6 to -7	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-7 to -8	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-8 to -9	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-9 to -10	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-10 to -11	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-11 to -12	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-12 to -13	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-13 to -14	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-14 to -15	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-15 to -16	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-16 to -17	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-17 to -18	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-18 to -19	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-19 to -20	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-20 to -21	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-21 to -22	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-22 to -23	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-23 to -24	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-24 to -25	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
TOTAL	**0.1%**	**0.1%**	**0.2%**	**0.0%**	**0.0%**	**0.0%**	**0.3%**	**0.4%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.1%**	**0.0%**	**0.0%**	**0.0%**	**0.4%**	**0.1%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**		
CUMULATIVE	**98.4%**	**98.5%**	**98.7%**	**98.7%**	**98.7%**	**98.7%**	**99.0%**	**99.4%**	**99.4%**	**99.4%**	**99.4%**	**99.4%**	**99.5%**	**99.5%**	**99.5%**	**99.5%**	**99.9%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**		

Table E5: Probability (%) of Ice Pellets Mixed With Snow Occurrences – 2006-07 to 2014-15

TEMP °C	RATE OF PRECIPITATION (g/dm²/h)																								
	0 to 1	1 to 2	2 to 3	3 to 4	4 to 5	5 to 6	6 to 7	7 to 8	8 to 9	9 to 10	10 to 11	11 to 12	12 to 13	13 to 14	14 to 15	15 to 16	16 to 17	17 to 18	18 to 19	19 to 20	20 to 21	21 to 22	22 to 23	23 to 24	24 to 25	25 to 26
above 0	3.7%	0.7%	1.0%	1.0%	0.8%	0.3%	0.1%	0.2%	0.2%	0.1%	0.2%	0.3%	0.3%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.2%	0.3%	0.0%
0 to -1	1.7%	1.7%	1.1%	1.5%	1.3%	1.1%	1.3%	0.6%	1.0%	0.5%	0.1%	0.2%	0.1%	0.1%	0.0%	0.0%	0.0%	0.1%	0.0%	0.1%	0.1%	0.1%	0.0%	0.0%	0.1%	0.0%
-1 to -2	1.9%	4.7%	1.0%	1.7%	3.1%	1.6%	1.5%	0.7%	0.8%	0.8%	1.0%	0.6%	0.7%	0.5%	0.4%	0.2%	0.1%	0.1%	0.2%	0.3%	0.1%	0.1%	0.1%	0.0%	0.0%	0.0%
-2 to -3	2.7%	1.9%	0.5%	0.5%	0.5%	0.4%	1.1%	0.4%	0.3%	0.3%	0.4%	0.2%	0.3%	0.4%	0.9%	0.6%	0.6%	0.6%	0.4%	0.2%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%
-3 to -4	1.5%	1.8%	0.3%	1.0%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.2%	0.3%	0.1%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%
-4 to -5	1.9%	1.4%	0.1%	0.7%	0.5%	0.3%	0.5%	0.1%	0.3%	0.1%	0.1%	0.0%	0.1%	0.4%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-5 to -6	0.0%	0.0%	0.0%	0.2%	1.0%	0.1%	0.6%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.4%	0.1%	0.2%	0.1%	0.2%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.0%
-6 to -7	1.7%	0.1%	0.9%	0.8%	0.2%	0.3%	0.4%	0.5%	0.4%	0.1%	0.3%	0.4%	0.3%	0.3%	0.2%	0.2%	0.1%	0.2%	0.2%	0.2%	0.2%	0.2%	0.1%	0.1%	0.1%	0.0%
-7 to -8	0.0%	0.0%	0.0%	0.5%	0.3%	0.3%	0.1%	0.0%	0.1%	0.0%	0.0%	0.0%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-8 to -9	0.0%	0.0%	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-9 to -10	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-10 to -11	0.2%	0.1%	1.1%	0.2%	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-11 to -12	2.0%	3.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-12 to -13	0.5%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-13 to -14	1.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-14 to -15	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-15 to -16	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-16 to -17	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-17 to -18	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-18 to -19	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-19 to -20	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-20 to -21	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-21 to -22	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-22 to -23	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-23 to -24	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-24 to -25	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
TOTAL	**19.3%**	**16.0%**	**6.0%**	**8.4%**	**8.4%**	**4.4%**	**5.6%**	**2.7%**	**3.2%**	**2.2%**	**2.7%**	**2.3%**	**2.1%**	**2.3%**	**2.1%**	**1.2%**	**1.1%**	**1.1%**	**0.9%**	**0.9%**	**0.5%**	**0.5%**	**0.3%**	**0.4%**	**0.6%**	**0.1%**
CUMULATIVE	**19.3%**	**35.3%**	**41.3%**	**49.7%**	**58.1%**	**62.5%**	**68.2%**	**70.8%**	**74.1%**	**76.3%**	**79.0%**	**81.3%**	**83.4%**	**85.7%**	**87.7%**	**88.9%**	**90.0%**	**91.1%**	**92.0%**	**92.9%**	**93.4%**	**93.9%**	**94.2%**	**94.6%**	**95.2%**	**95.4%**

Table E5: Probability (%) of Ice Pellets Mixed With Snow Occurrences – 2006-07 to 2014-15 (cont'd)

TEMP °C	RATE OF PRECIPITATION (g/dm²/h)																											
	26 to 27	27 to 28	28 to 29	29 to 30	30 to 31	31 to 32	32 to 33	33 to 34	34 to 35	35 to 36	36 to 37	37 to 38	38 to 39	39 to 40	40 to 41	41 to 42	42 to 43	43 to 44	44 to 45	45 to 46	46 to 47	47 to 48	48 to 49	49 to 50	50 to 51	51 to 52	52 to 53
above 0	0.1%	0.0%	0.1%	0.0%	0.1%	0.1%	0.1%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
0 to -1	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-1 to -2	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-2 to -3	0.1%	0.0%	0.1%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-3 to -4	0.0%	0.0%	0.0%	0.1%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.6%	0.0%	0.0%	0.0%	0.0%
-4 to -5	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-5 to -6	0.1%	0.0%	0.0%	0.0%	0.1%	0.1%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-6 to -7	0.1%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-7 to -8	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-8 to -9	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-9 to -10	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-10 to -11	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-11 to -12	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-12 to -13	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-13 to -14	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-14 to -15	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-15 to -16	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-16 to -17	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-17 to -18	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-18 to -19	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-19 to -20	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-20 to -21	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-21 to -22	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-22 to -23	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-23 to -24	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
-24 to -25	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
TOTAL	**0.6%**	**0.0%**	**0.2%**	**0.2%**	**0.6%**	**0.2%**	**0.1%**	**0.2%**	**0.1%**	**0.1%**	**0.1%**	**0.0%**	**0.0%**	**0.3%**	**0.1%**	**0.0%**	**0.0%**	**0.1%**	**0.2%**	**0.1%**	**0.0%**	**0.0%**	**0.0%**	**0.6%**	**0.0%**	**0.0%**	**0.0%**
CUMULATIVE	**95.9%**	**95.9%**	**96.1%**	**96.3%**	**96.9%**	**97.1%**	**97.2%**	**97.4%**	**97.5%**	**97.6%**	**97.7%**	**97.7%**	**97.7%**	**98.0%**	**98.1%**	**98.1%**	**98.1%**	**98.1%**	**98.3%**	**98.4%**	**98.4%**	**98.4%**	**98.4%**	**99.0%**	**99.0%**	**99.0%**	**99.0%**

Table E5 (cont'd): Probability (%) of Ice Pellets Mixed With Snow Occurrences – 2006-07 to 2014-15

TEMP °C	RATE OF PRECIPITATION (g/dm²/h)																								
	53 to 54	54 to 55	55 to 56	56 to 57	57 to 58	58 to 59	59 to 60	60 to 61	61 to 62	62 to 63	63 to 64	64 to 65	65 to 66	66 to 67	67 to 68	68 to 69	69 to 70	70 to 71	71 to 72	72 to 73	73 to 74	74 to 75	>75	Total	Cumulative
above 0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**10.4%**	**10.4%**
0 to -1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**13.1%**	**23.5%**
-1 to -2	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**22.6%**	**46.1%**
-2 to -3	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**13.7%**	**59.8%**
-3 to -4	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%	**8.0%**	**67.8%**
-4 to -5	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**6.8%**	**74.6%**
-5 to -6	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**3.9%**	**78.5%**
-6 to -7	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**8.8%**	**87.3%**
-7 to -8	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**1.8%**	**89.1%**
-8 to -9	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.3%**	**89.4%**
-9 to -10	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**89.4%**
-10 to -11	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**2.3%**	**91.7%**
-11 to -12	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**6.1%**	**97.8%**
-12 to -13	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.7%**	**98.5%**
-13 to -14	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**1.5%**	**100.0%**
-14 to -15	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-15 to -16	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-16 to -17	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-17 to -18	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-18 to -19	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-19 to -20	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-20 to -21	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-21 to -22	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-22 to -23	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-23 to -24	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
-24 to -25	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	**0.0%**	**100.0%**
TOTAL	**0.0%**	**0.0%**	**0.1%**	**0.0%**	**0.0%**	**0.0%**	**0.1%**	**0.2%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.1%**	**0.0%**	**0.0%**	**0.0%**	**0.2%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.3%**		
CUMULATIVE	**99.0%**	**99.0%**	**99.1%**	**99.1%**	**99.1%**	**99.1%**	**99.3%**	**99.4%**	**99.4%**	**99.4%**	**99.4%**	**99.4%**	**99.5%**	**99.5%**	**99.5%**	**99.5%**	**99.7%**	**99.7%**	**99.7%**	**99.7%**	**99.7%**	**99.7%**	**100.0%**		

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