

“Severe Icing: Urgent PIREP!”

{ Severe Icing Across the United States from 2002 – 2010:
Relationship to Icing Type, Terrain, Altitude, Aircraft Type &
Climate



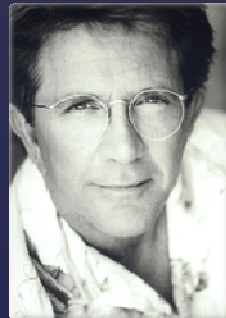
Elizabeth J. Austin, Ph.D., C.C.M.



Patrick B. Williams, MFA



Stephen N. Goates



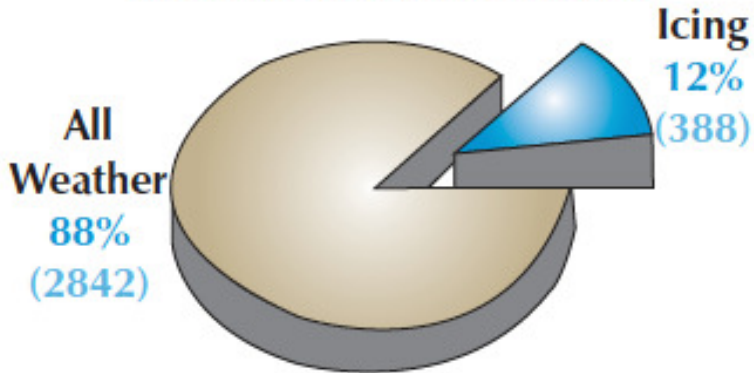
Alan Austin

WeatherExtreme Ltd.

The Stats:

1990-2000 27% (105 accidents) involved fatalities

Total Weather Accidents

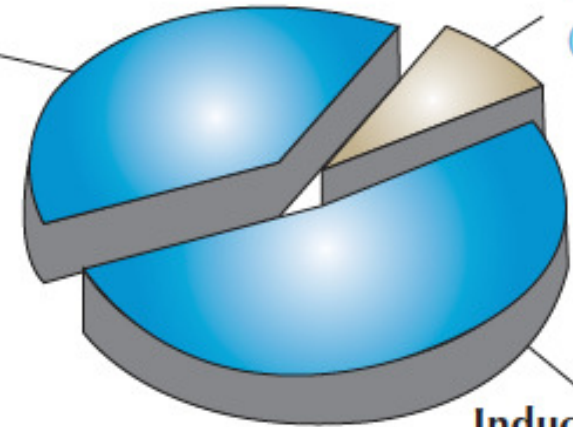


Structural

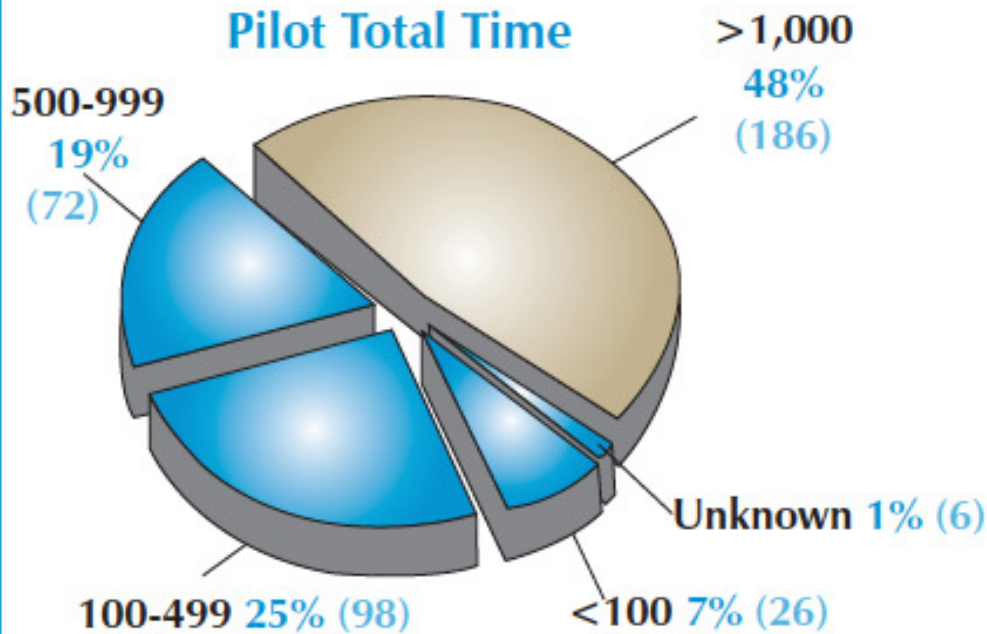
Icing
40%
(153)

Leading Factors

Ground Accumulation
8%
(32)



Pilot Total Time

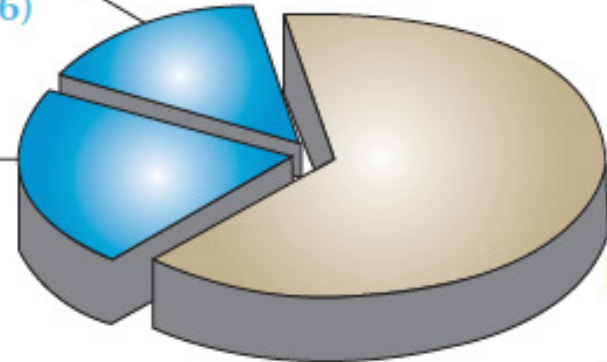


Aircraft Type

Multi
14%
(56)

Induction Icing
52%
(203)

Retract
Single
22%
(83)



Fixed-gear
Single
64%
(249)

Source: AOPA Air Safety Foundation accident database

RMG UA /OV RMG /TM 1705 /FL045 /TP P28A /WX FV10SM /TA 17
/TB MOD /RM DIFFICULT TO DRINK COFFEE

SUN UUA /OV HLE/TM 2107/FL120/TP SW3/SK IMC/IC SVR/RM ACFT ENCOUNTERED SVR ICING
CAUSING BOTH ENGINES TO STOP, ABLE TO RESTART

BOI UA /OV BOI090100/TM 0135/FL065/TP P28R/TB NEG/RM PILOT SAID "IT JUSTS LOOKS FUNKY"

PRC UA /OV LRU-VGT/ TM1630/ FL220/ TP MU2/ RM PICKED UP A FULL LOAD OF ICE FL220-230 E
OF LAS MORE THAN GOD ALLOWS

CDC UUA /OV SLC-CDC/TM 0332/FLUNKN/TP E120/TB CONT MOD OCNL SEV BLO FL260/RM HAD
SOME SCREAMERS IN THE BACK

KMHT 291653Z AUTO 34004KT 1/2SM BKN004 OVC009 06/M02 A2999 RMK VISIBILITY GETTING
PRETTY [EXPLETIVE DELETED RHYMES WITH PRETTY]

WORST DAY IN 40 YEARS OF FLYING

Sometimes remarks give more insight than the PIREP

NOAA's National Weather Service Aviation Weather Center Aviation Digital Data Service (ADDS)

Home

News

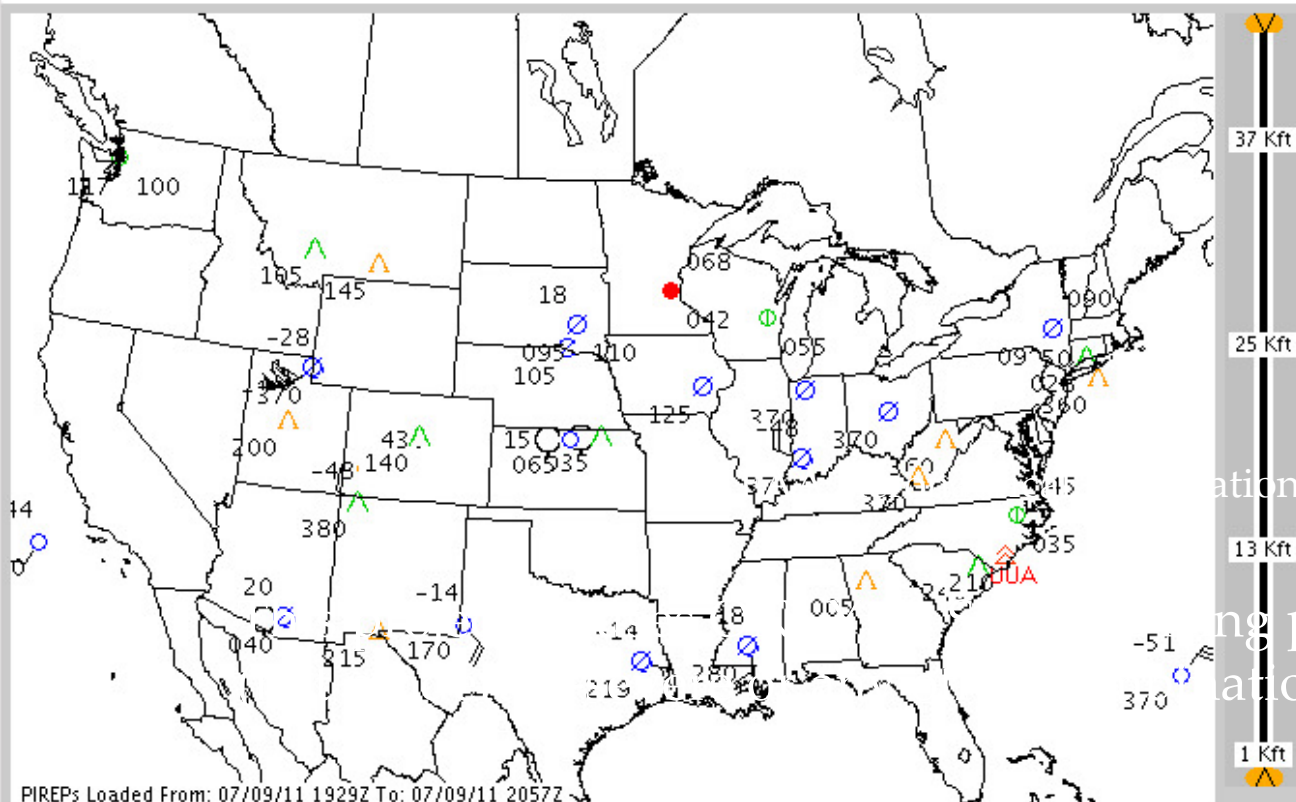
Organization

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PIREPs Java Tool



PIREPs Loaded From: 07/09/11 1929Z To: 07/09/11 2057Z

Map:

-
-
-

Misc.:

-
-
-

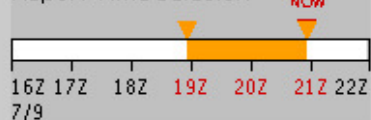
PIREPs Data:

- Icing
- Turbulence
- Sky and Weather
- All

Map Overlays:

- VORs
- ARTCC Boundaries
- Counties
- Highways
- Rivers

Report Time Selector:



PIREP Data Key

Icing

NEG	TRC	LGT	MDT	SVR	EXT

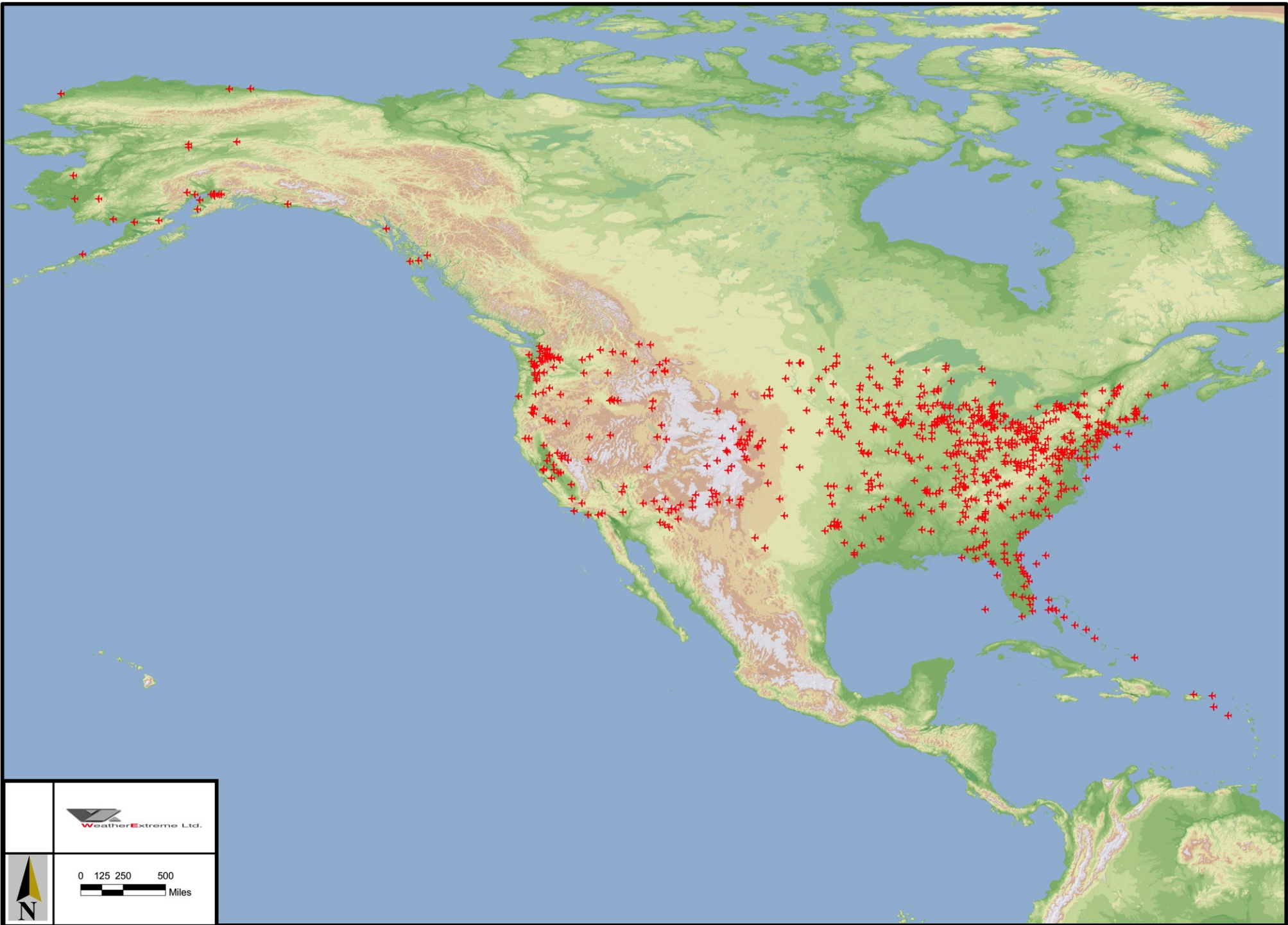
Turbulence


SMTH	LGT	MDT	SVR	EXT

Weather Conditions

UNKN	CLR	FEW	SCT	BKN	OVC	IMC

TEMP (C) Cloud Top
 Visibility (SM) WX Cloud Base
 FLIGHT LEVEL (MSL)



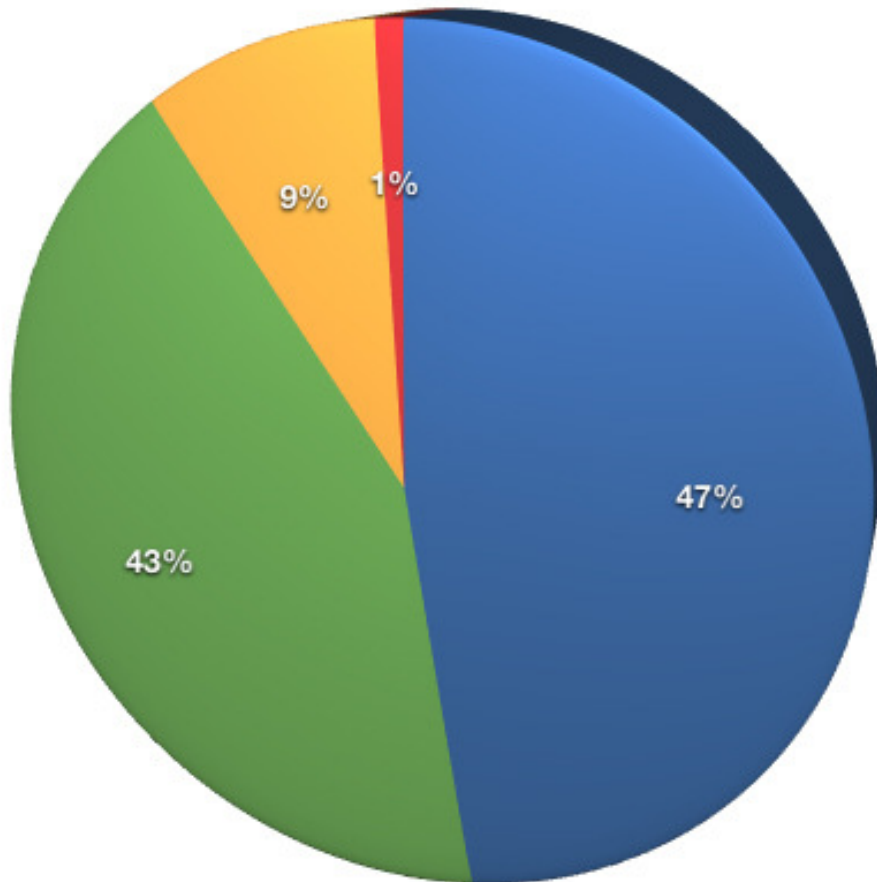
	 <p>WeatherExtreme Ltd.</p>
 <p>N</p>	<p>0 125 250 500 Miles</p> 

Pireps Movie

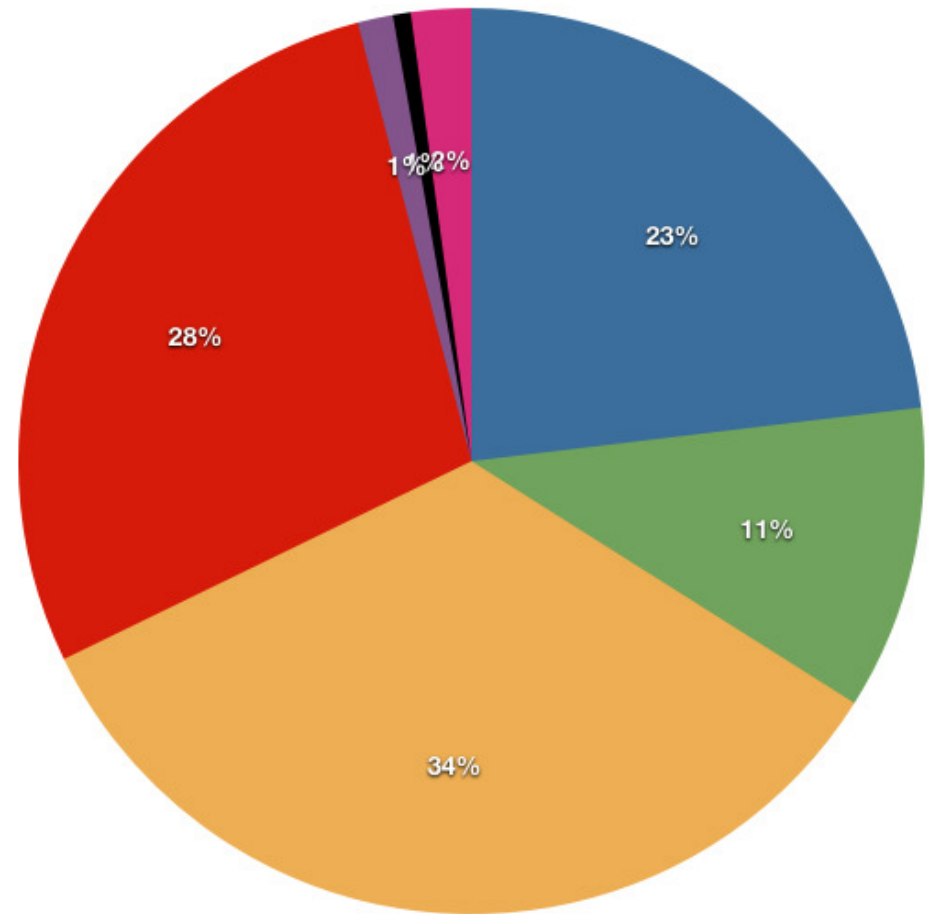
TOTALS for Severe Icing PIREPs from 2002 - 2010

Total Severe Icing PIREPS from 2002 - 2010 by Flight Altitude

- SFC-10K
- 10,001-20K
- 20,001-30K
- 30,001+

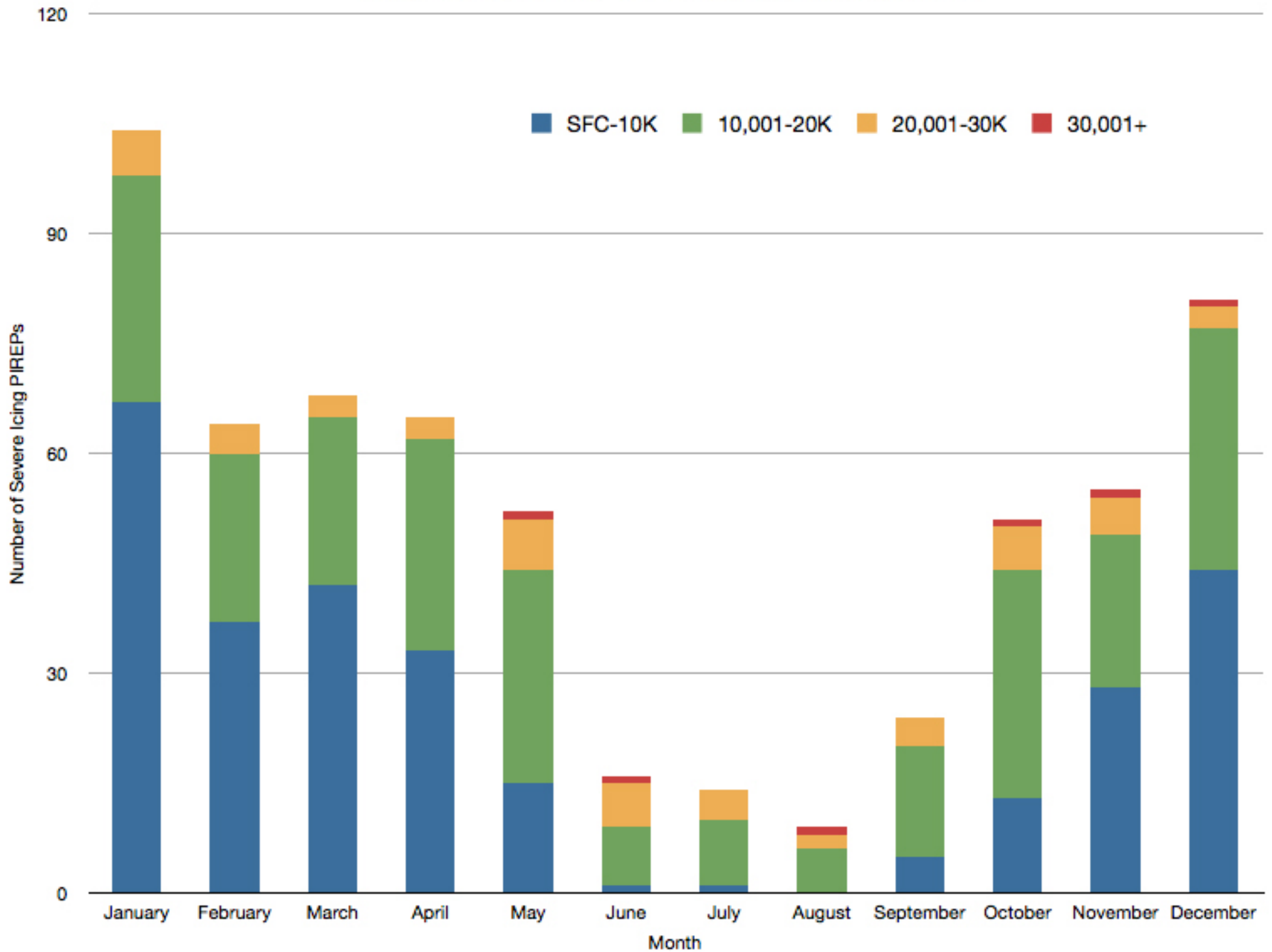


Total Severe Icing Pilot Reports from 2002 - 2010 by Aircraft Type



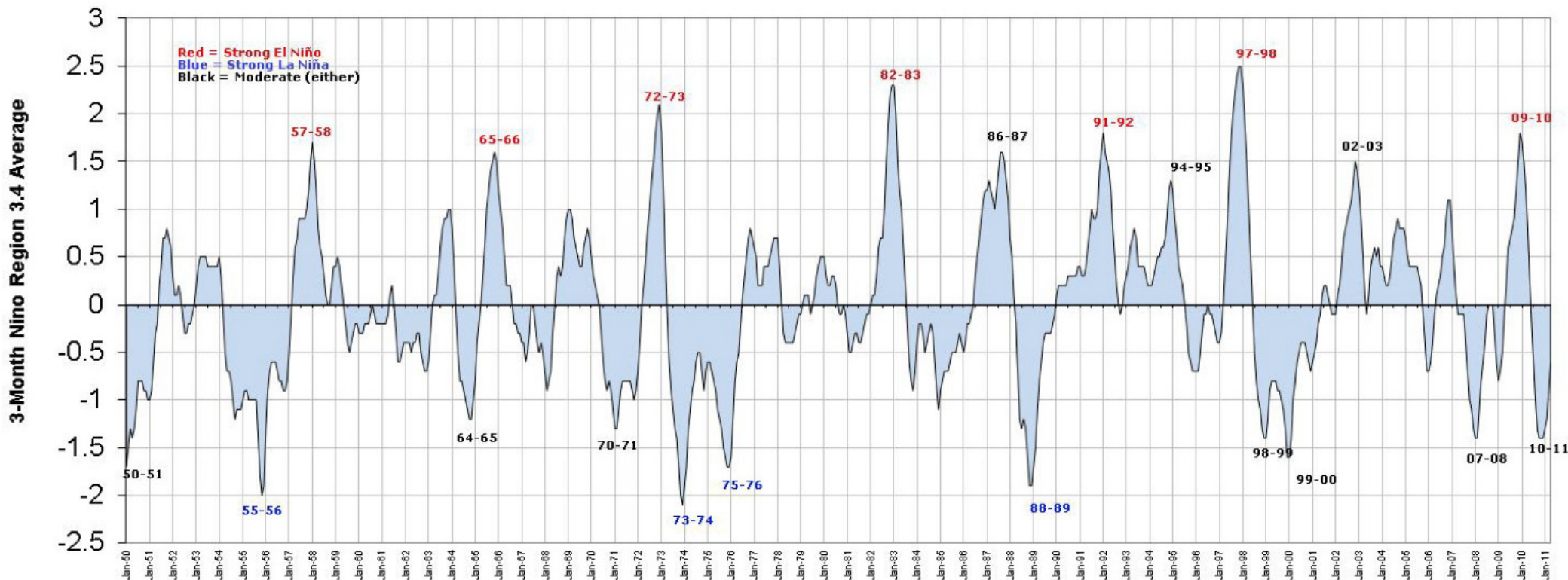
- Commercial Jet
- Small
- Turbo Prop
- Corporate Jet
- Military
- Unknown
- Helicopter

Number of Severe Icing PIREPs from 2002 - 2010 by Altitude



Oceanic Niño Index (ONI)

http://www.cpc.noaa.gov/products/analysis_monitoring/ensostuff/ens



Warm (El Niño) and cold (La Niña) episodes based on a threshold of +/- 0.5°C for ONI

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US Dept of State Geographer

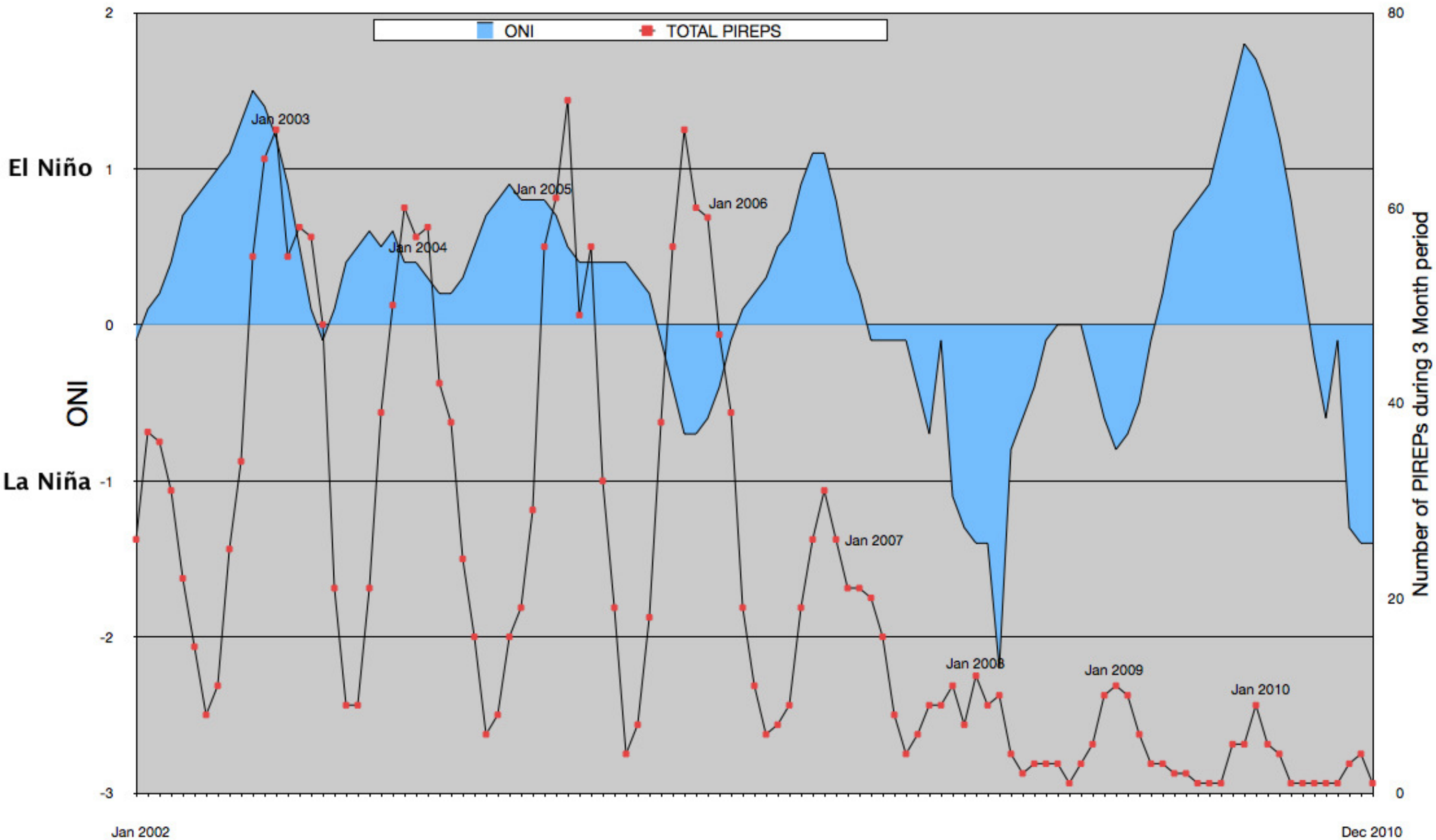
© 2011 Google
Data SIO, NOAA, U.S. Navy, NGA, GEBCO

10°25'23.62" N 142°21'57.13" W elev -16834 ft

©2010 Google

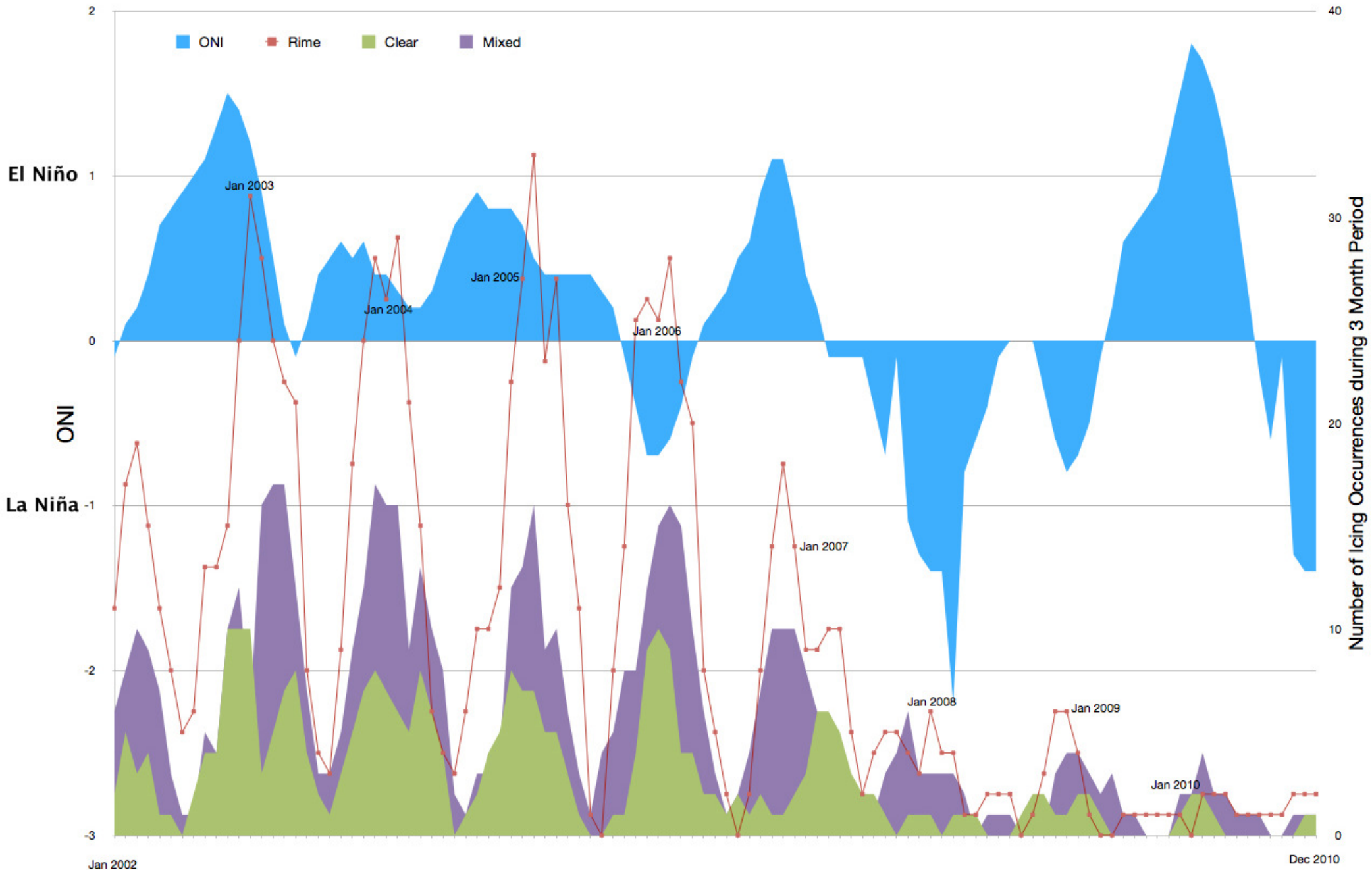
Eye alt 3897.82 mi

Severe Icing PIREPs versus Oceanic Niño Index (ONI)



PIREP Icing Type versus Oceanic Niño Index (ONI)

3 month running mean ONI and PIREP icing is plotted, e.g., DJF, JFM, FMA, MAM, etc.



Conclusions & Final Remarks

- Pilot Reports for severe icing only have decreased dramatically over the past decade (**by over 90%**)
- Severe icing PIREPs occur during most of the year **except for** the months of June – September where very few are reported
- On the surface, the number of severe icing PIREPs & the icing types seem to be loosely correlated with the ONI index, **however**, this correlation may not be in response to the ONI but rather just the 'weather' during the time of year
- The **majority of ice type is rime, followed by mixed and then clear.** However, clear ice may be underreported due to: (a) the difficulty in detecting this type of ice with eye, and (b) confusing it with mixed or rime
- The **surface up to 20,000 feet MSL accounts for 90%** of the severe icing encounters