STAR Studies

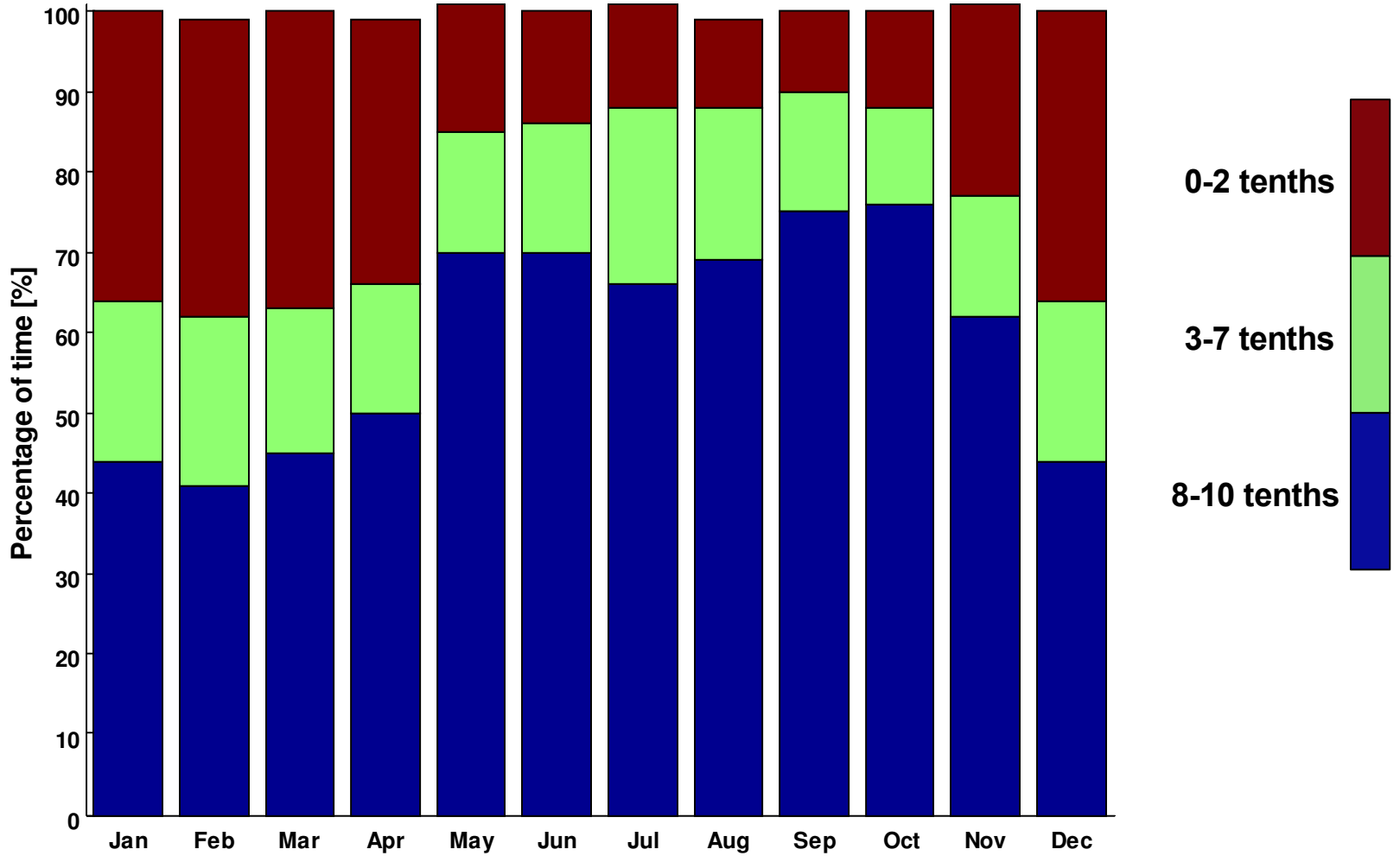
Ron Stewart

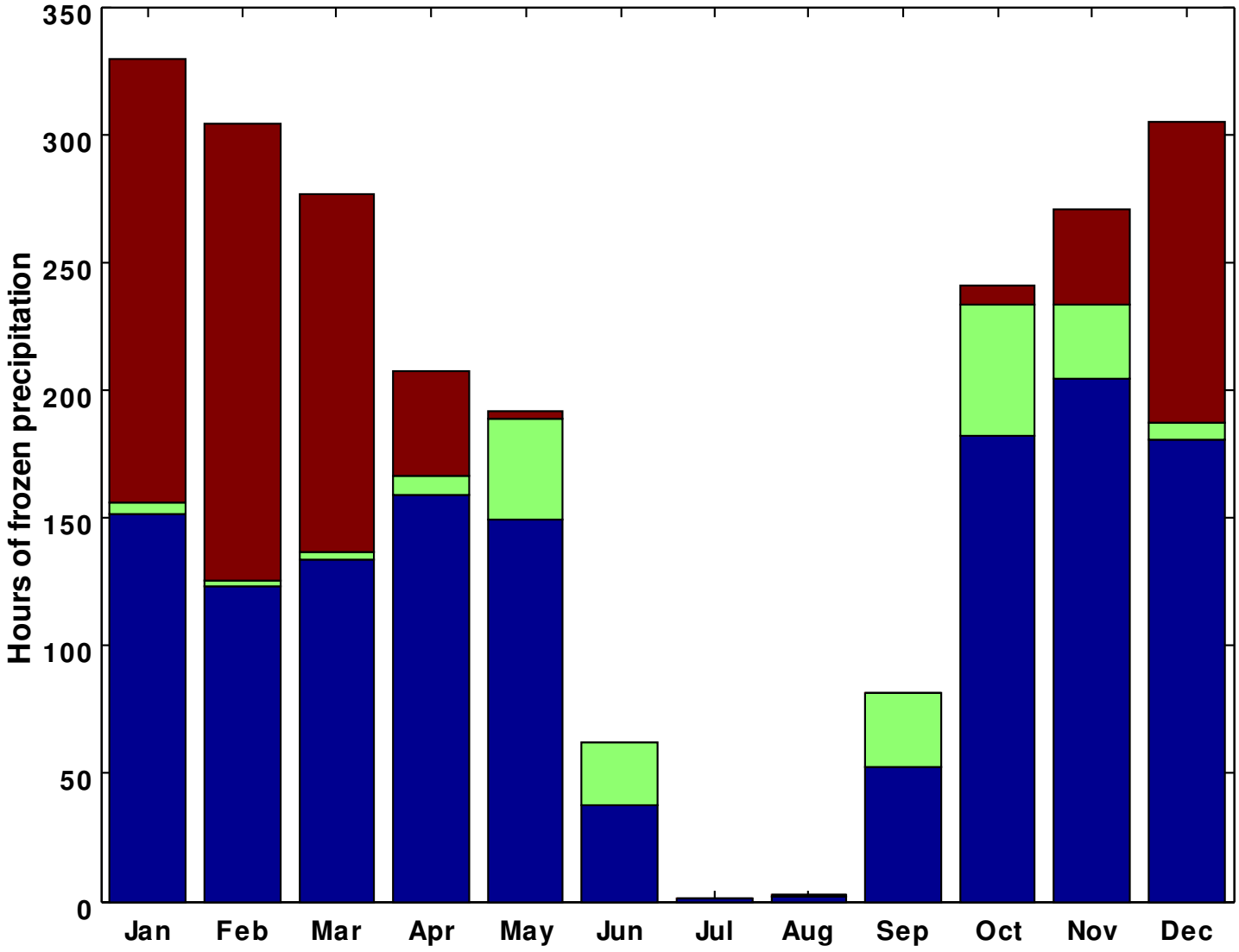
OBJECTIVES

Research will aim to:

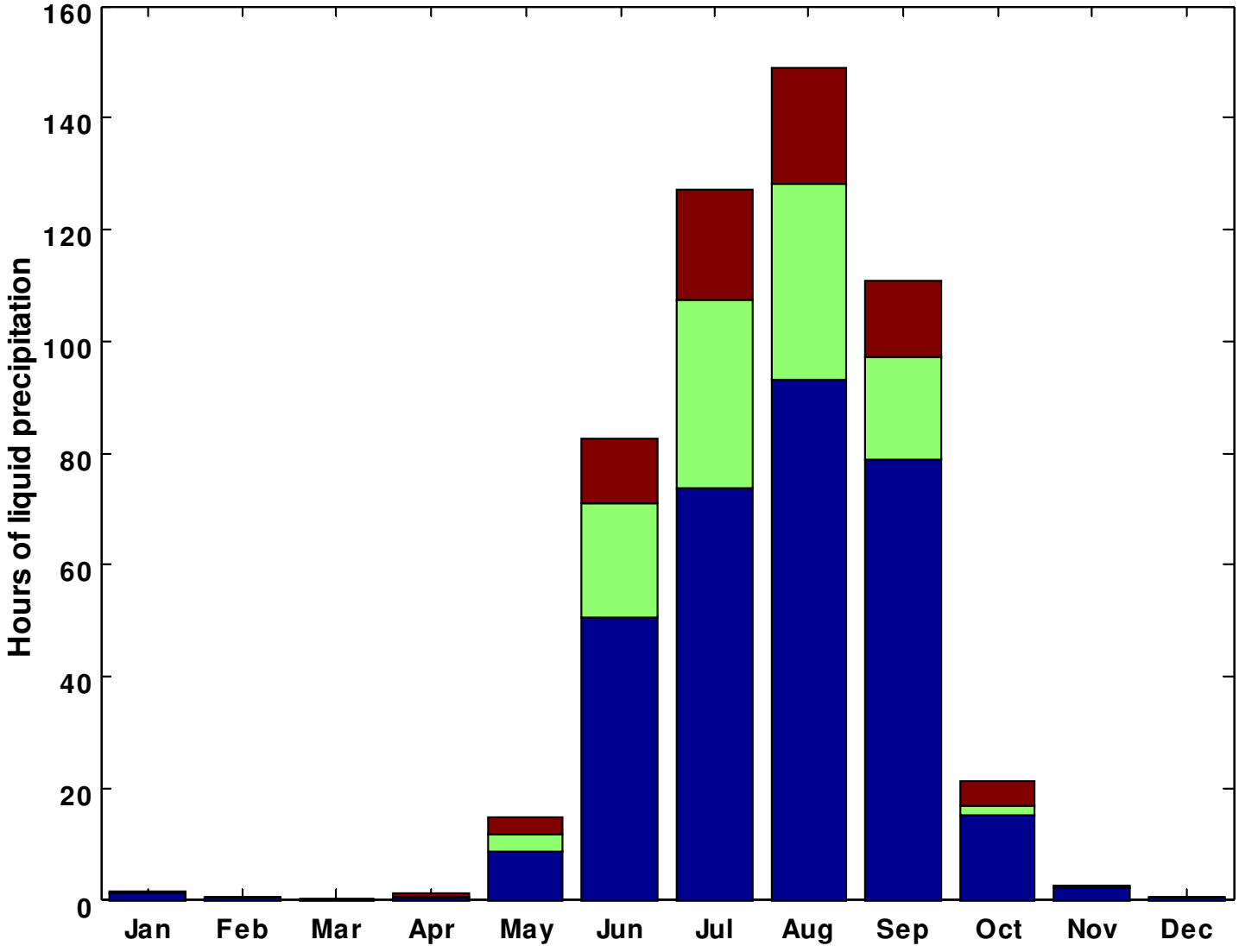
- Better understand the structure of storm systems affecting the Iqaluit and Baffin Island regions
- Better understand the conditions leading to precipitation and related weather conditions at the surface
- To exploit new observational systems
- To contribute to local community interactions

Monthly Cloud Cover at Iqaluit, Nunavut



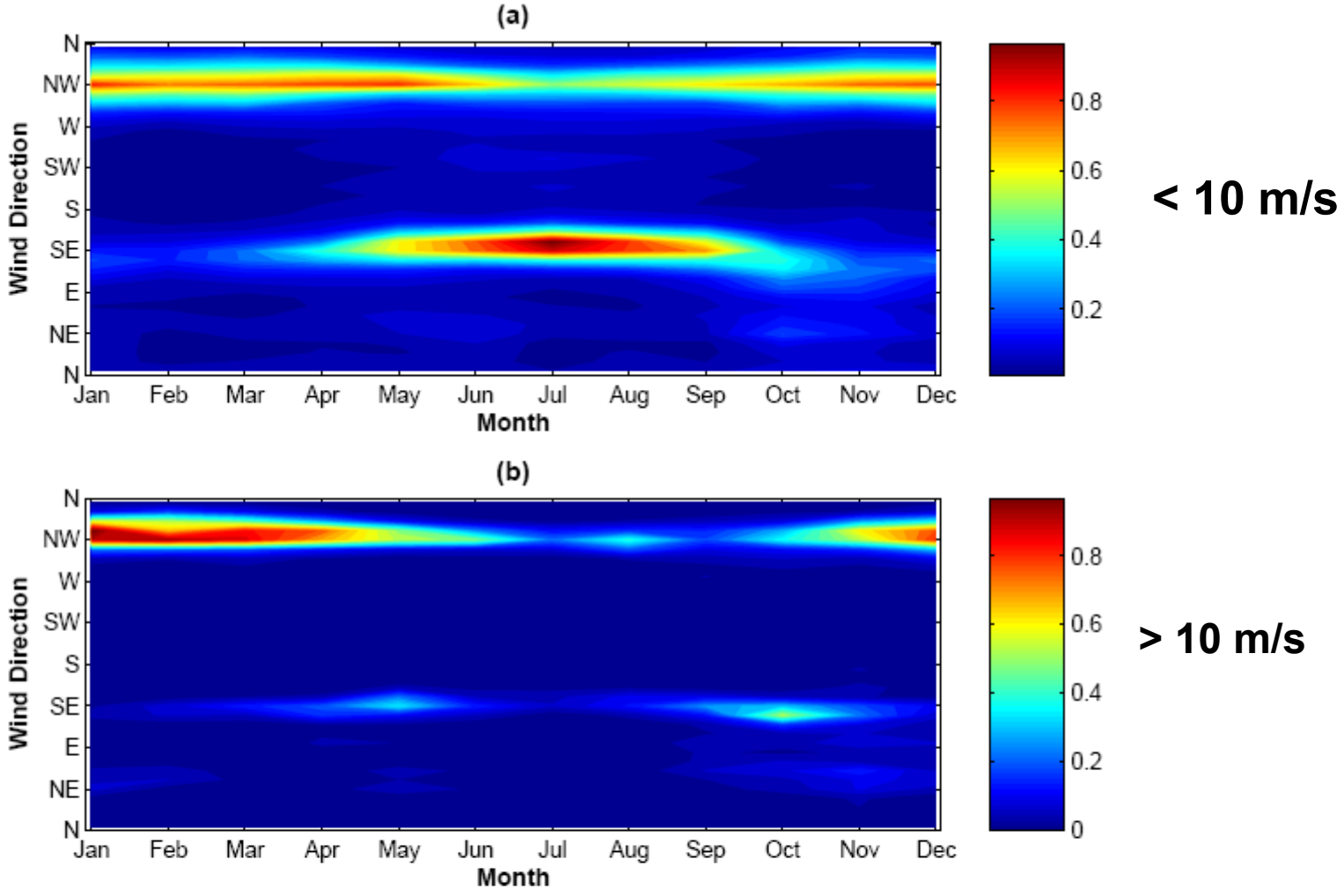


Mean monthly hours of frozen precipitation: snow (blue), snow showers (green), and ice crystals (dark red).

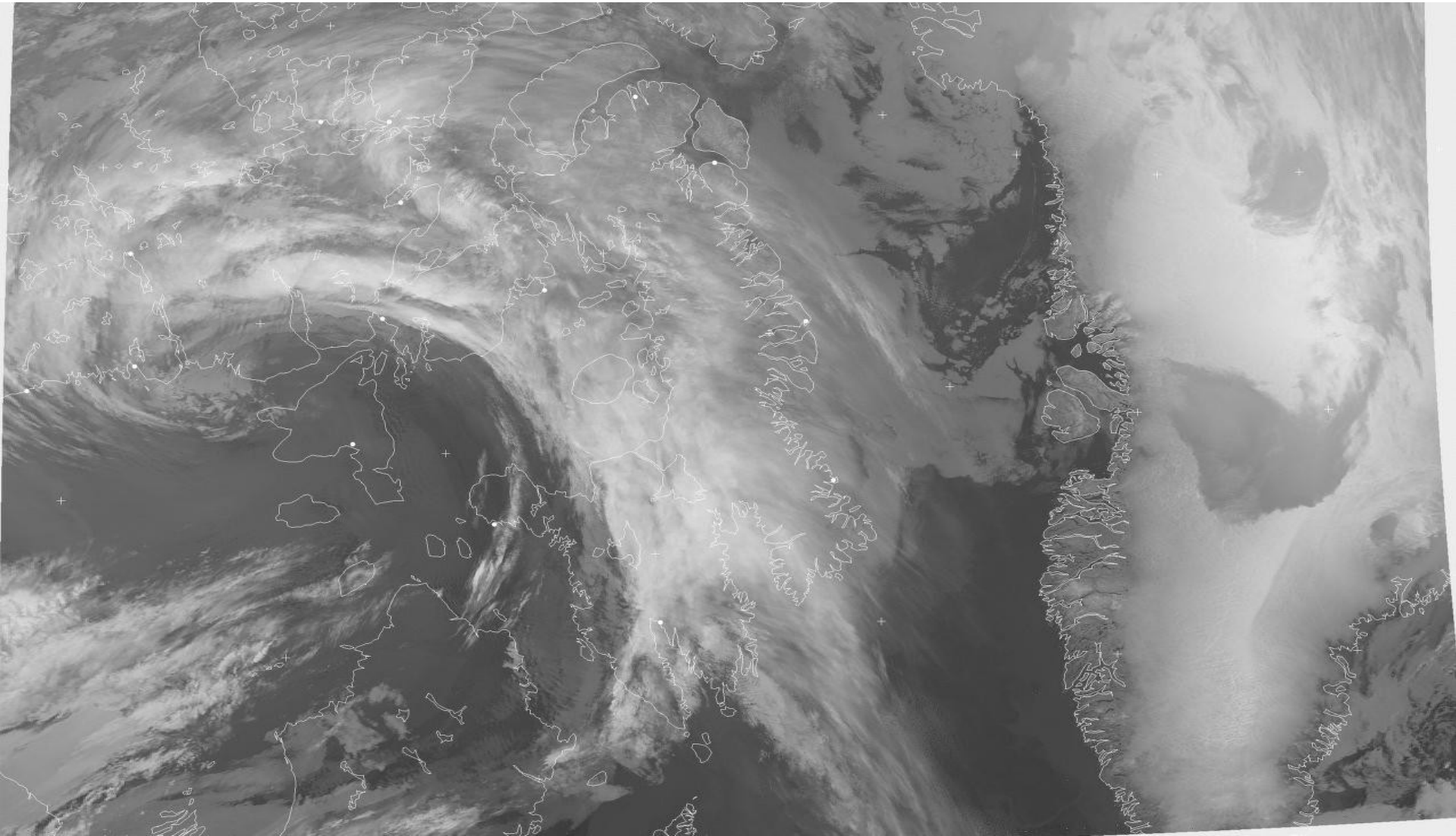


Mean monthly hours of liquid precipitation: rain (blue), rain showers (green), and drizzle (dark red).

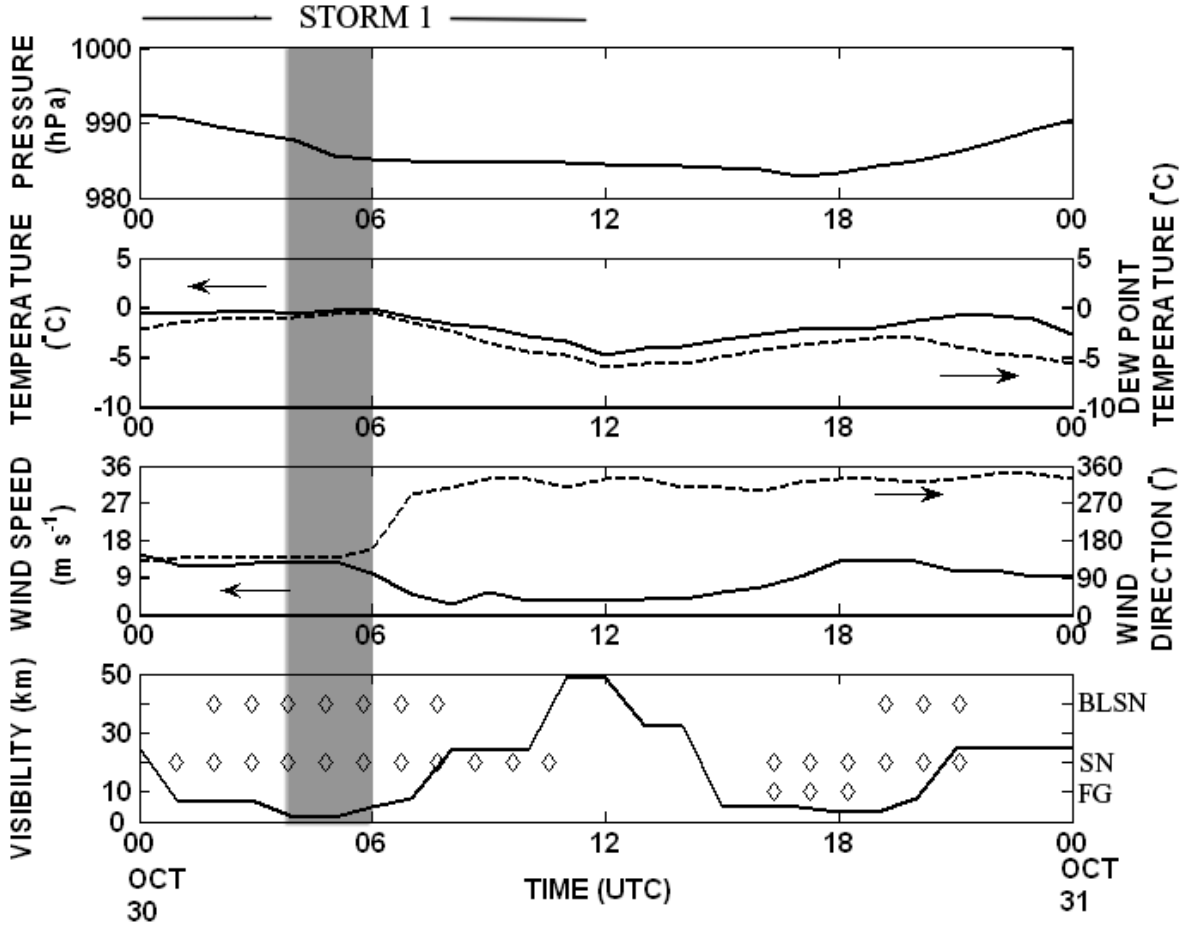
WIND DIRECTIONS AT IQALUIT



Snowstorm
October 24-25, 2004



SURFACE FEATURES
Iqaluit October 2005



TOOLS

- Observations

  Aircraft, radar, soundings, surface weather, photography …

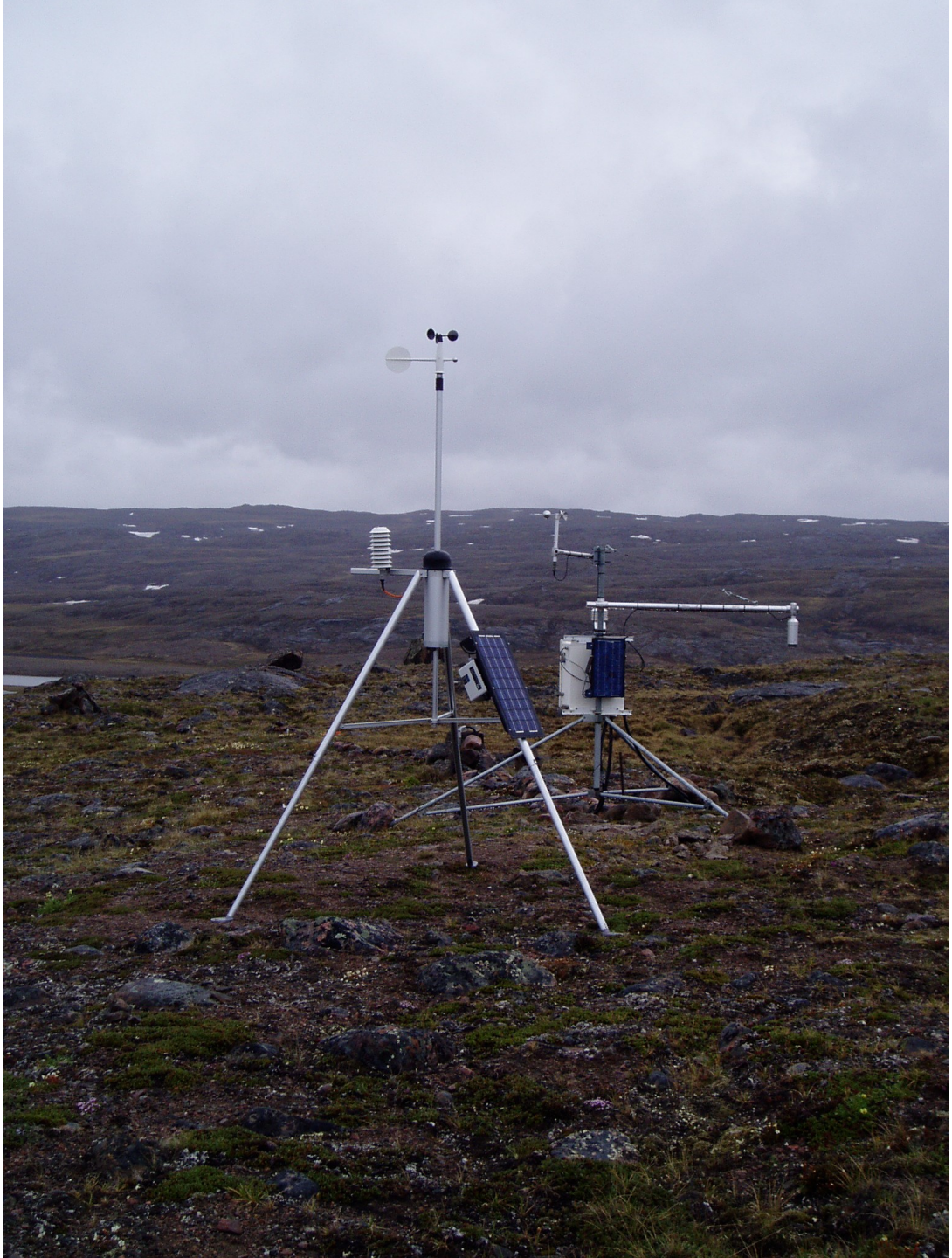
  CloudSat/MODIS/…

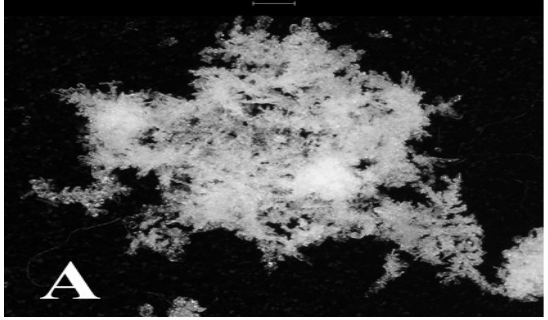
- Models

  GEM-LAM

  NARR

  …

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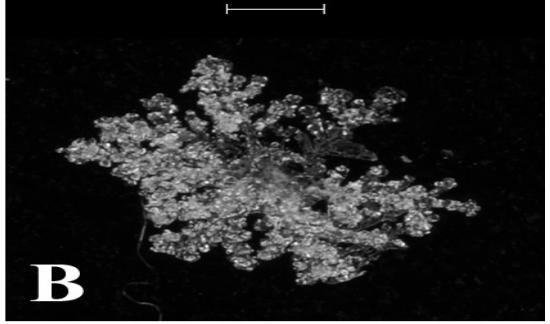
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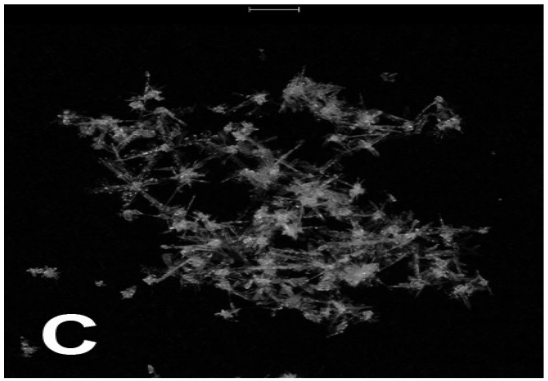
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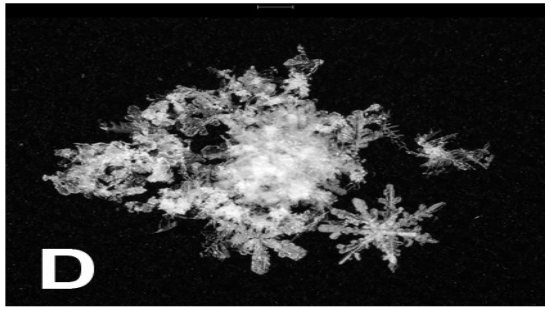
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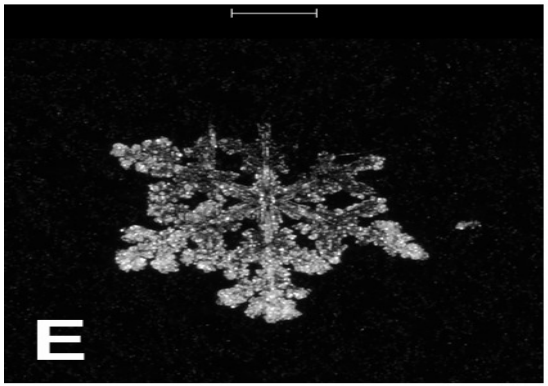
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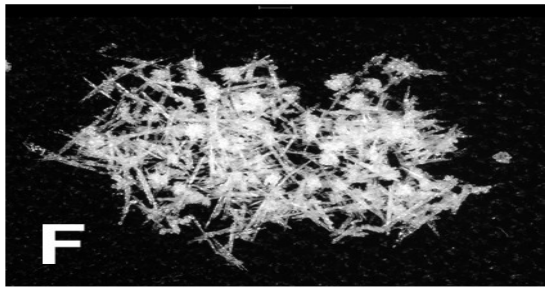
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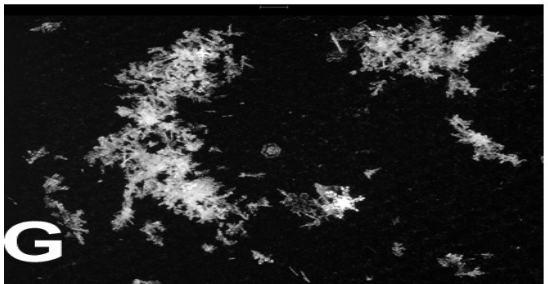
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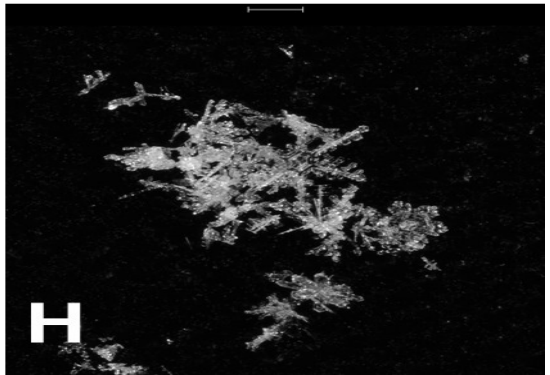
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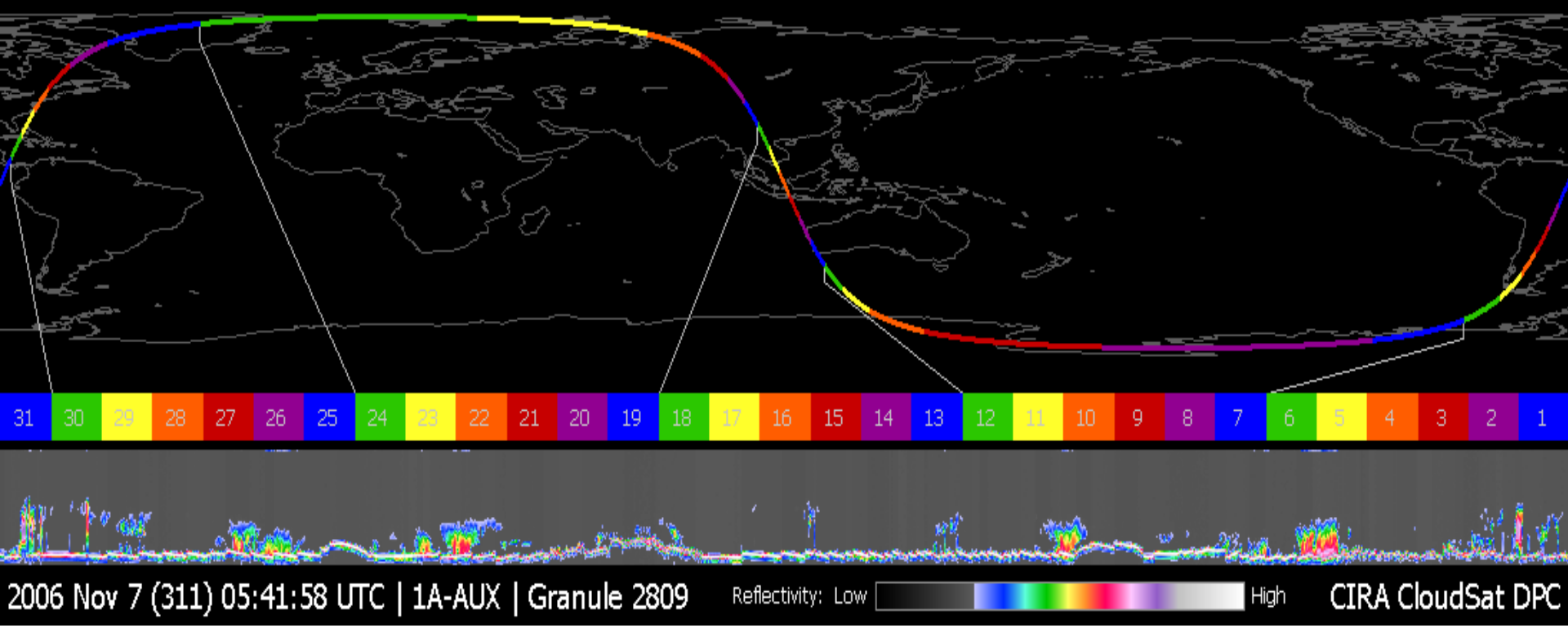
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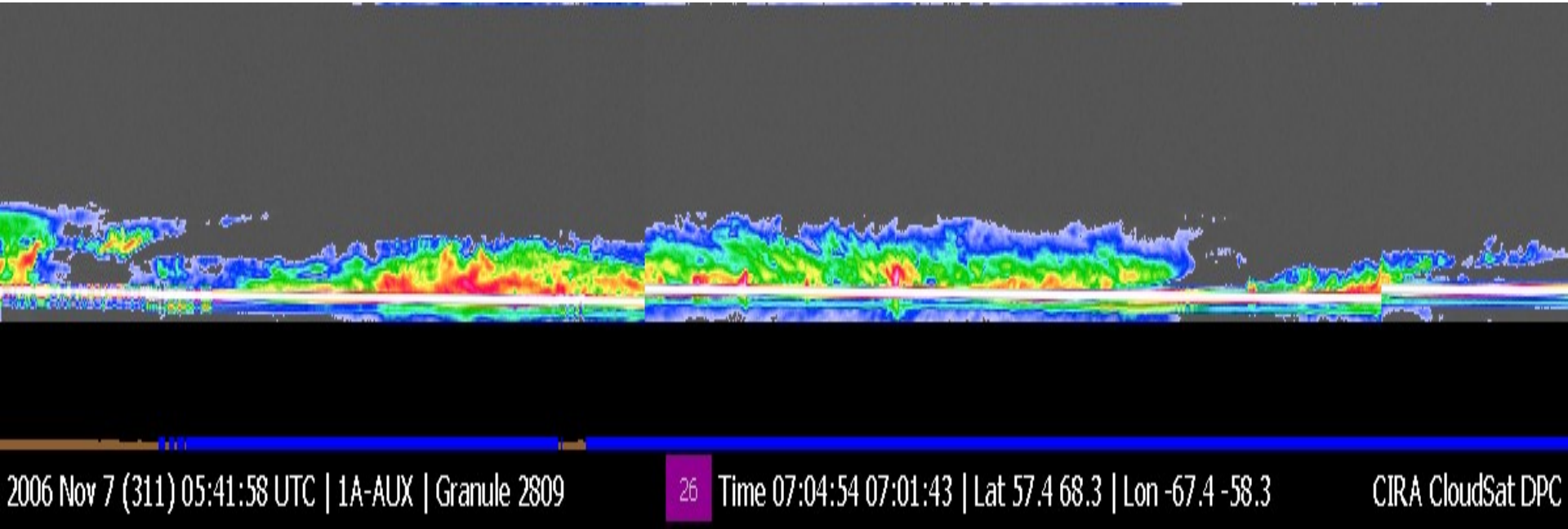
CIRA CloudSat DPC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26
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CIRA CloudSat DPC

VIRGA
November 2005, Iqaluit

Sublimating
ice crystals below
cloud are common
in the Arctic

TIMETABLE

2006

continue background studies

2007

Winter purchase equipment

Spring/summer installation

2008 …

ISSUES include

- Observational systems available?
- Detailed observational plans including flight tracks
- Data management
- Uncertainty about IPY funding
- Best ways to interact with communities

EXPECTED OUTCOMES

There will be several outcomes of this research including:

- Better understanding the evolution and structure of storms as well as their precipitation and surface weather conditions
- Exploiting satellite information
- Interacting with local communities

- This should contribute to each Theme

OBJECTIVE

To better understand severe Arctic storms, their associated hazardous conditions, and their potential change.

Three Themes:

- Physical features of Arctic storms and extreme weather events and the identification of hazards
- Processes and feedbacks leading to such extremes
- Change in such hazards under changing climatic conditions

HAZARDS AND FOCAL POINT

Main Hazards:

- Blizzards, blowing snow, severe wind chill and reduced visibility
- Storms producing snow and mixed phase precipitation with significant accumulation
- Storms, strong winds and their impact on sea ice

Main focal point:

- Iqaluit and Baffin Island

Atmospheric Sounding