Antarctic Logistics & Expeditions

Tools used by ALE Meteorology Department

Celine Nyhan
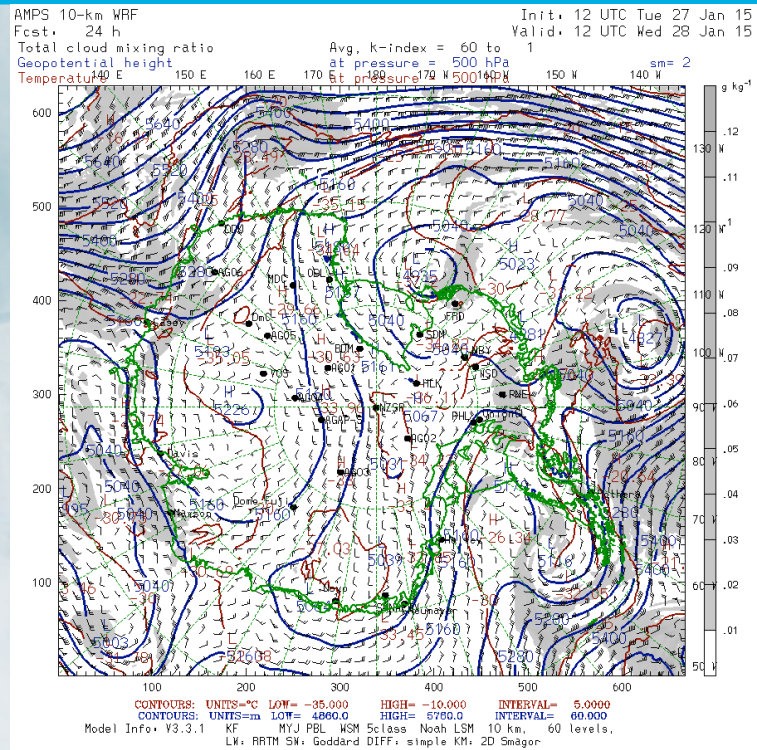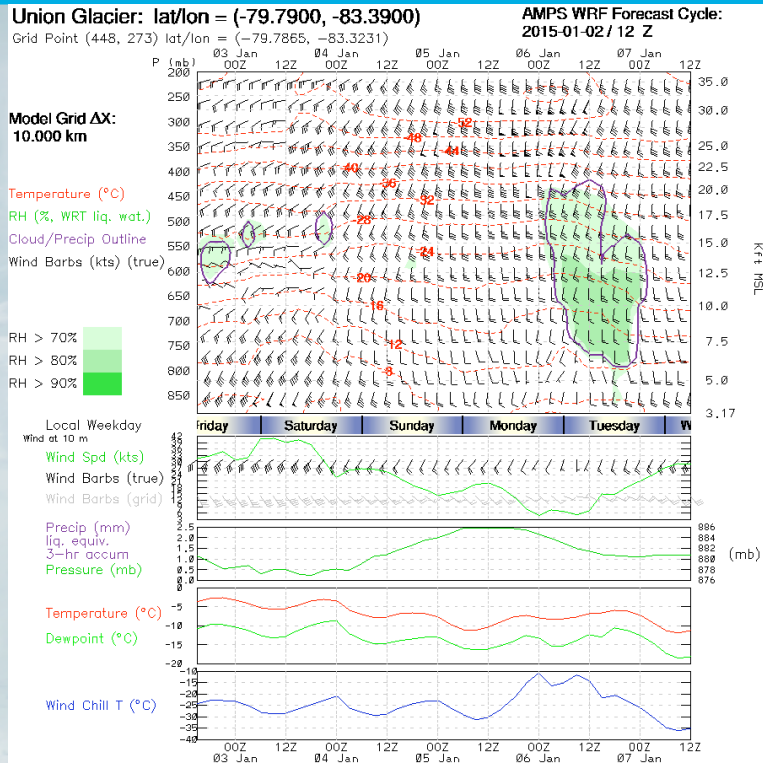
Outline

- AMPS Numerical Model
- Automatic Weather Stations
- SeaSpace Satellite Receiver

AMPS

- AMPS is a very important component in our weather forecasts and we are very grateful to be able to use it on a daily basis during the season ☺

- We receive charts by email and also utilise the website and Meteogram-on-demand

- Products Used Daily:
  - Soundings, Meteograms for many different locations
  - Upper Level Charts eg 500hPa
  - Surface and Upper Level Winds
  - Any many more……

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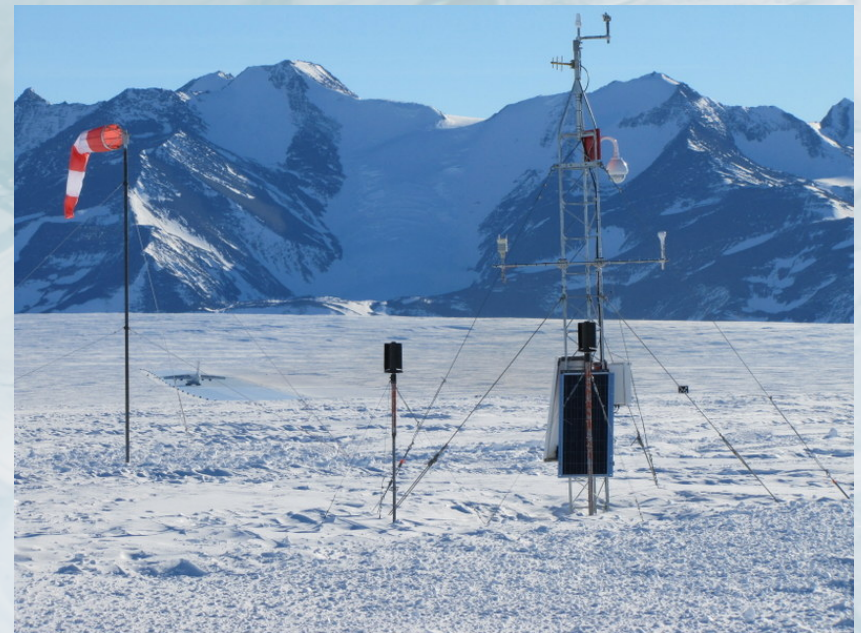
Products used Daily

Automatic Weather Stations

- Designed, built and installed by Ronald Ross
- 5 Stations in Use in 3 locations
  - Wx7 – Blue Ice Runway Union Glacier (SCGC)
  - Wx14 – Secondary (backup for Wx7)
  - Wx12 - Also at SCGC
  - Wx8 - Thiels Mountains
  - Wx11 - Skytrain Ice Rise

Wx7 – Blue Ice Runway

- Main Features:
- Vaisala Wx Station
- Garmin GPS
- Sony Camera – set positions but can be changed remotely if required
- 900MHz Antenna – transmits data back to Camp
- Data and imagery transmitted via Iridium
  - Available on www.thistle.org

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Wx14 – Blue Ice Runway

- Installed in 2014

- Backup for Wx7 – almost identical system and located next to it.

- Possibility of moving the older Wx7 to the Skiway, which would improve met support for Ski Aircraft.

Wx12 – Blue Ice Runway

Designed specifically to detect Drifting and Blowing Snow at the Blue Ice Runway

- High Resolution Mobotix (Security) Camera
- Camera Position is set but can Zoom in/out for finer detail
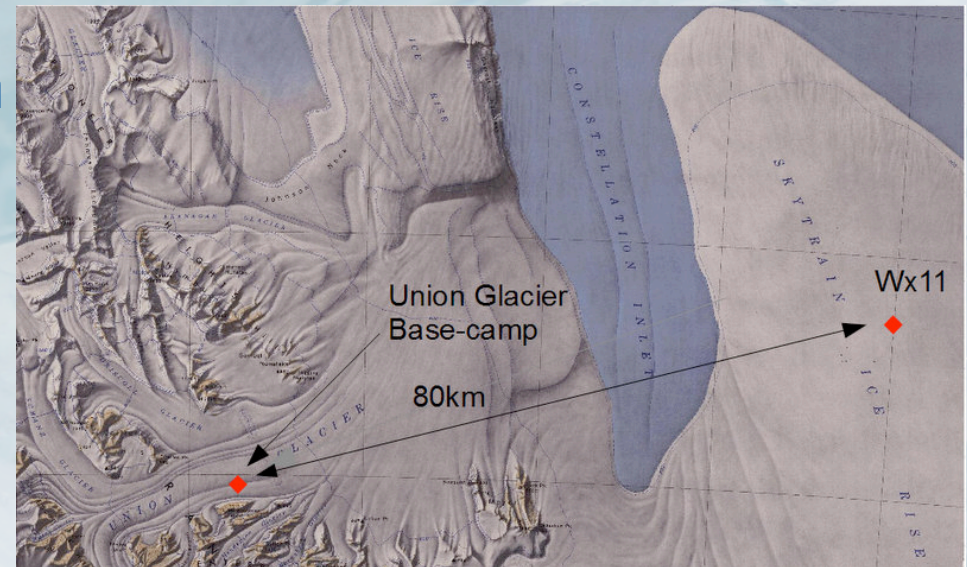- Data is transmitted to camp via wifi

Wx12 - Camera Display

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Wx11 – SkyTrain IceRise

- Designed to aid the early detection of FOG coming from the direction of the Ronne Ice Shelf
- 80km to the East

Wx11 – SkyTrain IceRise

- Sony Camera – pre-set positions but it can also be moved remotely

- Vaisala Weather Station

- Data sent via UHF

- Has proved very useful

Wx8 – Thiels Mountains

- Thiels Fuel Cache 85 South – Ski Aircraft fuel stop en route to South Pole
- 2 Cameras - 3 pictures taken every 30 mins
- Cloud Software - % Cloudiness calculated
- Also has the other usual Weather Sensors
- Data and Imagery via Iridium

Wx8 – Data Available

Latest from Wx8 @ Thiels

Images & weather are taken every 30 mins

Sun Dec 21 13:26:05 UTC 2014

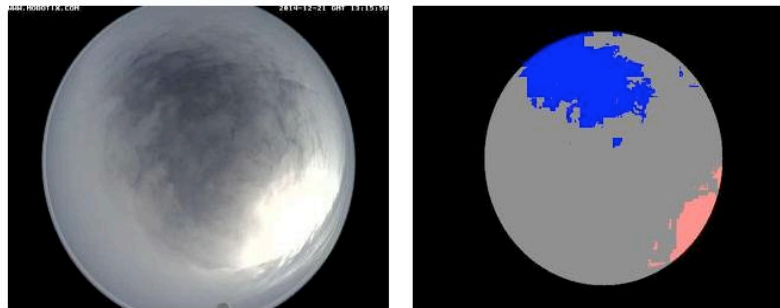Wind direction = 192 deg true Wind speed = 4.074 kts Wind gust = 4.268 kts

Air temperature -14.8 C Humidity = 74.0 % Pressure = 833.4 hPa
Battery = 13.50 V Current = 0.193 A PCB Temp = 21.59 C
Solar_snow = 0.00 V Solar_sky = 0.00 V UV = 0.00 V

Wx8 – Cloud Software

Latest from Wx8 @ Thiels

Images & weather from the SkyCam are taken every 30mins

Sun Dec 21 13:33:18 UTC 2014

Cloudiness = 83 %

Wind direction = 192 deg true Wind speed = 4.074 kts Wind gust = 4.268 kts

Air temperature -14.8 C Humidity = 74.0 % Pressure = 833.4 hPa
Battery = 13.50 V Current = 0.193 A PCB Temp = 21.59 C
Solar_snow = 0.00 V Solar_sky = 0.00 V UV = 0.00 V

SeaSpace Antenna

- Installed in 2013-2014 Season

- 0.61m L-Band flat plate antenna
- Mounted on a 3-axis positioner
- 0.90m Radome

- Receives and Processes data from current Polar Orbiting Met Satellites (NOAA and METOP)

0.61m Antenna

Reasons we chose this antenna

- Low Power Consumption
    - Rely mostly on Solar in UG
    - Main power user is the heating coil which keeps the inside of the Radome above freezing
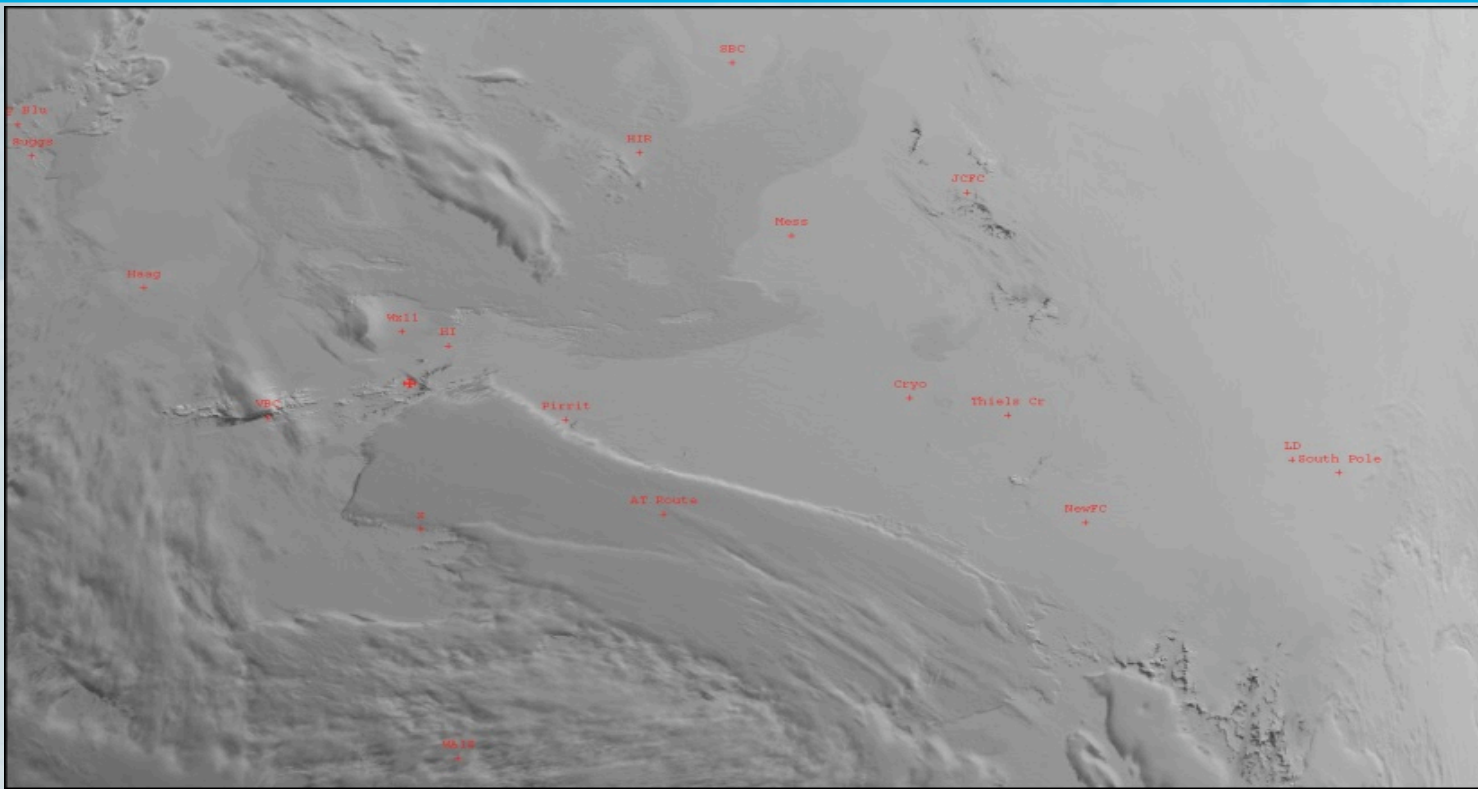- Compact and movable
    - No permanent structures at UG
    - We store the unit in Punta Arenas during the Winter to prevent cold damage
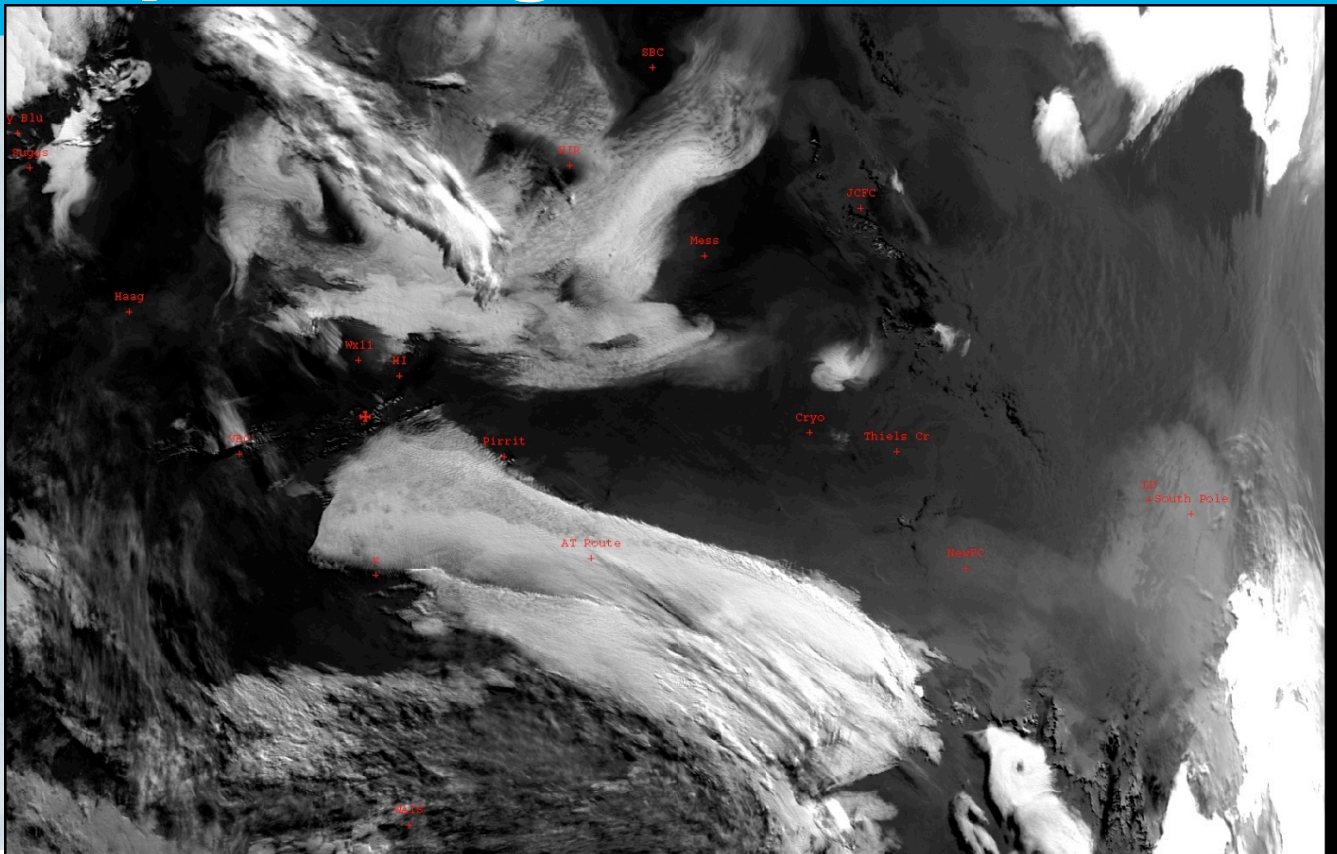
SeaSpace Software

- TeraScan Software Suite
- TeraVision – Visualisation Tool
  - Image Manipulations and Enhancements
  - Colour Adjustments
  - Overlays – boundaries, lat/long grids etc.
  - Annotations
  - Measurement Tools – distance/bearing/area etc.
  - Export images as jpeg,gif,tiff,png

Example Image NOAA19 CH1

Example Image NOAA19 CH3

SeaSpace Antenna - Overall

- Some power issues in poor weather
- Some positioning issues – has lost its GPS location on a few occasions
- Overall has greatly improved our forecasting capabilities and we are very happy with its operation.

Thank You! ☺

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