



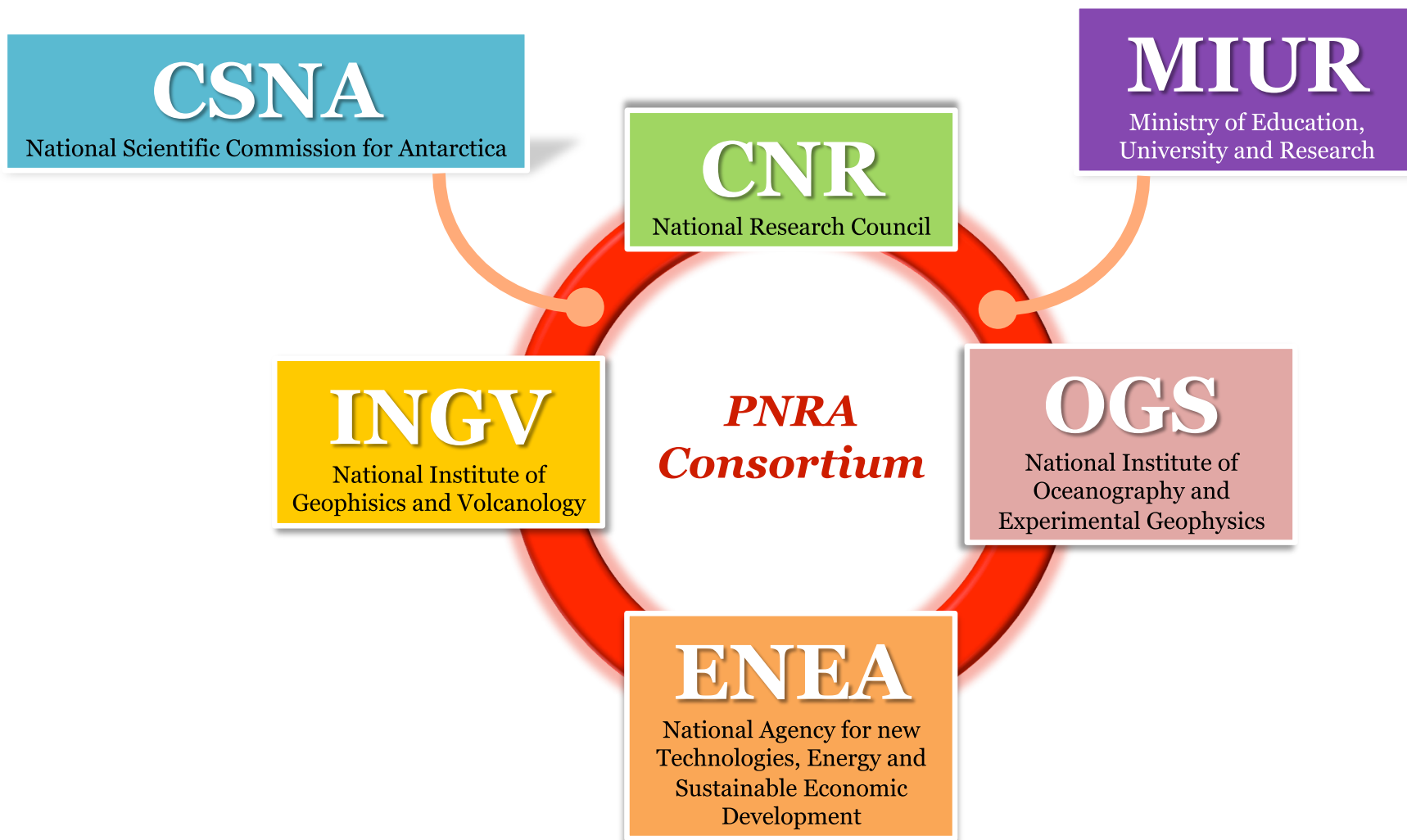
# OPERATIONAL METEOROLOGY AND THE METEO-CLIMATOLOGICAL ANTARCTIC OBSERVATORY

## AN OVERVIEW AND PLANS FOR XXIX ITALIAN EXPEDITION IN ANTARCTICA

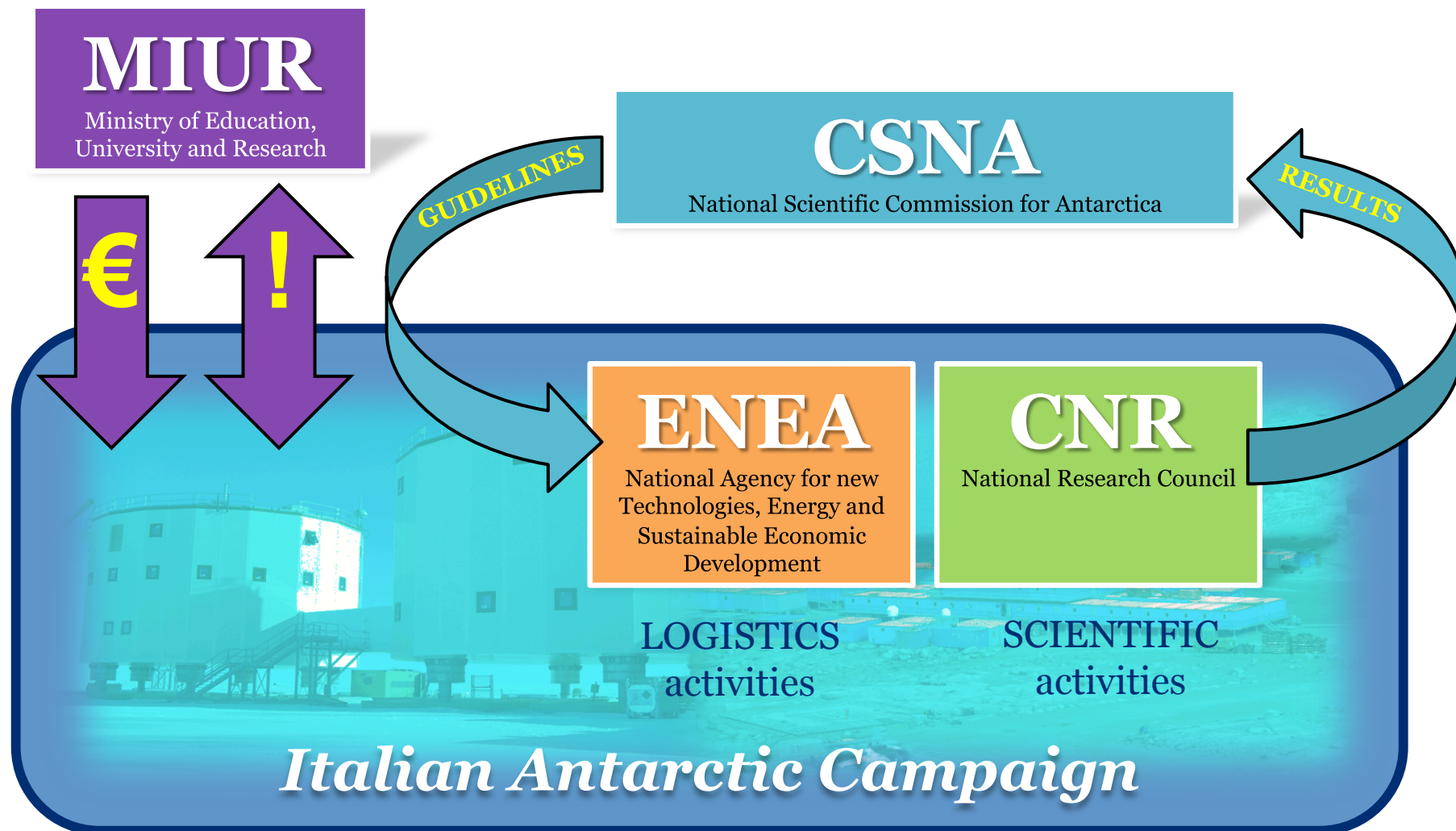
Dolci S., Grigioni P., De Silvestri L., Scarchilli C., Schioppo R., Iaccarino A. and Camporeale G.

*8th Antarctic Meteorological Observations, Modeling & Forecasting Workshop  
June 9-12, 2013 – Madison WI (USA)*

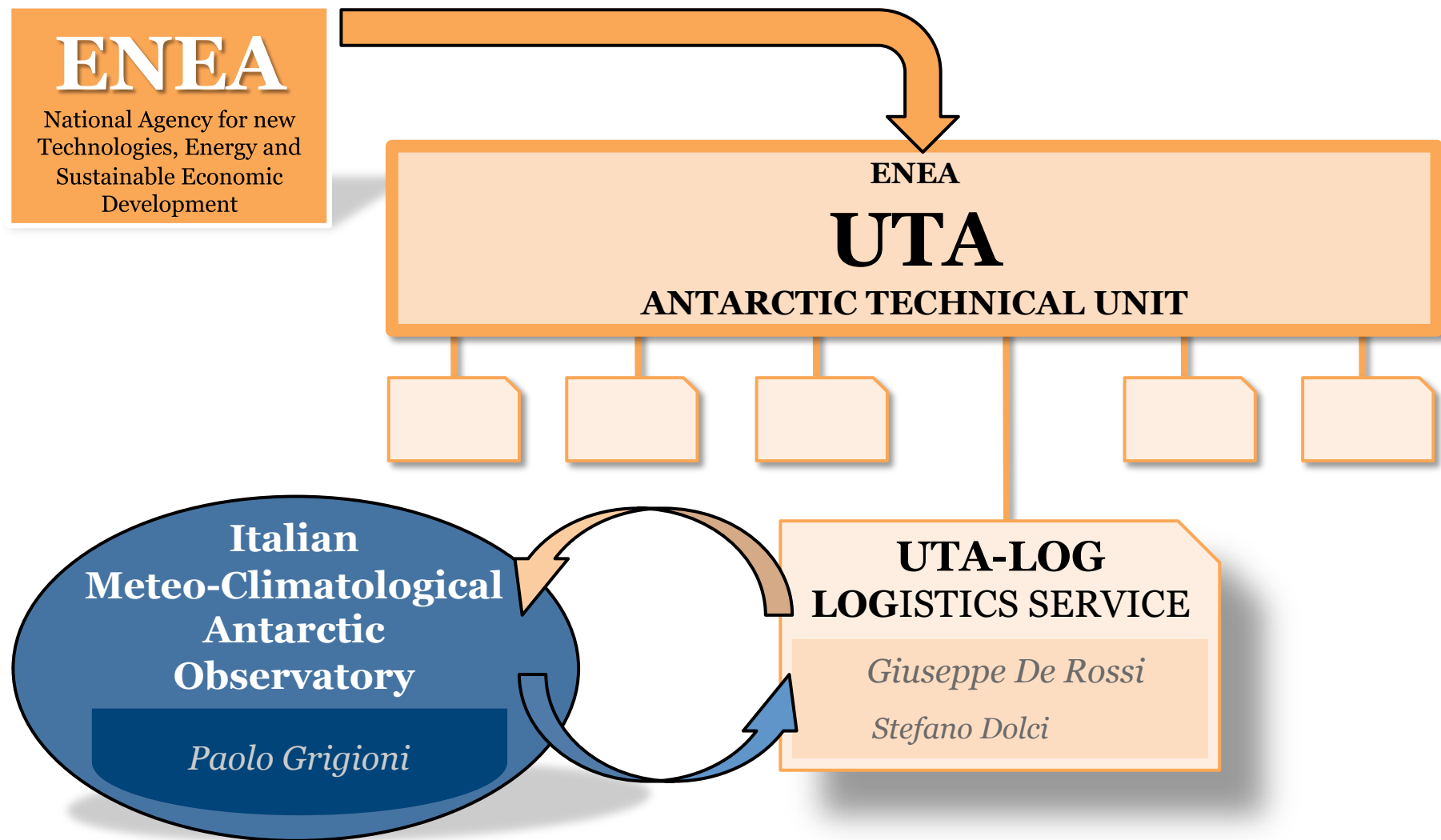
# BEFORE



# NOW *(Interministerial Decree 30 sept 2010)*



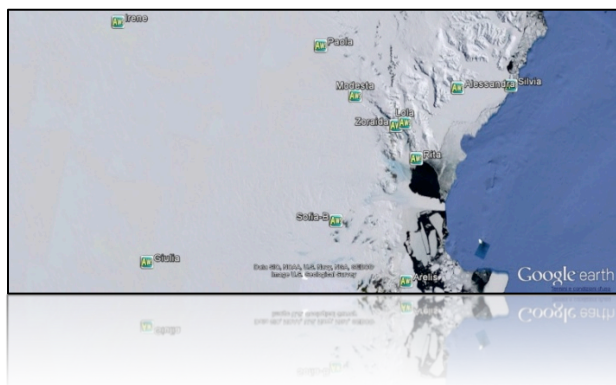
# NOW *(Interministerial Decree 30 sept 2010)*





# OVERVIEW

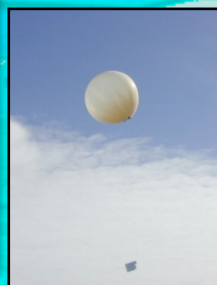
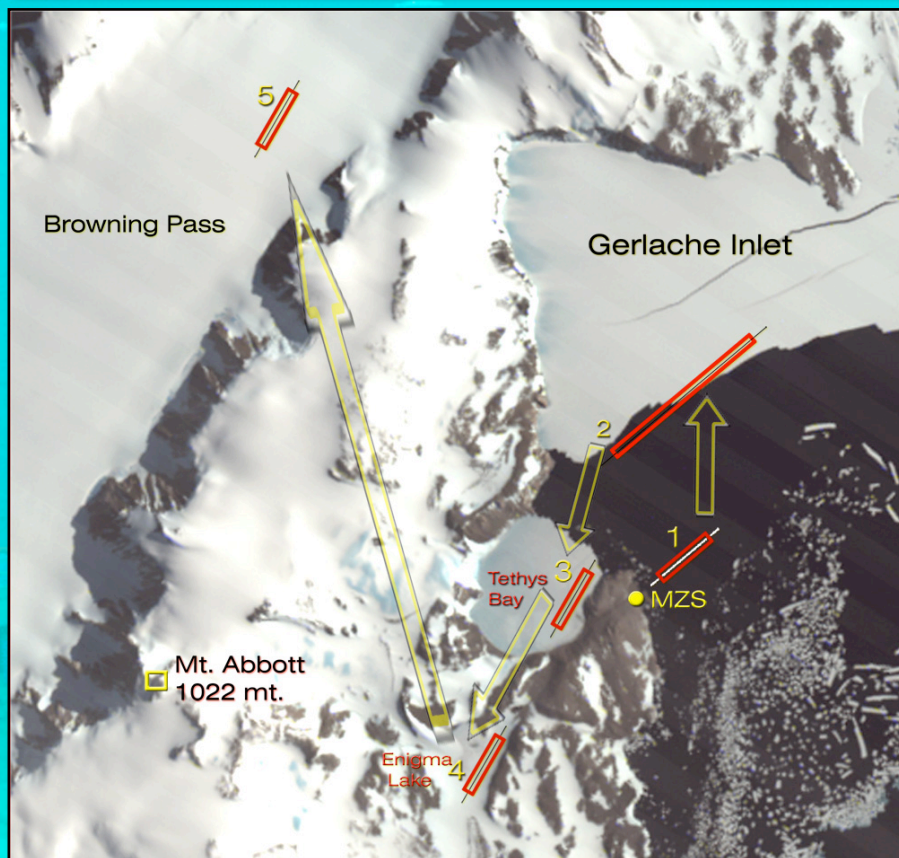




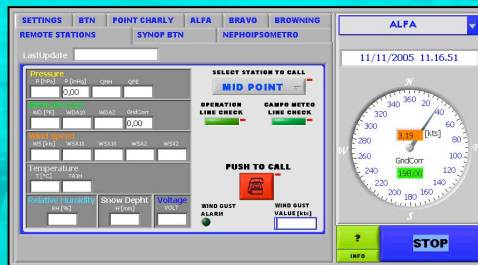
AWS	LOCATION	ARGOS ID	WMO ID	SYNOP
<b>Alessandra</b>	Cape King	X	-	-
<b>Arelis</b>	Cape Ross	X	89666	X
<b>Concordia</b>	Dome Concordia	X	89625	X
<b>Eneide</b>	Terra Nova Bay	X	89662	X
<b>Giulia</b>	<b>Mid Point</b>	X	89648	X
<b>Irene</b>	<b>Sitry</b>	X	89646	X
<b>Lola</b>	Tourmaline Plateau	X	-	-
<b>Lucia</b>	Larsen Glacier	-	-	-
<b>Maria</b>	Browning Pass	-	-	-
<b>Modesta</b>	High Priestley	X	89659	X
<b>Paola</b>	<b>Talos Dome</b>	-	-	-
<b>Penguin</b>	Edmonson Point	-	-	-
<b>Rita</b>	Enigma Lake	X	-	-
<b>Silvia</b>	Cape Phillips	X	89661	X
<b>Sofia-b</b>	David Glacier	X	-	-
<b>Zoraida</b>	Medium Priestley	X	-	-



## M. Zucchelli Station

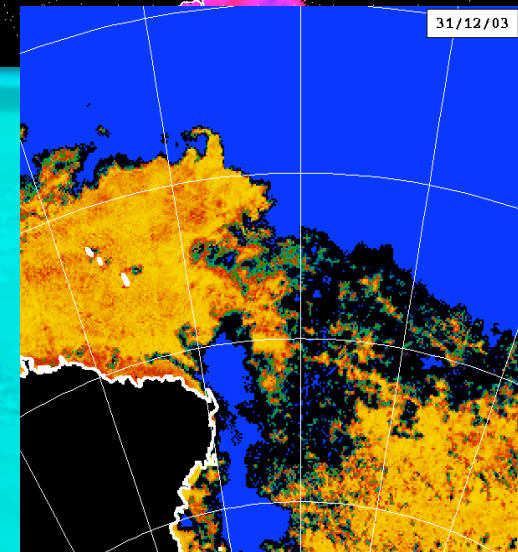
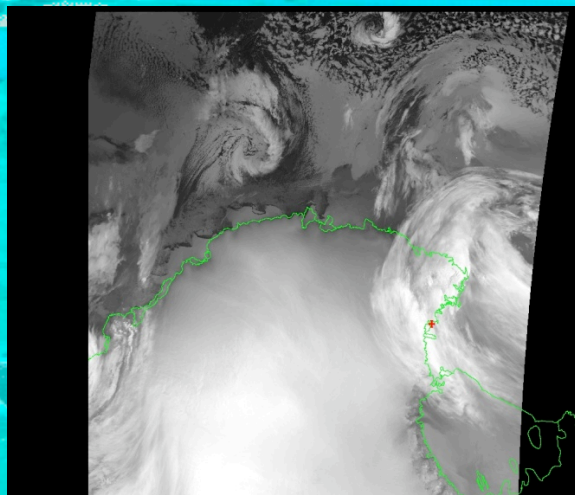
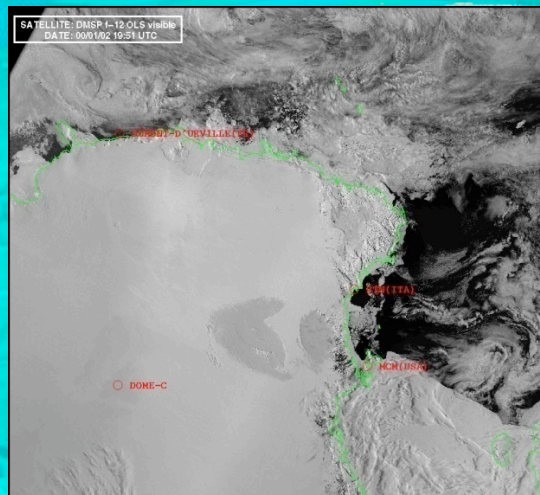
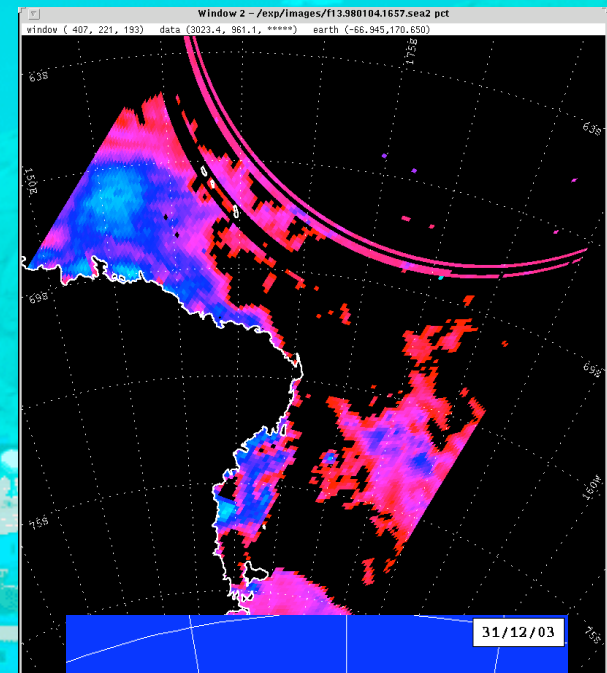
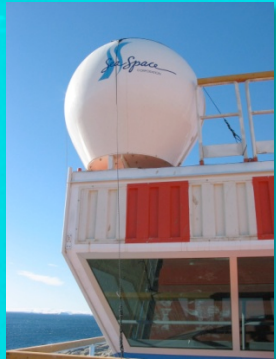


AWS	LOCATION
<b>Alfa</b>	MZS ice runway
<b>Bravo</b>	MZS ice runway
<b>Enigma</b>	MZS Enigma airstrip
<b>Minni</b>	MZS Browning Pass airstrip
<b>Helipad</b>	MZS Helicopters' pads
<b>Tania (Tacmet)</b>	MZS Gerlache Inlet

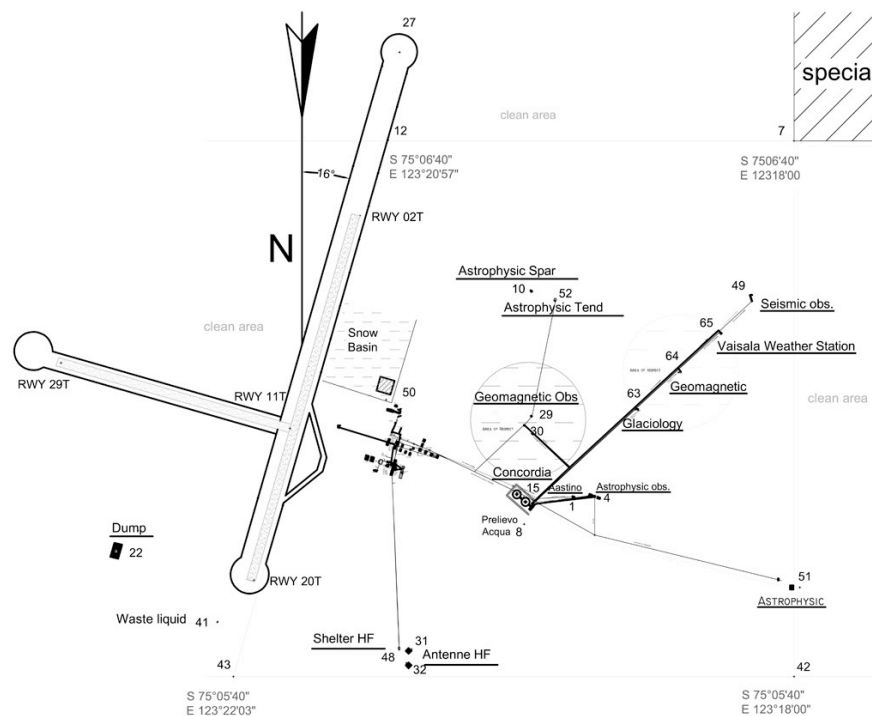




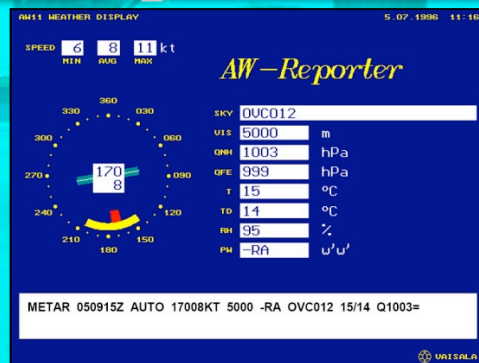
## M. Zucchelli Station



## Concordia Station



AWS	LOCATION
AW11	CONCORDIA airstrip







MESSAGE TYPE	TIME	DESTINATION
<b>TAF</b>	00, 06, 12, 18 UTC	Continental addresses, GTS (via AM)
<b>METAR</b>	hourly	Continental addresses
<b>SYNOP</b>	00, 06, 12, 18 UTC	GTS (via AM)
<b>TEMP</b>	00, 12 UTC	GTS (via AM)



MESSAGE TYPE	TIME	DESTINATION
<b>SYNOP</b>	00, 06, 12, 18 UTC	GTS (via AM)
<b>TEMP</b>	12 UTC	GTS (via AM)

# PLANS





## AWS MANUELA maintenance agreement

Former Name: **Inexpressible Island**

Owner: **UW**

Initial Start Date: **1984-02-06**

Info from Service Visit: **1987-02-15**

Latitude: **-74.946 S**

Longitude: **163.687 E**

Elevation: **78 meters**

WMO ID: **89864**

AWS Model: **AWS2B**

ARGOS ID: **8905**

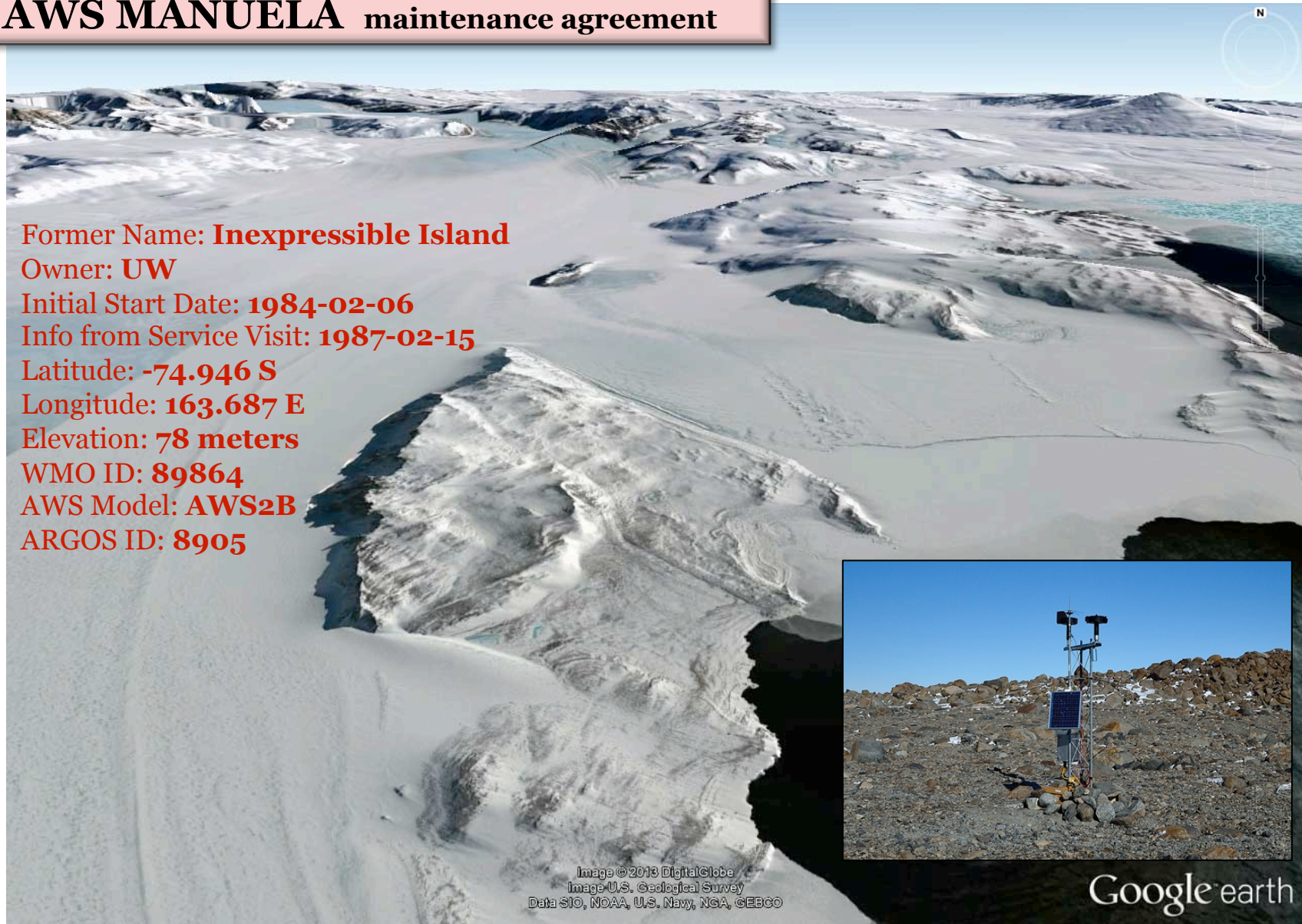


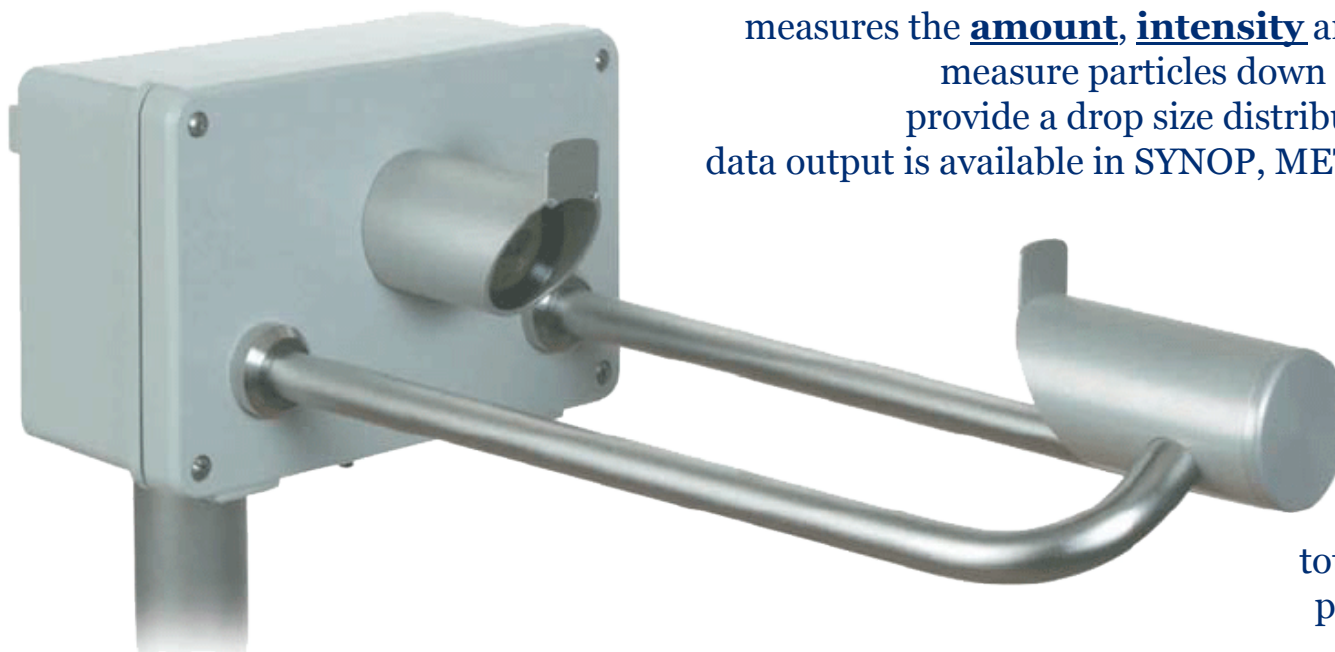
Image © 2013 DigitalGlobe  
Image U.S. Geological Survey  
Data SIO, NOAA, U.S. Navy, NGA, GEBCO

Google earth



## Laser Precipitation Monitor installation

1/2



### MAIN CHARACTERISTICS

measures the **amount**, **intensity** and **type** of precipitation  
measure particles down to **0.16 mm diameter**  
provide a drop size distribution with **400 classes**  
data output is available in SYNOP, METAR, NWS, and in 4678  
and 4680 WMO code  
mains or battery power

### OUTPUTS

total precipitation quantity  
particles speed / diameter  
intensity mm/h  
precipitation class (SYNOP/METAR)  
radar reflectivity (Z/R ration)  
MOR (Meteorological Optical Range) in rain

### OPERATING TEMPERATURE

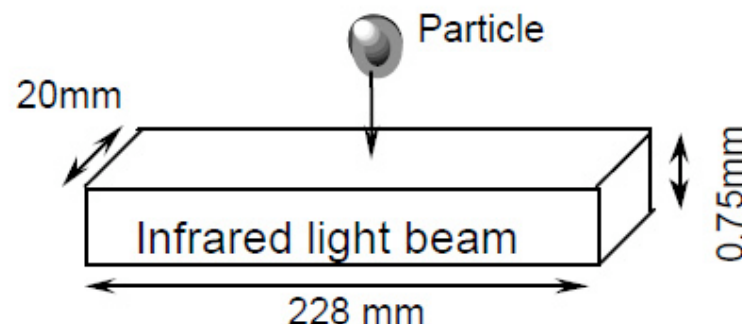
(optical components are equipped with integrated heating as standard): - **40 ° C** to + **70 ° C**  
with extra heating option (available for mains voltage models): - **60 ° C** to + **70 ° C**  
humidity: **0 to 100%**

## Laser Precipitation Monitor installation

2/2

### PRECIPITATION

Particle size: **0,16...7 mm**  
Particle velocity: **0,2 ... 20 m/s**  
Distinction for kind of precipitation drizzle, rain, hail, snow  
Minimum intensity: **0,005 mm/h drizzle**  
Maximum intensity: **250 mm/h**



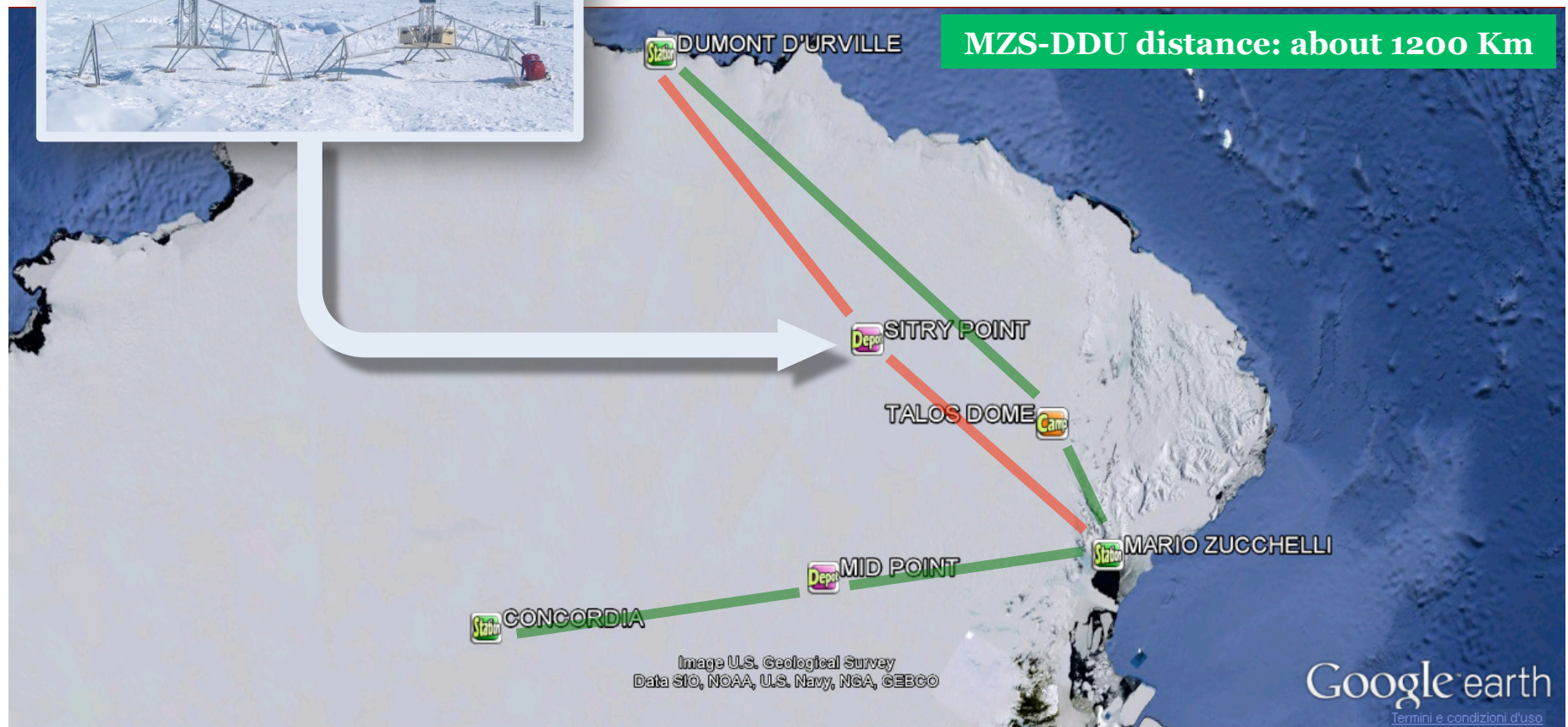
The LPM uses reliable laser-optics to detect and discriminate different kinds of precipitation including:

drizzle (**DZ**)  
freezing drizzle (**FZDZ**)  
rain (**RA**)  
freezing rain (**FZRA**)  
hail (**GR**)  
snow (**SN**)  
snow grains (**SG**)  
ice needles (**IC**)  
soft hail (**GS**)  
ice grains (**PL**)

## Sitry Point decommission



- Sitry Point site surface dangerous roughness (*sastrugi*)
- More intensive use of aircrafts with longer flight range before they need refueling (e.g. *Basler*)
- In years to come Talos Dome will be used and manned





## Enigma Lake airstrip: new permanent AWS



permanent  
Vaisala MAWS 301  
with Present Wather Detector

## SWS (*Standard Weather Station*) software platform adoption

1/2



Developed, adopted and maintained by the  
*Italian National Meteorological Service (CNMCA)*



- Based on open source platform and languages (1)
- Unified interface for feeding, compiling and transmitting meteorological messages
- Support TAC and BUFR message format
- Feed once, compile many
- Significant reduction of human compiling errors
- Automatic remainder and transmission
- Possibility to interface digital sensors

1. JAVA, PHP + Javascript, MySQL, Apache Web server  
Fortran routines for the BUFR messages coding



# SWS (Standard Weather Station) software platform adoption

2/2

## INGEST

- Gathers, validates, processes and archives atmospheric variables
- Creates the instantaneous variables db
- Creates the representative variables db
- Creates the derived representative variables db

## GUI

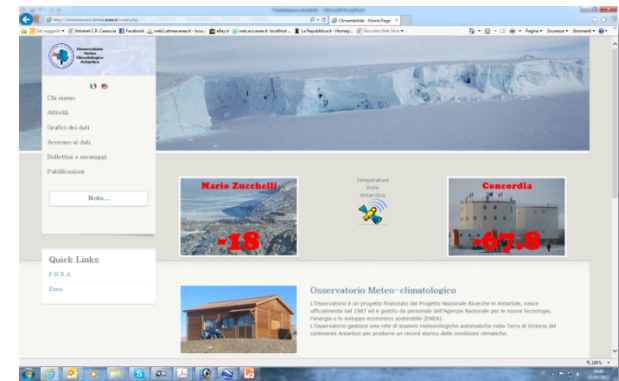
Various levels of user privileges

## SENDER

Responsible for messages transmission

TCP/IP (via FTP)  
Serial  
Leased and switched line

Code	Variable	Table	Value	Unit	Sensor status	Coding
T1A	Air temperature	(AIR_TEMPERATURE)	28.8	C	ok	
RH1A	Relative humidity	(AIR_TEMPERATURE)	48	%	ok	
P1A	Atmospheric pressure	(ATMOSPHERIC_PRESSURE)	983.6	hPa	ok	
CL1A	Cloud base (low)	(NEFO_DATA)	NC	m	ok	
CM1A	Cloud base (middle)	(NEFO_DATA)	NC	m	ok	
CH1A	Cloud base (height)	(NEFO_DATA)	NC	m	ok	
PREC1A	Precipitation	(PRECIPITATION_AMOUNT)	0	mm/min	ok	
SOLR1A1T	Solar radiation	(SOLRADIATION_AMOUNT)	47248.41	W/m <sup>2</sup>	ok	
SUNDUR1T	Soleggiamento	(SUNDURATION_AMOUNT)	60	s/min	ok	
WD02A	Wind direction	(WIND_DATA)	N/A	deg	Not responding	
WS02A	Wind speed	(WIND_DATA)	N/A	lt	Not responding	
WD1A	Wind 1 min	(WIND_DATA)	N/A	lt	Not responding	
WD1A	Win 1 min dir.	(WIND_DATA)	N/A	deg	Not responding	
WD10A	Wind direction	(WIND_DATA)	N/A	deg	Not responding	
WS10A	Wind speed	(WIND_DATA)	N/A	lt	Not responding	
WD2A	Wind direction	(WIND_DATA_GILL)	280	deg	ok	
WS2A	Wind speed	(WIND_DATA_GILL)	8.6	lt	ok	
WD1A	Wind 1 min	(WIND_DATA_GILL)	9	lt	ok	
WD1A	Win 1 min dir.	(WIND_DATA_GILL)	215	deg	ok	
WD10A	Wind direction	(WIND_DATA_GILL)	280	deg	ok	
WS10A	Wind speed	(WIND_DATA_GILL)	8.2	lt	ok	
WD10AMD	Wind direction	(WIND_METAR_DATA)	N/A	deg	Not responding	
WS10AMD	Wind speed	(WIND_METAR_DATA)	N/A	lt	Not responding	
WD3A10M	Wind dir min	(WIND_METAR_DATA)	N/A	deg	Not responding	
WD3A10X	Wind dir max	(WIND_METAR_DATA)	N/A	deg	Not responding	
WS3A10X	Wind speed max	(WIND_METAR_DATA)	N/A	lt	Not responding	
GUST110	Gust	(WIND_METAR_DATA)	N/A	lt	Not responding	
GUST100	Gust dir.	(WIND_METAR_DATA)	N/A	deg	Not responding	
GUST12	Gust 2 min	(WIND_METAR_DATA)	N/A	lt	Not responding	
WS3A1X	Wind 3 min	(WIND_METAR_DATA)	N/A	lt	Not responding	

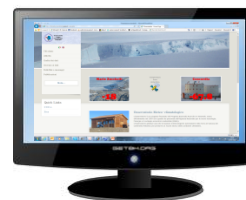


The current site has a fixed width of 900 pixels, the new site will have a **dynamic width** up to 1600 pixels.



If you resize the browser window, the new website will rearrange components to fit in it: menus dynamically shift, text and images change size.

With the new look, the site will be optimized for:

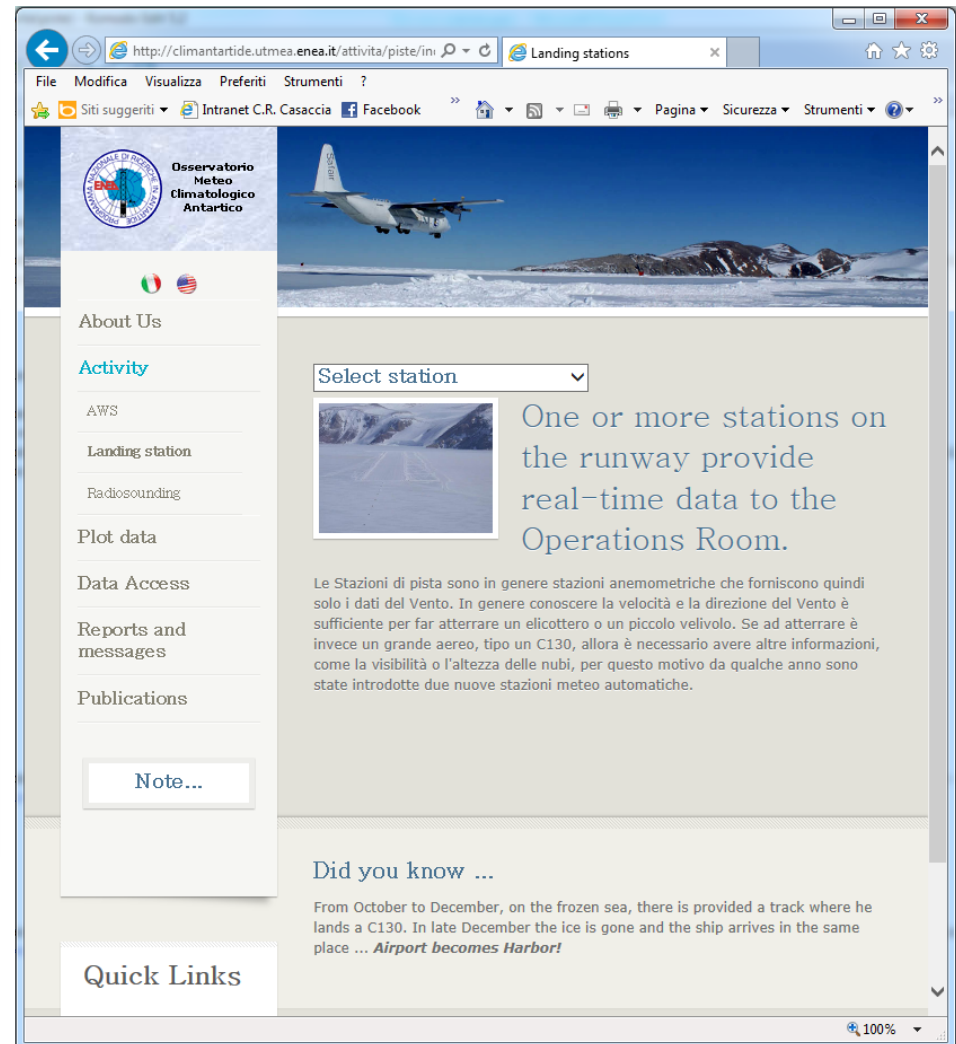


While keeping the scientific content, the new website opens to a **broader audience**, simplifying topics' explanation and favoring disclosure to students.

*“Did you know...”* and *“Curiosity...”* sections are often found at the bottom of the pages in order to **capture the attention** and **stimulate reading** the article.

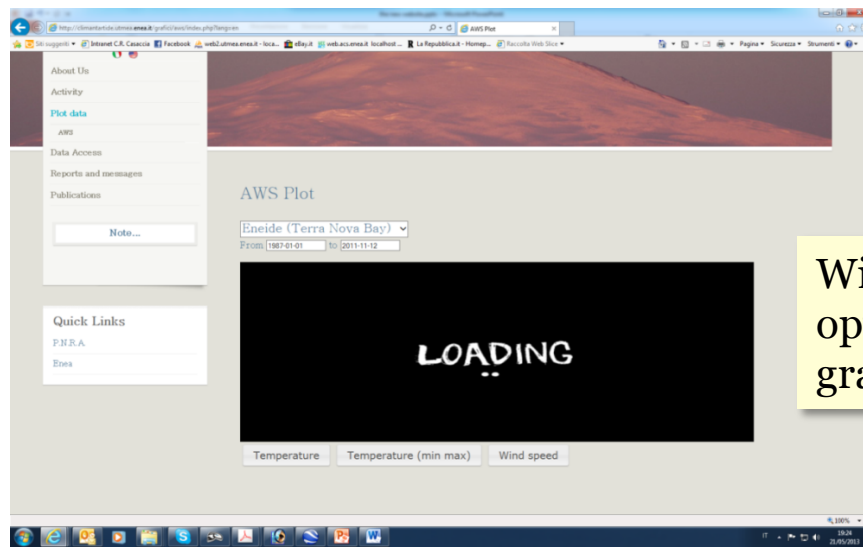
Common users are often attracted by photos: that's why the new website was redesigned highlighting **pictures of Antarctic places** where we work.

**New sections** were added and a **new data classification** was adopted.

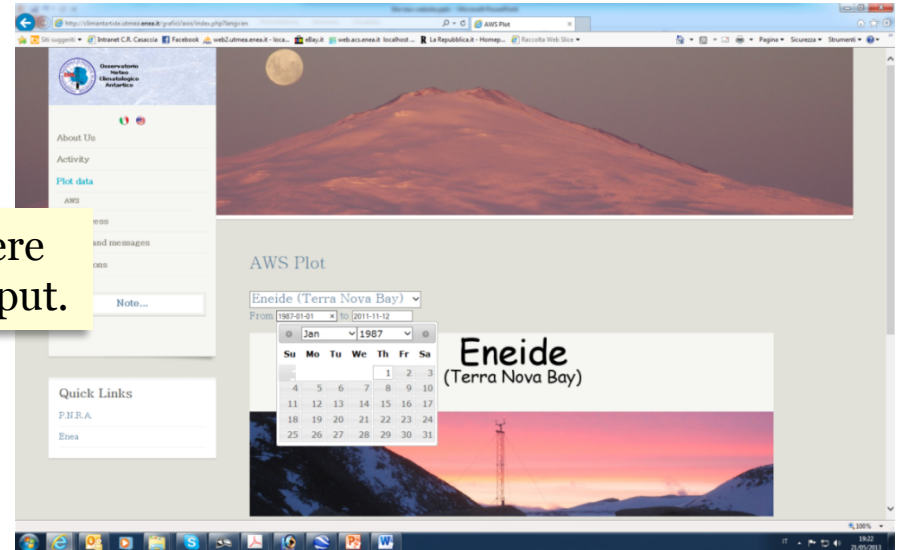





New graphic interfaces for database queries were added in order to avoid invalid range values input.



With the development of new procedures and optimization of the database, the production of graphic plots is much more rapid.





*Thanks for your attention...*