ARGOS REAL-TIME ANTENNA UPGRADE PROJECT

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GENEVA SWITZERLAND
SEPTEMBER 26, 2011

TODAY'S PRESENTATION

- WHY UPGRADE THE CURRENT NETWORK ?
- THE UPGRADE OBJECTIVE & APPROACH
- PLAN/SCHEDULE
- IMPACT TO DBCP

TODAY'S NETWORK – 60 STATIONS

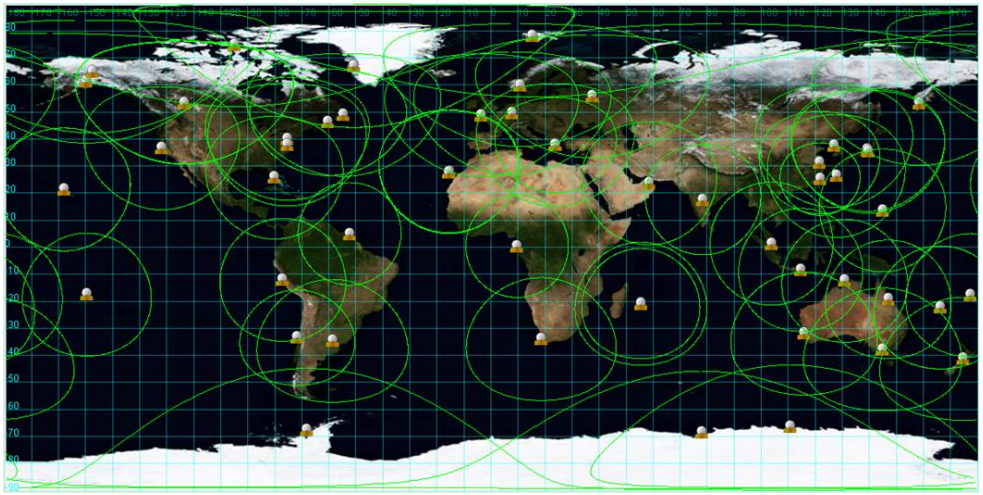
SOUNDS LIKE A LOT – WHY UPGRADE IT ?

- NON-UNIFORM & LIMITED MIX OF SATS THAT ARE RECEIVED – METOP/SARAL ARE NEEDED
- LOCATION/OPERATORS ARE NOT OPTIMUM
- DAYS IN OPERATION ARE NOT CONSISTENT
- % OF DATASETS RECEIVED vs. EXPECTED IS LOW
- DATA DELIVERY TIMES ARE VARIABLE AND NOT RELIABLE

"CREATE THE NETWORK WE NEED NOT JUST USE WHAT MIGHT BE AVAILABLE"

OBJECTIVE

IMPLEMENT AN OPTIMIZED AND RELIABLE GLOBAL NETWORK OF REAL-TIME ANTENNAS WHICH MINIMIZES THE DELIVERY TIME OF ARGOS PTT/PMT DATA



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UPGRADE APPROACH

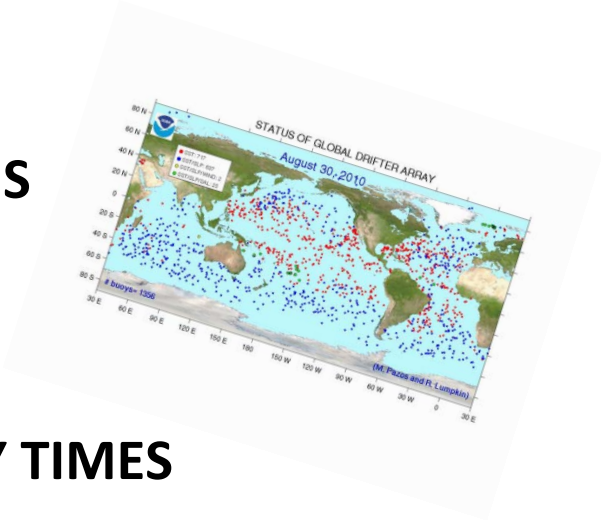
- UPGRADE A SUBSET OF EXISTING L-BAND ANTENNAS TO RECEIVE DATA FROM ALL SATELLITES CARRYING ARGOS (NOAA, METOP, SARAL)

- INSTALL NEW ANTENNAS AND/OR CONNECT TO OTHERS WHERE NEEDED

- CONDUCT SYSTEM STUDIES TO DEFINE CANDIDATE ANTENNAS – BUDGET LIMITED TO ~ 20

SYSTEM STUDIES

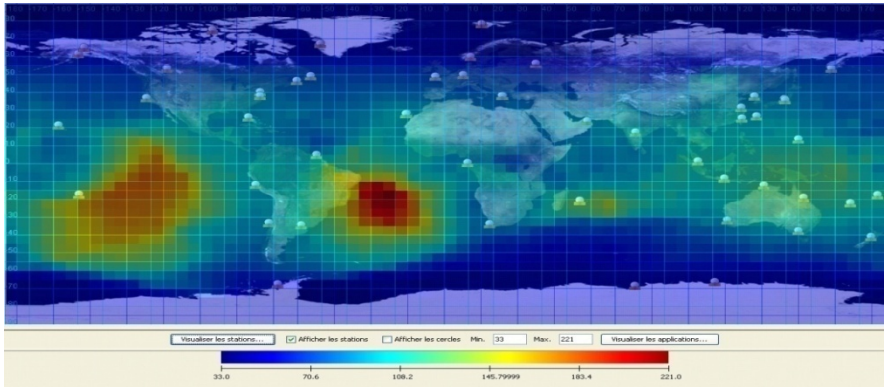
WHAT WAS CONSIDERED:



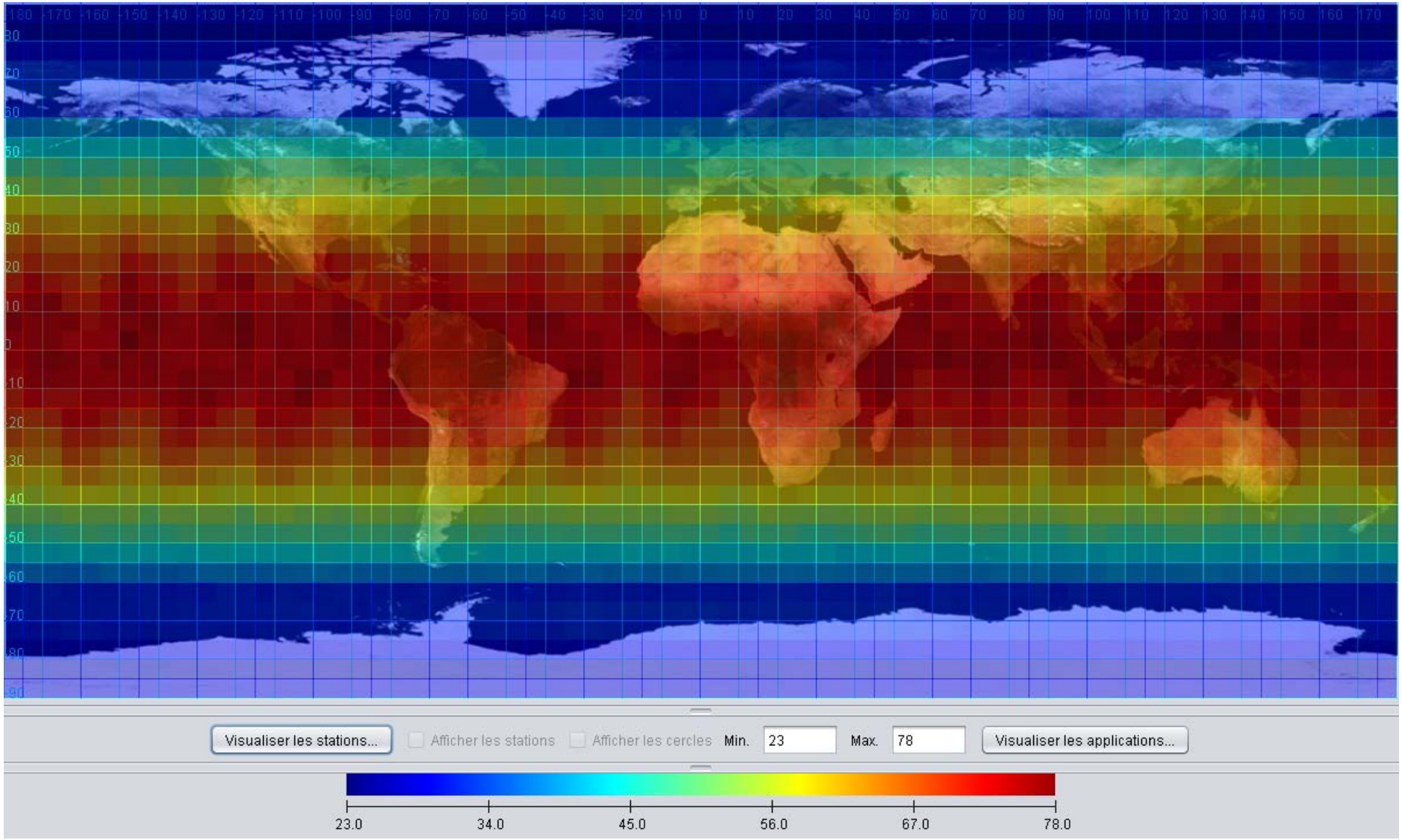
- LOCATION/AVAILABILITY OF EXISTING STATIONS
- EXISTING SATELLITES (6) + SARAL & METOP-B
- APPLICATIONS WITH SENSITIVE DATA DELIVERY TIMES
- GEOGRAPHIC DISTRIBUTION OF MAIN APPLICATIONS & AREAS REQUIRING PRIORITY COVERAGE
- EXISTING STATIONS WHICH QUALIFY FOR UPGRADING TO ADEQUATE DISH SIZE TO ENSURE LINK BUDGETS
- NEW SARAL REAL-TIME STRATEGY (last 100 minutes)

ANTENNA SELECTION

- REFINE ANTENNA CHOICES BY ANALYZING DELIVERY TIME PERFORMANCE OF UPGRADE SCENARIOS WITH CLS DEVELOPED SIMULATION TOOL
- TOOL CALCULATES THE AVERAGE TIME FOR A PLATFORM TO DELIVER ITS DATA AS A FUNCTION OF:
  - THE ARGOS SATELLITE CONSTELLATION (real parameters, simulated SARAL)
  - THE REAL ANTENNAS OF THE NETWORK AND THEIR CHARACTERISTICS
- RESULTS DISPLAYED ON A 5° X 5° GRID



ARGOS AVERAGE REVISIT TIME
CURRENT 6 SATELLITE CONSTELLATION



A 6-satellites as exists today or a potential 8-satellites constellation (2012-2015 period) insure optimized revisit time around 1 hour for equatorial latitudes and around 30 min above 60° of latitude.

The target limit of 2h of data disposal time to users is almost covered for all applications (~95% with the 6-satellites constellation today, ~100% with the potential 8-satellites constellation for the 2012-2015 period). Furthermore, the HRPT stations upgrade plan, currently in progress, would significantly improve the amount of Argos data made available to users within 1h (goal of ~50%)

UPGRADE SCHEDULE

- **UPGRADE 3 CLS STATIONS:**

  [LIMA, HATOYAMA, LANNION] — Completed

- **UPGRADE 9 'NON-CLS' EXISTING STATIONS:**

  [REUNION, MONTERY, MIAMI, ~~BALI~~] — End of 2011

  [RESOLUTE BAY, OMAN, ATHENS, LAS PALMAS, PAPEETE] — End of 2012

- **PROCURE AND INSTALL 2 NEW STATIONS:**

  [CAPETOWN] — Late 2011

  [ASCENSION ISLAND] — During 2012

- **UPGRADE 3 EXISTING AUSTRALIAN STATIONS:**

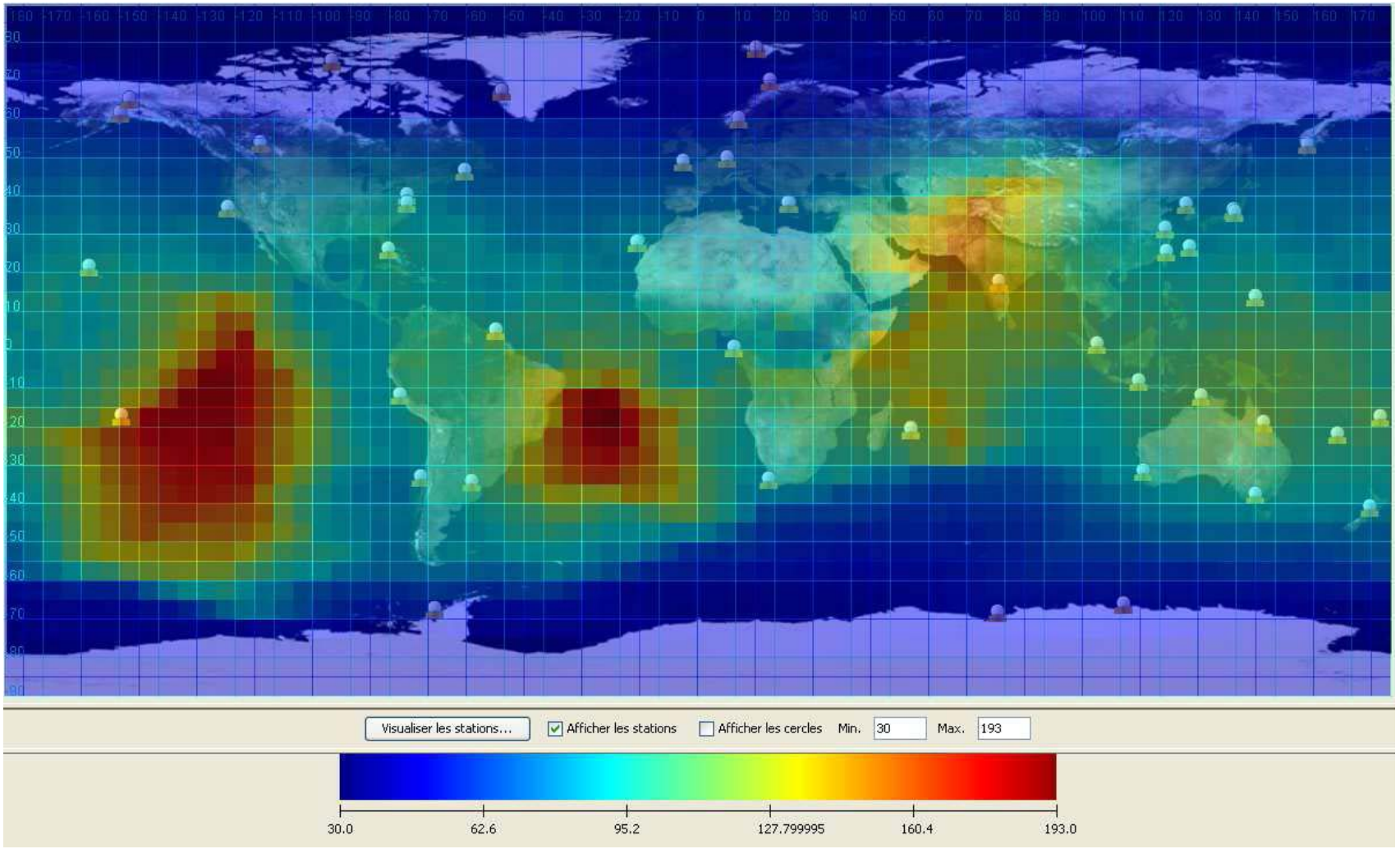
  [DAVIS, CAPE FERGUSON, WELLINGTON] — During 2012

SELECTED ANTENNAS

YELLOW	CLS STATIONS (3)	ORANGE	Upgraded by BOM/ES&S (3)
RED	New Antennas (2)	WHITE	Existing Stations (9)

MARCH 2010

ARGOS MEAN DATA DISPOSAL TIME



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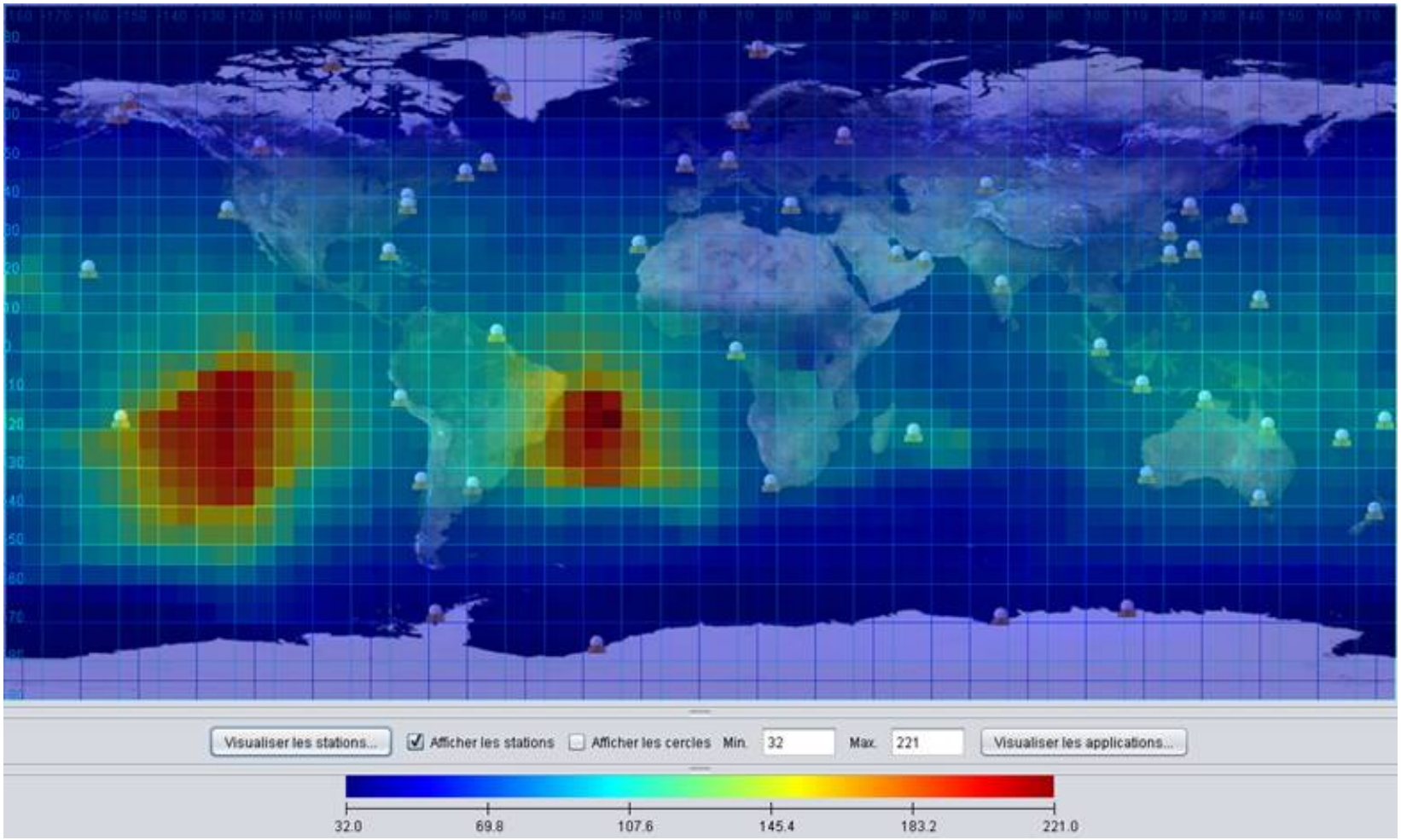
MARCH 2011

- ADDING OMAN STATION
- IMPROVING HYDERABAD AND REUNION STATION PERFORMANCE
- INCREASED METOP-A HRPT COVERAGE (more stations + descending and ascending orbits)



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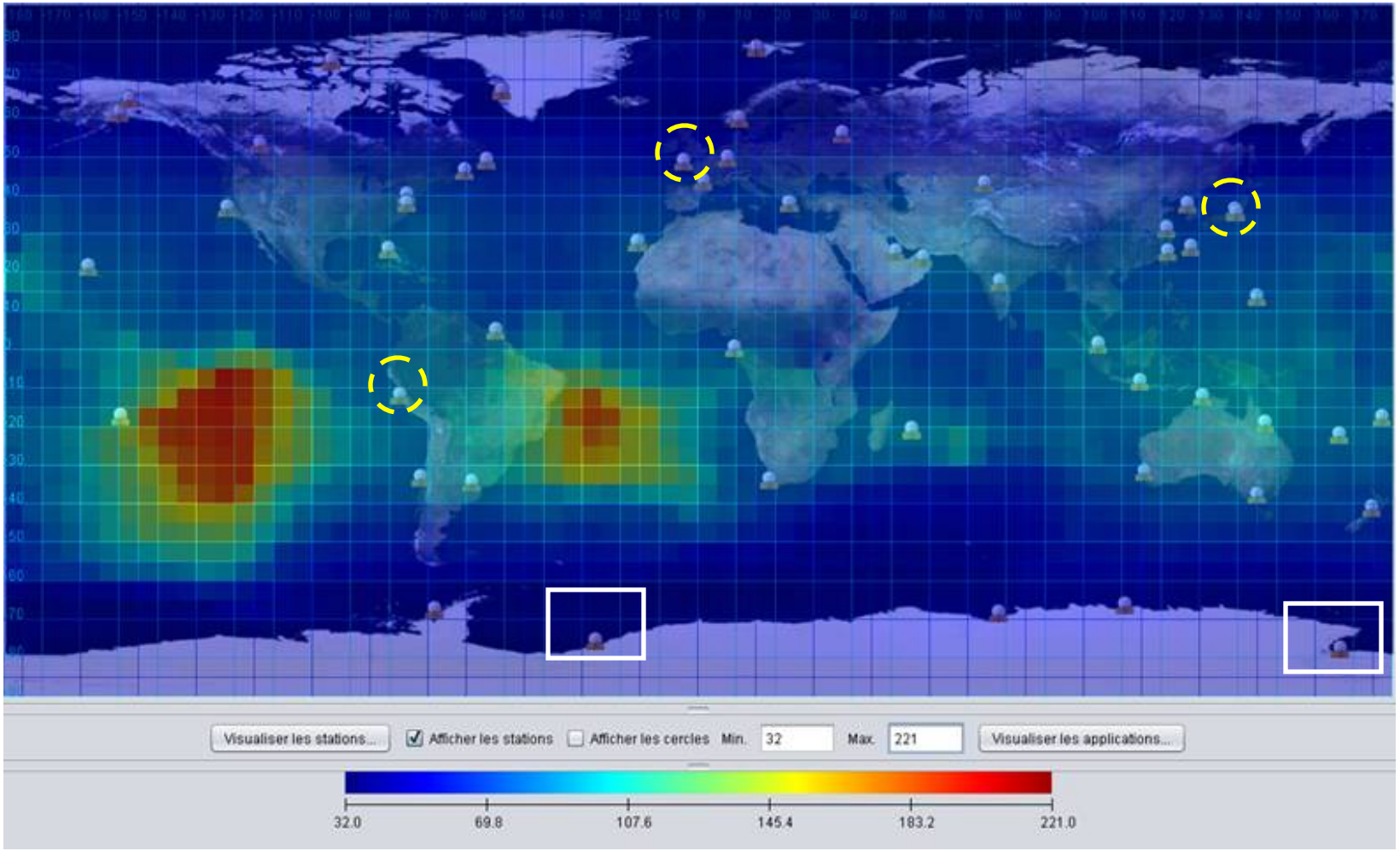
JUNE 2011

- 3 UPGRADED CLS STATIONS
- 2 ANTARCTIC STATIONS: MCMURDO & HALLEY



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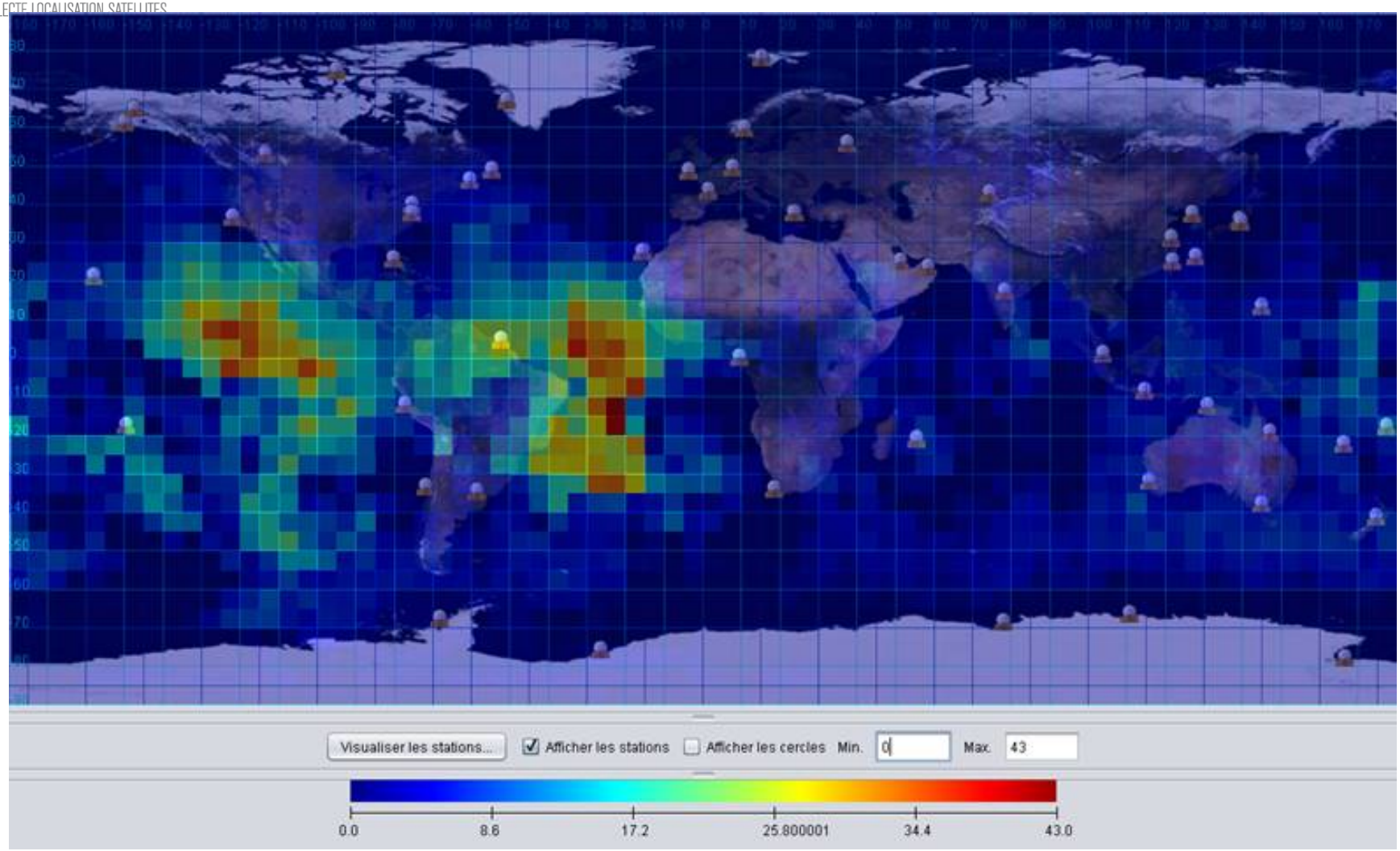
REDUCTION IN MEAN DISPOSAL TIME BETWEEN MARCH 2011 AND JUNE 2011



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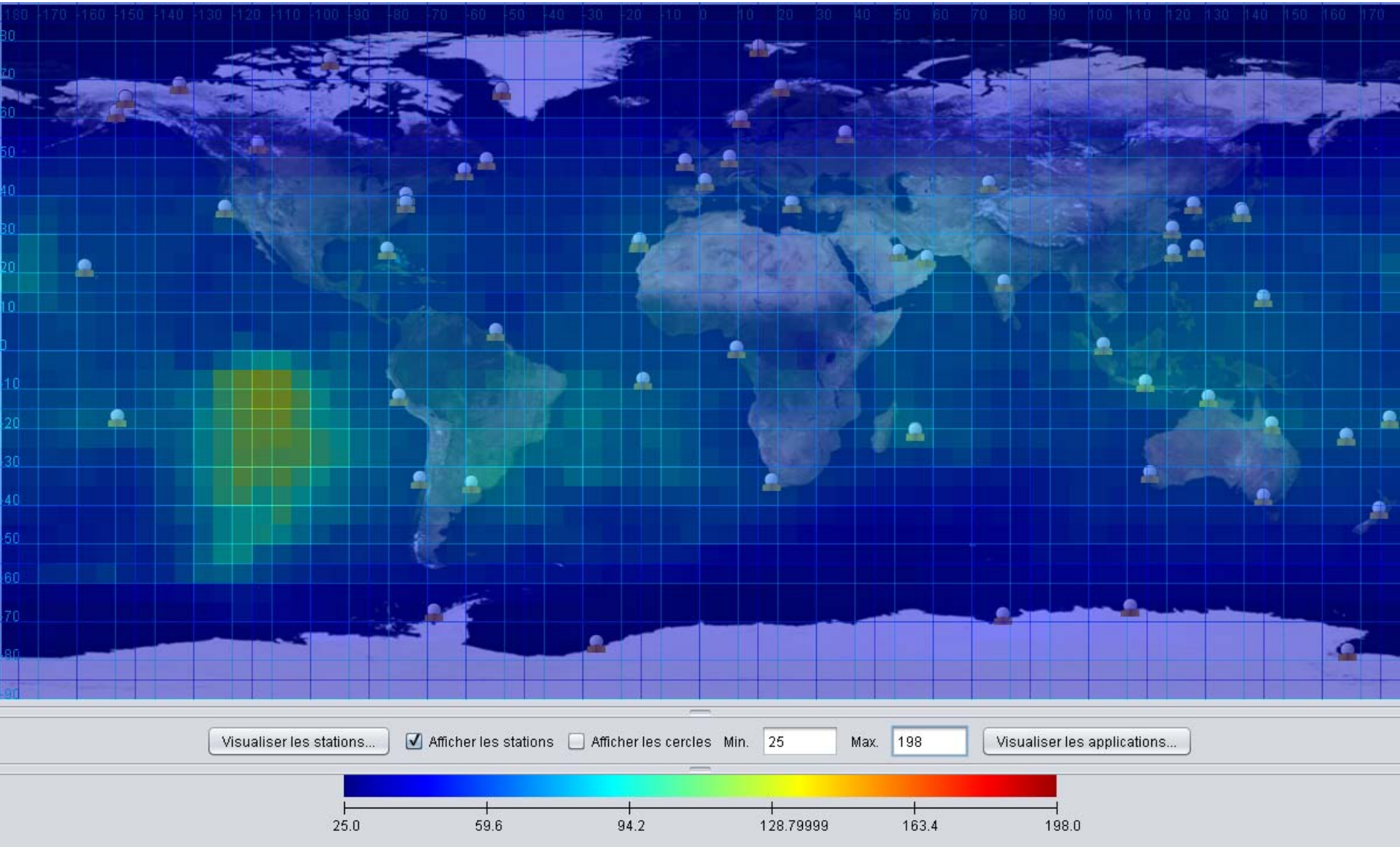
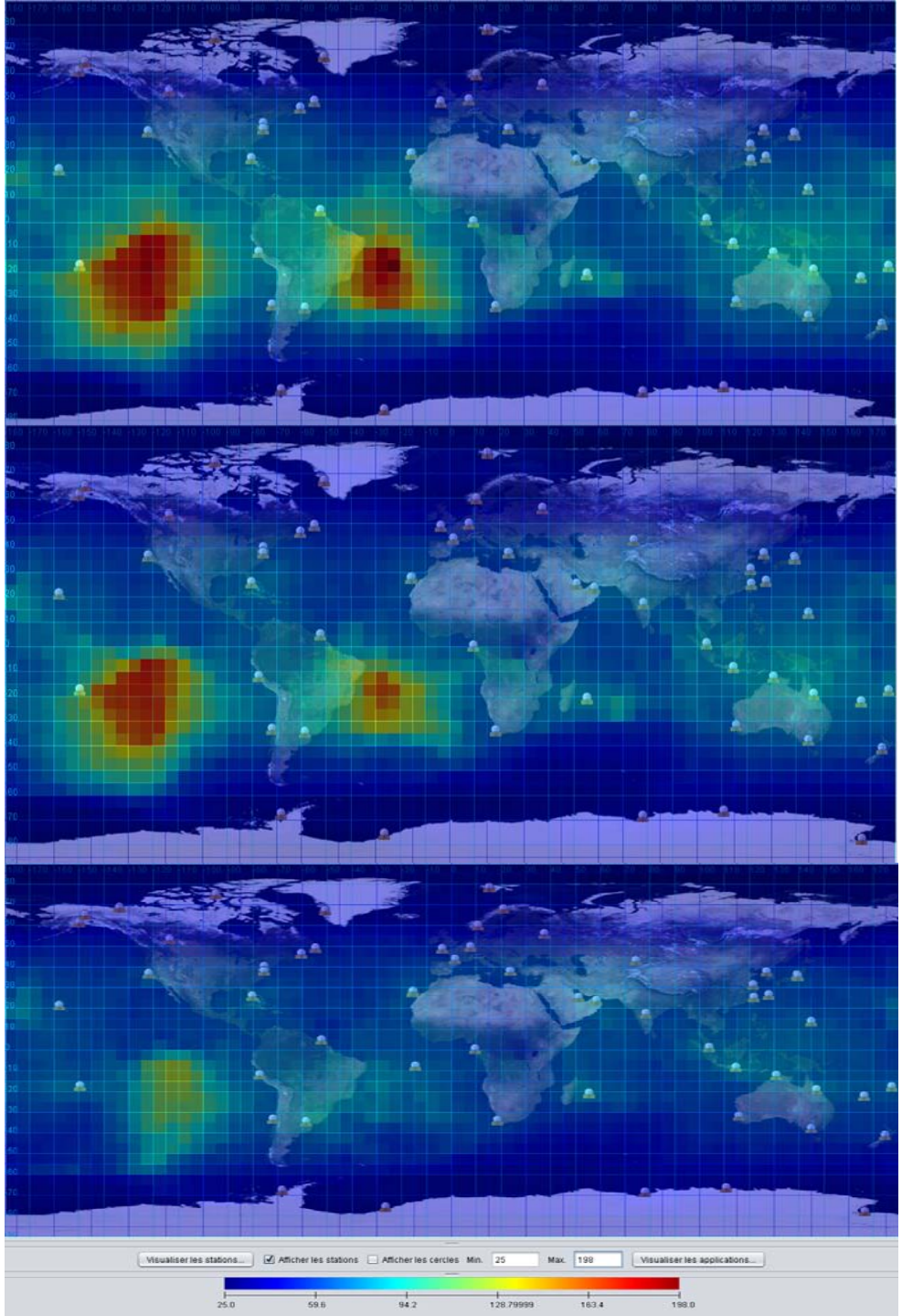
END 2012

- UPGRADE PROJECT COMPLETED
- 2 SATELLITES ADDED: METOP B & SARAL



CLS
COLLECTE LOCALISATION SATELLITES



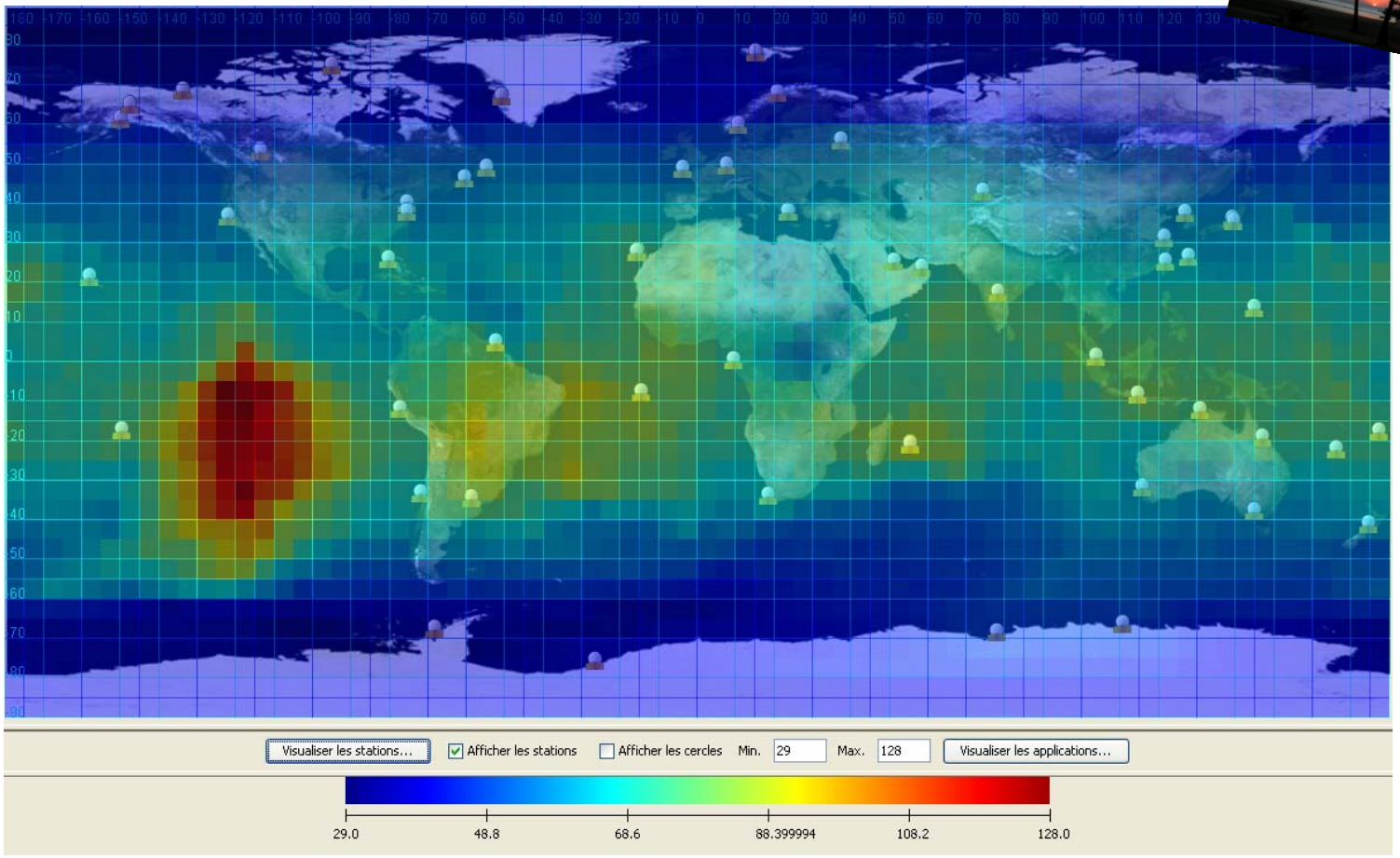
MARCH 2011

JUNE 2011

END-2012

THE SOUTHWEST PACIFIC

EXPECTED DATA TIMELINESS BEFORE INSTALLING AN EASTER ISLAND ANTENNA



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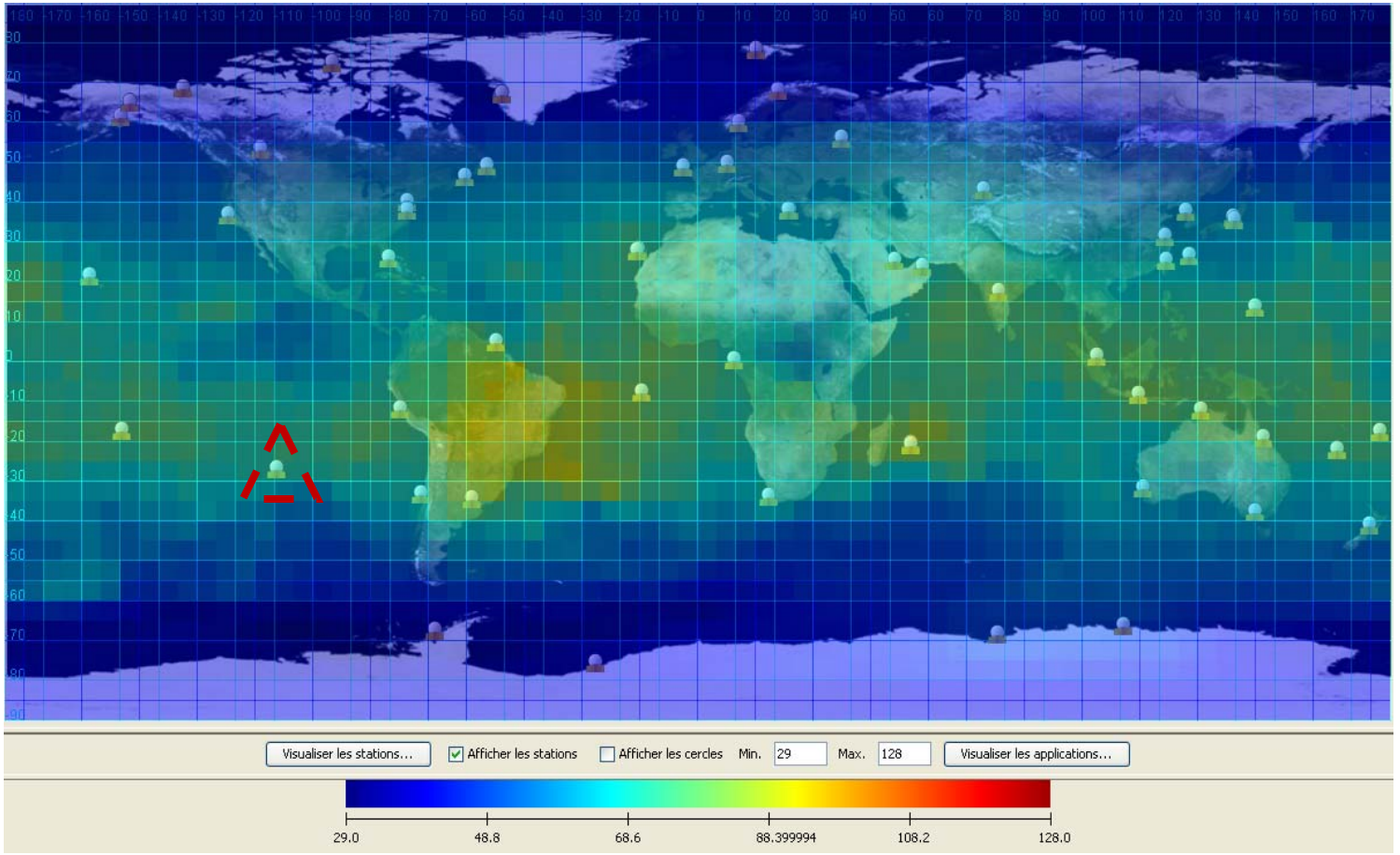
EXPECTED DATA TIMELINESS AFTER INSTALLING EASTER ISLAND ANTENNA



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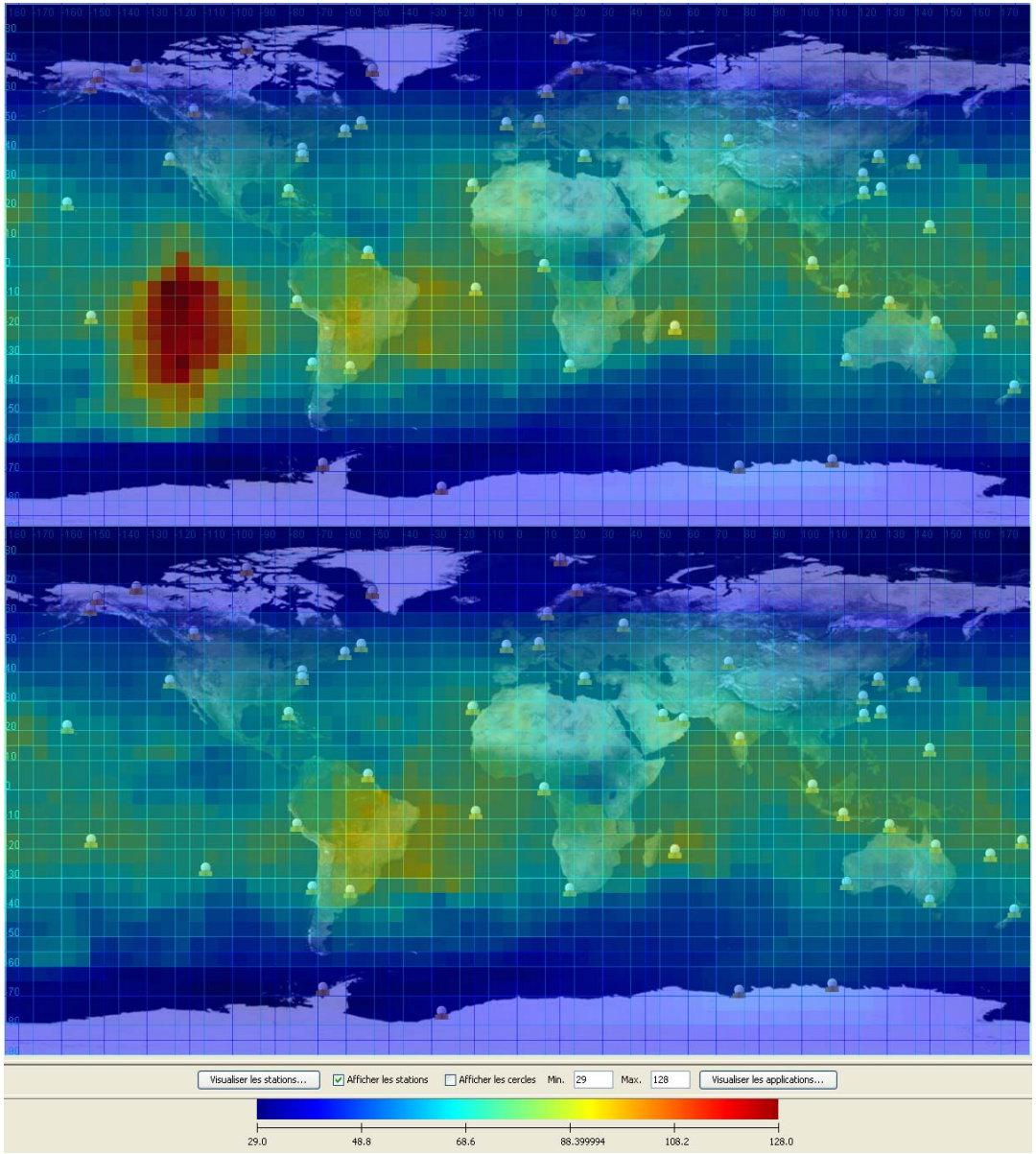
CLS
COLLECTE LOCALISATION SATELLITES



BEFORE EASTER ISLAND ANTENNA

AFTER EASTER ISLAND ANTENNA