WORLD METEOROLOGICAL ORGANIZATION

INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION (OF UNESCO)

DATA BUOY COOPERATION PANEL

DBCP-XXVII/Doc. 9.3
(30-Aug-11)

TWENTY-SEVENTH SESSION

ITEM: 9.3

GENEVA, SWITZERLAND
26-30 SEPTEMBER 2011

ENGLISH ONLY

GTS BULLETIN TIMELINESS REPORT

(Submitted by Jean Rolland, France and Bill Woodward, USA)

Summary and purpose of the document

This document provides information on the current status of the GTS delays encountered by observations received by both Argos and Iridium. It provides information on the present status and possible future improvements in the Argos network.

ACTION PROPOSED

The Panel will review the information contained in this report and comment and make decisions or recommendations as appropriate. See part A for the details of recommended actions.

Appendices: A. GTS Delays maps for May, June, July 2011

B. ARGOS Data Mean Disposal maps for March and June 2011, and mid-2012

-A- DRAFT TEXT FOR INCLUSION IN THE FINAL REPORT

9.3.1 Mr Jean Rolland (France) presented an overview of the pattern of delays for three months May to July 2011). The monthly maps were produced in collaboration with JCOMMOPS, focusing on delays. The delays are quite similar to those observed last year, with most of the data of drifting buoys now transmitting within 120 minutes. Iridium buoys continue to provide data within less than 60 minutes.

9.3.2 Mr Bill Woodward (USA) presented a summary of the ongoing and planned upgrades/improvements in the CLS real-time antenna network, organized by the three high priority DBCP regions of interest. Performance of the current and evolving/planned network is illustrated by maps generated by the CLS simulation tool that analyzes data delivery time performance in 5 deg X 5 deg squares around the globe. Argos data timeliness from the calculated CLS maps is quite consistent with the measured timeliness from the JCOMMOPS maps. Improvements made to the antenna network between March 2011 and July 2011 have resulted in calculated improvements in timeliness in the Eastern Equatorial Pacific of 20+ minutes, in portions of the Equatorial Atlantic of 20+ minutes, and in the South Atlantic of 30-40 minutes.

9.3.3 Considering the usefulness of this list, the Panel recommended that WMO/ID cross reference list on the web continues to be updated by the Technical Coordinator (***action; TC DBCP; ASAP***).

9.3.4 The Panel recommended to complete the DBCP monthly maps normally produced by JCOMMOPS for the end of 2010 and the beginning of 2011 (***action; TC DBCP; ASAP***).

9.3.5 Pending improvement of data timeliness in specified regions – i.e. target = average delays less than 60 minutes – , the Panel agreed to set aside some funds from its Trust Fund (amount to be decided by this Session) for use by Panel members to deploy Iridium drifting buoys in the areas of the South Pacific Ocean and the South Atlantic Ocean were the average delays are greater than 120 minutes (***action; DBCP members; DBCP-28***). Decision to use these funds shall be made by the Executive Board per formal requested submitted by Panel members to the Board.

9.3.6 The Panel recommended that the DBCP, and CLS perform regular (every 6 months) assessments of the global data buoy timeliness by jointly comparing the JCOMMOPS Delay Maps and the Argos Data Mean Disposal Time Maps for that time period. It therefore requested the Technical Coordinator to work with Panel members, the Task Team on Data Management, and CLS in the view to establish such a monitoring scheme, and to report on preliminary results, and proposed scheme at the next Panel Session (***action; TC DBCP; DBCP-28***).

-B- BACKGROUND INFORMATION

1 General timeliness review

1.1 The maps focusing on delays were produced for May, June, July 2011 with the metadata we had, as the WMO/ID cross reference list has not been updated regularly during the last year. They show the delays are quite similar to those observed by mid-2010.

1.2 There are only two areas, in the South Pacific Ocean (10°S- 30°S; 110°W-140°W) and in the South Atlantic Ocean (20°S- 35°S; 10°W-30°W), where delays are greater than 120 minutes.

1.3 Iridium buoys continue to provide data within less than 60 minutes most of the time. As recommended by DBCP-26, plans are underway for deploying ten Iridium drifters in the identified data timeliness problematic area in the South Pacific Ocean.

2. Argos Data Timeliness Update

2.1 Introduction

2.1.1 Improving the Argos data timeliness continues to be a high priority for CLS with a primary focus in the Indian Ocean, South Atlantic and Southwest Pacific regions. To this end, CLS is implementing an aggressive real-time antenna upgrade project with the goal of an optimized operational network of antennas that receives real-time data from all Argos equipped satellites. In support of this project, CLS has developed a simulation tool to analyze and display delivery time performance in 5 deg X 5 deg squares around the globe. The tool calculates the average time for an Argos platform to deliver its data, also called the "Argos Data Mean Disposal Time," as a function of the current and future Argos constellation and the real antennas of the network as well as planned antennas and their characteristics (locations, satellites tracked, elevation mask, average data delivery time, etc.).

2.1.2 The information below summarizes the ongoing and planned upgrades/improvements in the antenna network organized by the three high priority DBCP regions of interest. The results of these improvements are illustrated in the ARGOS DATA MEAN DATA DISPOSAL TIME MAPS in Appendix B. Ongoing comparison between these calculated maps and the JCOMMOPS average delay maps in APPENDIX A will enable the DBCP to regularly monitor the changes in the antenna network and to quantitatively measure the impact of the changes. CLS welcomes feedback from the DBCP on the real-time antenna upgrade project.

2.2 Indian Ocean Region

2.2.1 Efforts last year (2010) were focused on improving the performance of the existing antennas at Hyderabad and La Reunion Island. Also, in July 2010 CLS began receiving datasets from the EUMETSAT EARS antenna in Muscat, Oman for satellites N-15, N-16, N-17, N-18, N-19 and METOP-A. These actions have contributed significantly to improvements in the Argos data timeliness in the Indian Ocean. Additionally a USAF antenna in Al Udeid, Qatar was also connected during the past 12 months primarily to provide redundancy with the antenna in Muscat, Oman. This antenna in Al Udeid is currently experiencing technical problems and is not operational at the moment. Additionally, the installation in June 2011 of the antenna at McMurdo to collect METOP-A playback data (½ orbit) is expected to provide further improvement in the timeliness in this region. These improvements are confirmed in the JCOMMOPS GTS DELAYS MAPS for MAY – June 2011 in Appendix A.

2.2.2 Further, in response to the continuing requests from the DBCP to improve data timeliness in the Indian Ocean, CLS will upgrade the Muscat and La Reunion stations in 2011/2012 with the new Kongsberg receivers which will collect data from all the NOAA satellites, from METOP-A (and beginning next year, from METOP-B) and also next year from SARAL. The station at Davis (Antarctica), operated by the Australian BOM is also scheduled to be similarly upgraded and is expected to have a positive impact on the data timeliness in the southern Indian Ocean. Figure C, in Appendix B, represents the expected data timeliness resulting from these improvements. CLS will work closely with the DBCP, in particular Meteo France, to monitor and measure the impacts of these improvements as they are implemented.

2.3 South Atlantic region

2.3.1 Data timeless in high latitudes has already begun improving with the addition of two new stations in Antarctica (in yellow on Figure C in Appendix B):

- The Halley regional antenna operated by the British Antarctic Survey.
- The Mc Murdo global antenna for METOP-A operated by NASA/NOAA.

2.3.2 Figures A, B & C in Appendix B are global snapshots in time of the calculated Argos Data Mean Disposal Times that illustrate the evolving improvements in the South Atlantic Region. The three time periods are:

-March 2011
-June 2011
-Mid-to-late-2012: The time period when all HRPT antenna improvements are completed

2.4 Southwest Pacific Region

2.4. Improvements in the performance of the existing antenna in Tahiti have contributed to some extent in improving the data timeliness in this region. This antenna in Tahiti is also scheduled to be upgraded with the Kongsberg receiver in 2011/2012. It is expected that this will improve timeliness even more, as illustrated by comparing Figures B and C in Appendix B.

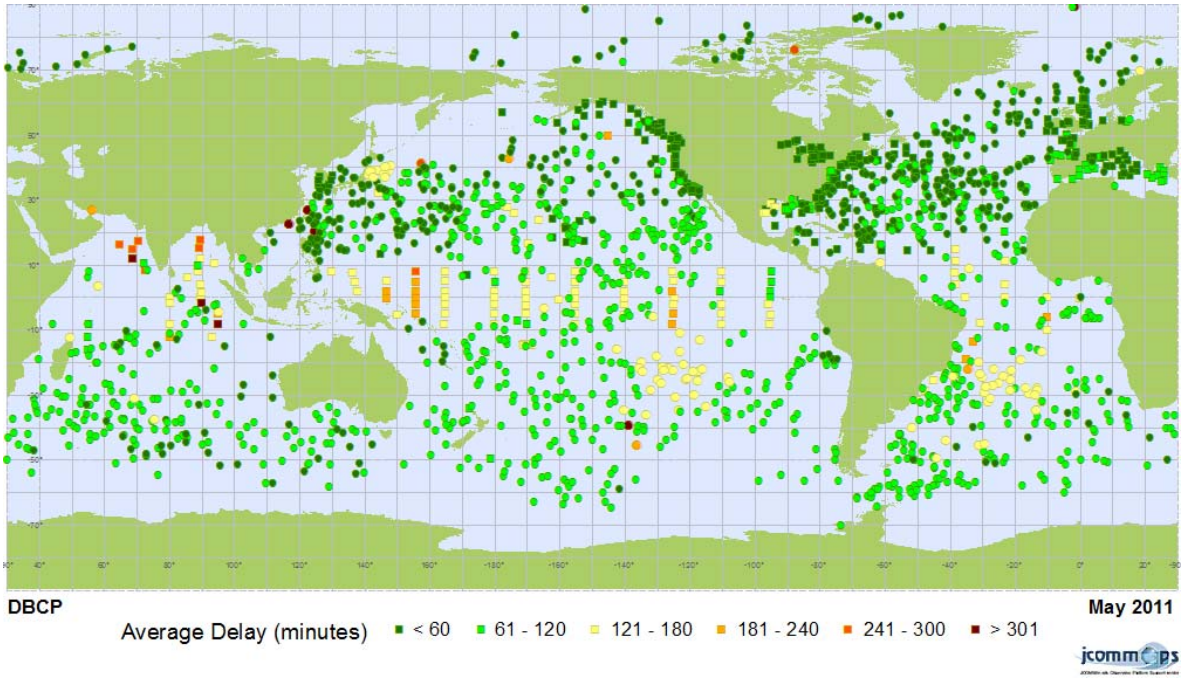
2-4-2 Finally, the effect of installing an antenna on Easter Island in the southwest Pacific on the data timeliness in this region has been examined. Figures D and E, in Appendix B, illustrate the calculated timeliness before and after installing an antenna on Easter Island. Note the significant improvement in this region. (please note carefully that there is a difference in the color scale between Figure A,B,C and Figures D and E). Installing an antenna on Easter Island is not currently in the budget of the Argos Real-Time Antenna Upgrade Project.

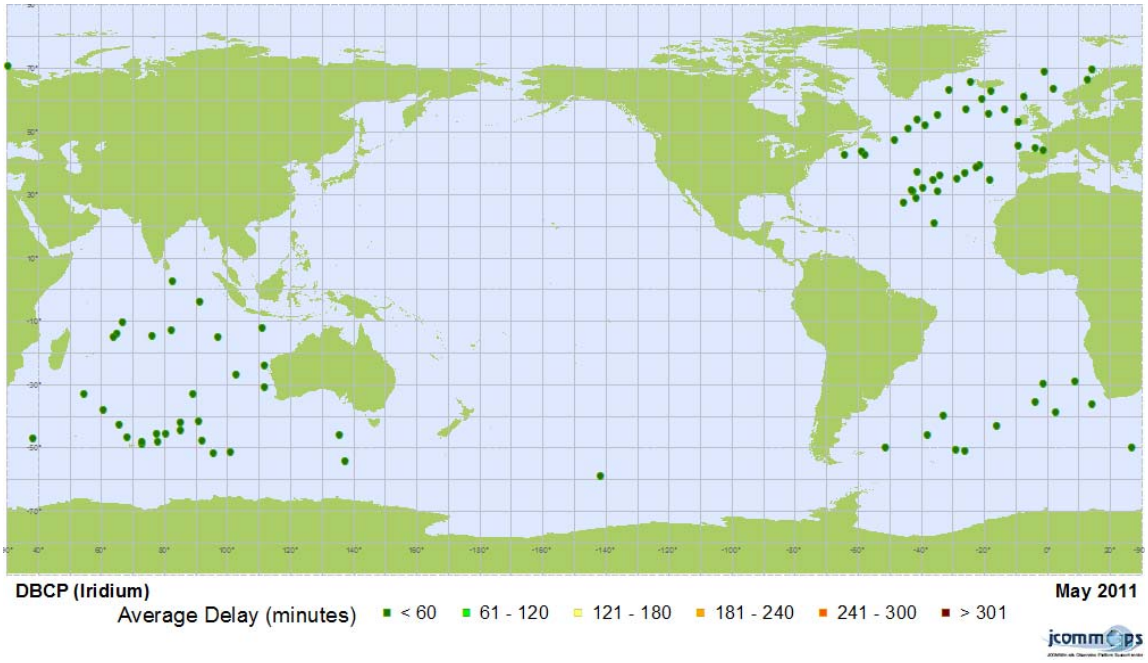
_____

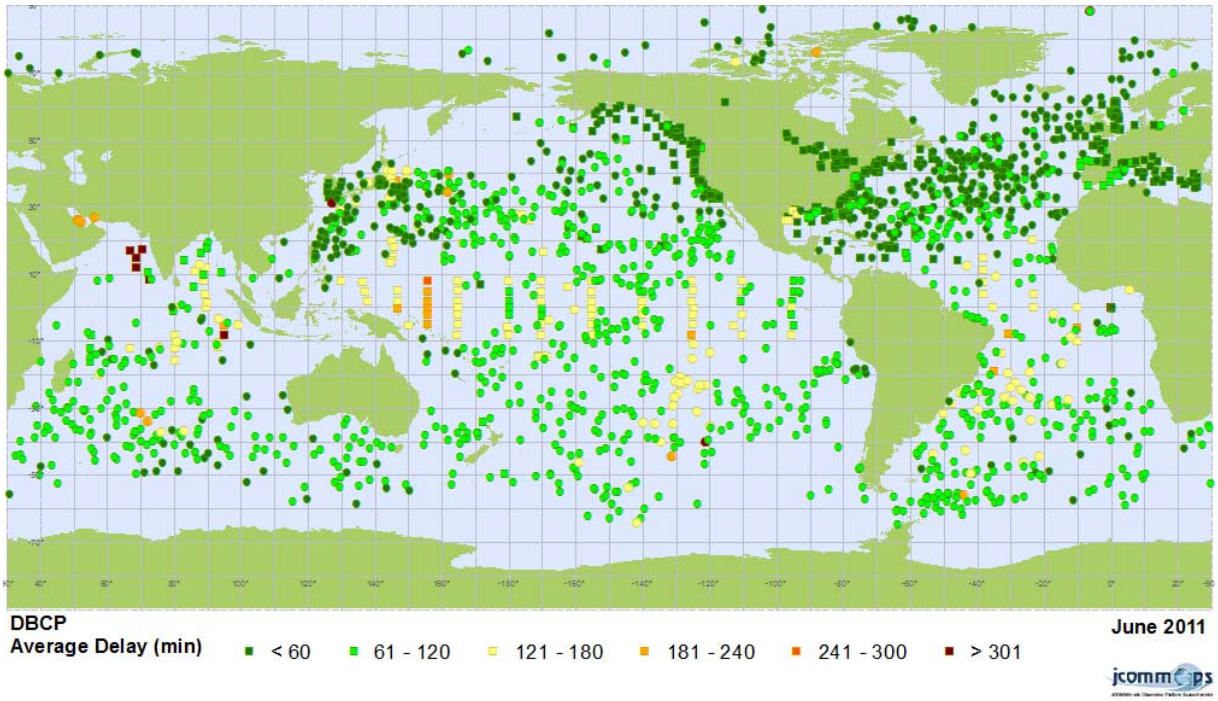
Appendices: 2

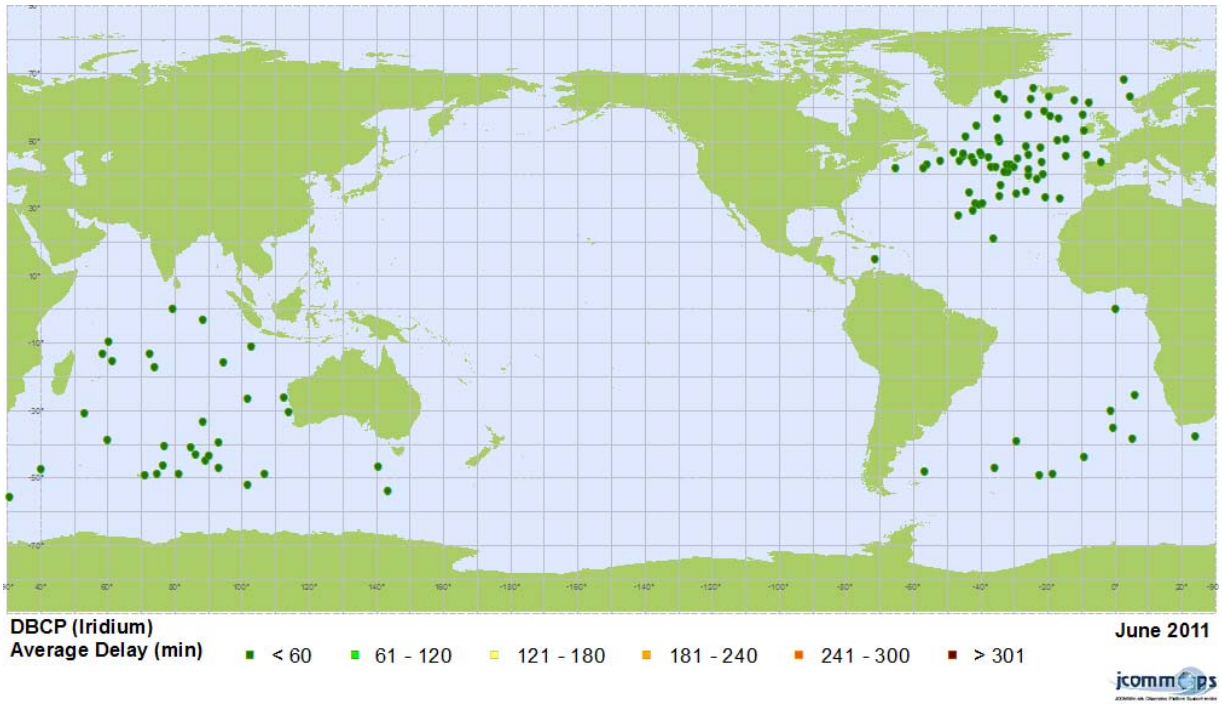
APPENDIX A

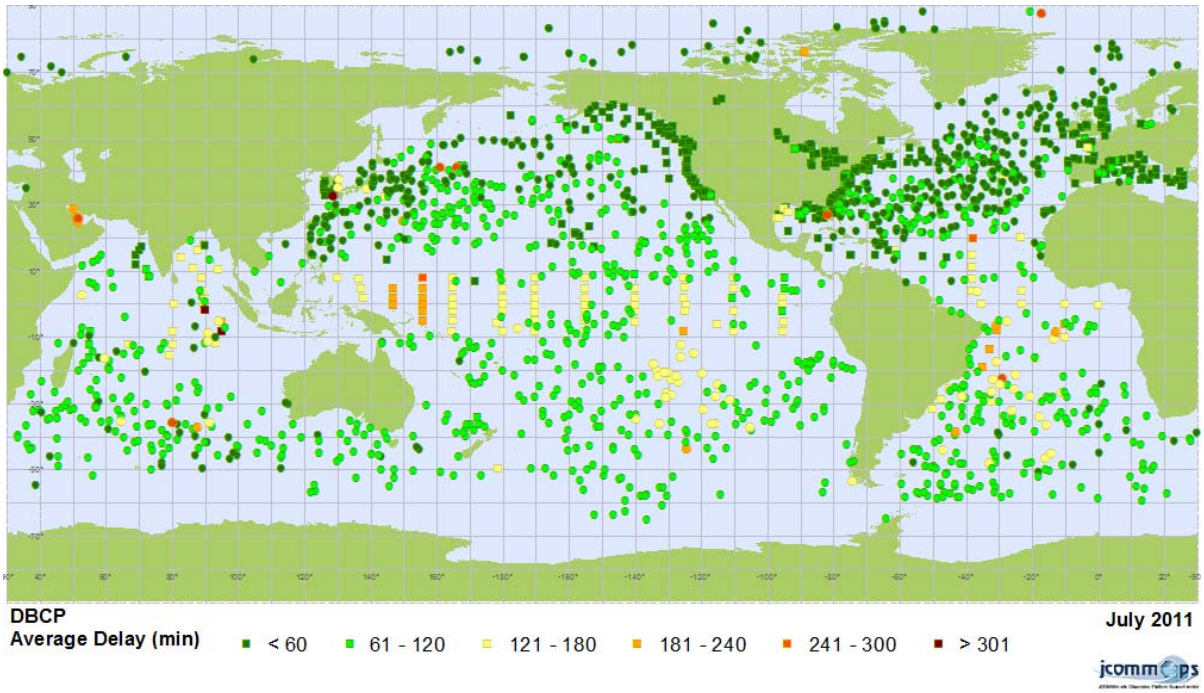
GTS DELAYS MAPS

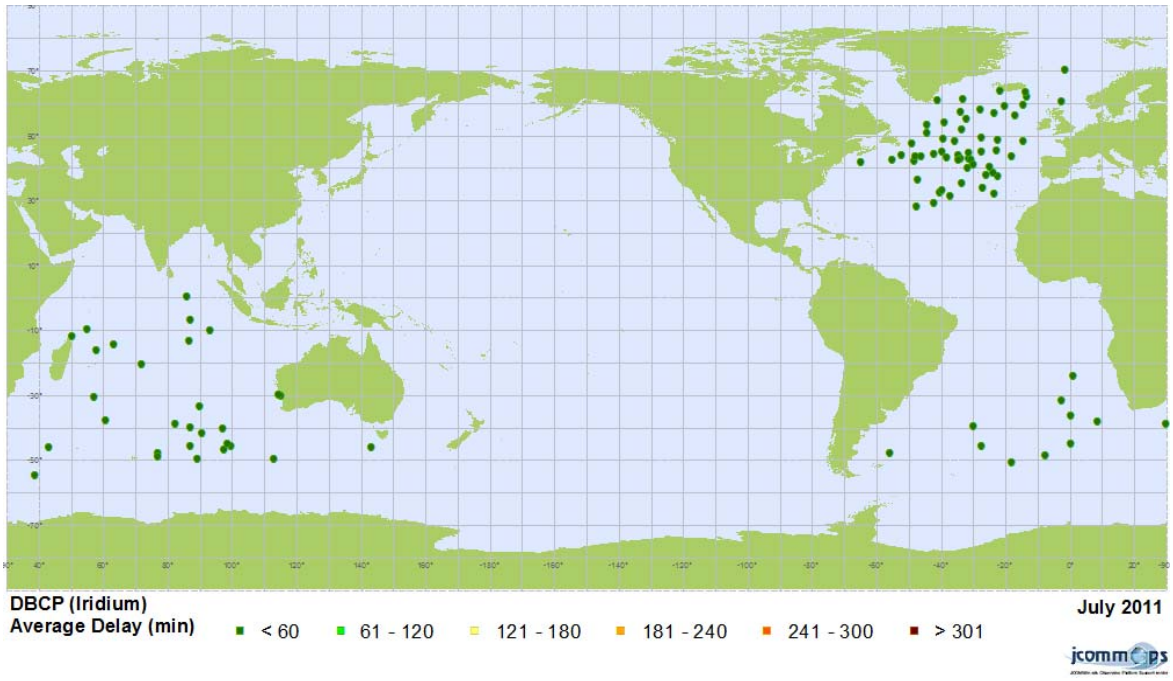





DBCP
Average Delay (min)
< 60
61 - 120
121 - 180
181 - 240
241 - 300
> 301
June 2011
jcomm ops


DBCP (Iridium)
Average Delay (min)
< 60
61 - 120
121 - 180
181 - 240
241 - 300
> 301
June 2011
jcomm ops


DBCP
Average Delay (min)
< 60
61 - 120
121 - 180
181 - 240
241 - 300
> 301
July 2011
jcommops


DBCP (Iridium)
Average Delay (min)
< 60
61 - 120
121 - 180
181 - 240
241 - 300
> 301
July 2011
jcommops

APPENDIX B

ARGOS DATA MEAN DISPOSAL TIME FIGURES

March 2011 : This calculation takes into account improvements on METOP-A HRPT coverage (more stations compatible and communication on descending and ascending orbits).

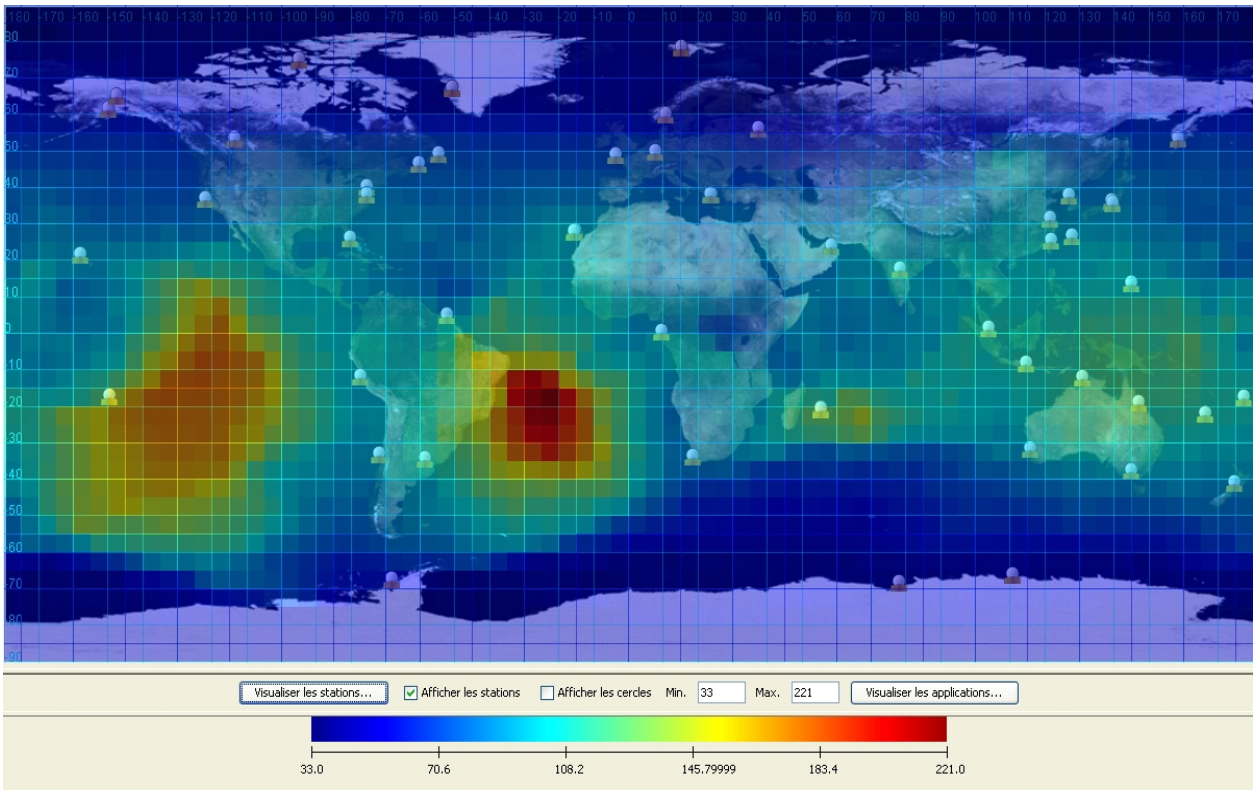


Fig.A Argos Data Mean Disposal Time March 2011

June 2011 : This calculation takes into account:

- 3 stations upgraded : RSL Lannion already compatible with METOP-A before the upgrade, LML Lima still in the exclusion area = no METOP-A HRPT data and BLL Bali, which burned = no visible impact of the upgrade project for the moment
- 1 new global station for METOP-A : McMurdo in Antarctica very effective because data are sent from Antarctica to CLS in less than 20 minutes.(in yellow on Fig. C)
- The Halley regional antenna operated by the British Antarctic Survey (in yellow on Fig. C)

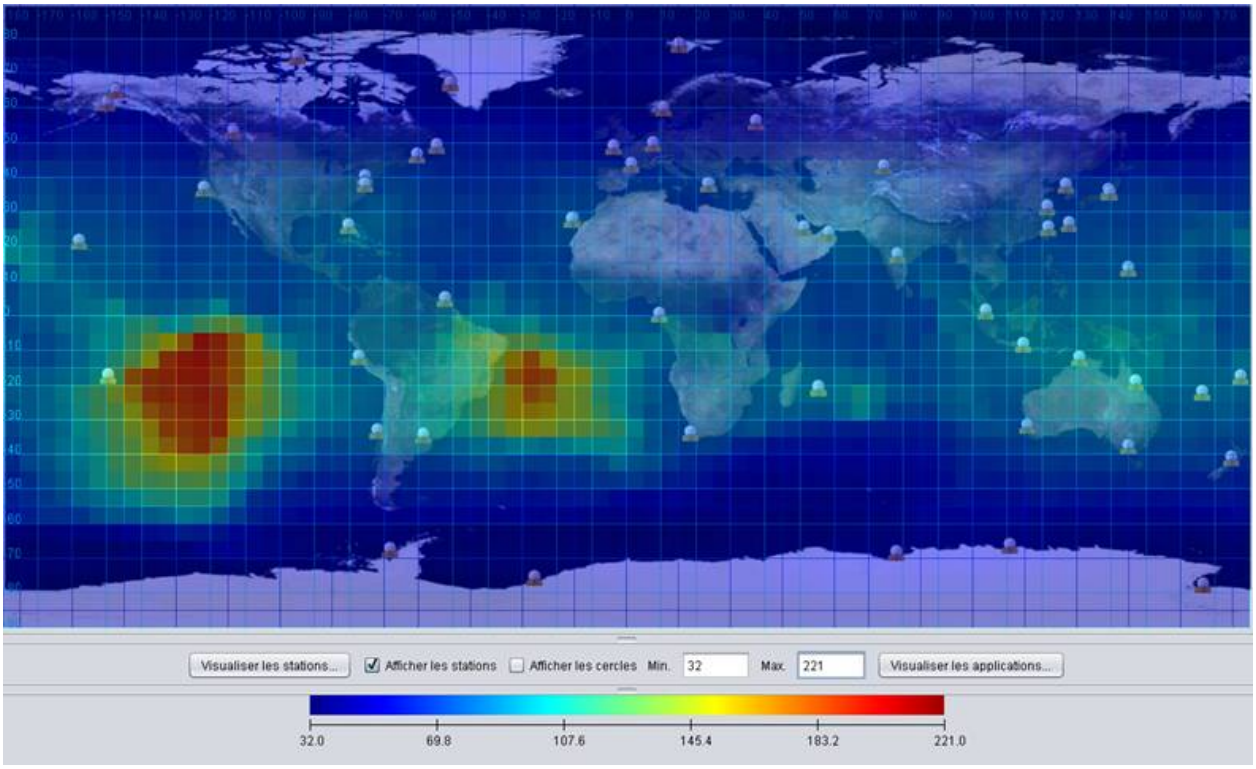


Fig.B Argos global Data Mean Disposal Time June 2011

Target Date of mid 2012: This calculation takes into account all of the actions of the Argos Real-Time Antenna Upgrade Project. The following are the specific actions that affect the South Atlantic region:

- Two new stations: one on Ascension Island (United Kingdom) and another in Cape Town (South Africa) will be added in the Argos real-time stations network in 2012. Both antennas are in AIT phase and contacts are on the run with the installation sites (in red on figure C).
- Two existing stations in Antarctica: Davis operated by The Bureau Of Meteorology (Australia) and Rothera operated by the British Antarctic Survey (United Kingdom), will be upgraded in 2012 to be capable of acquiring data from NOAA, METOP and SARAL satellites (in white on figure C).

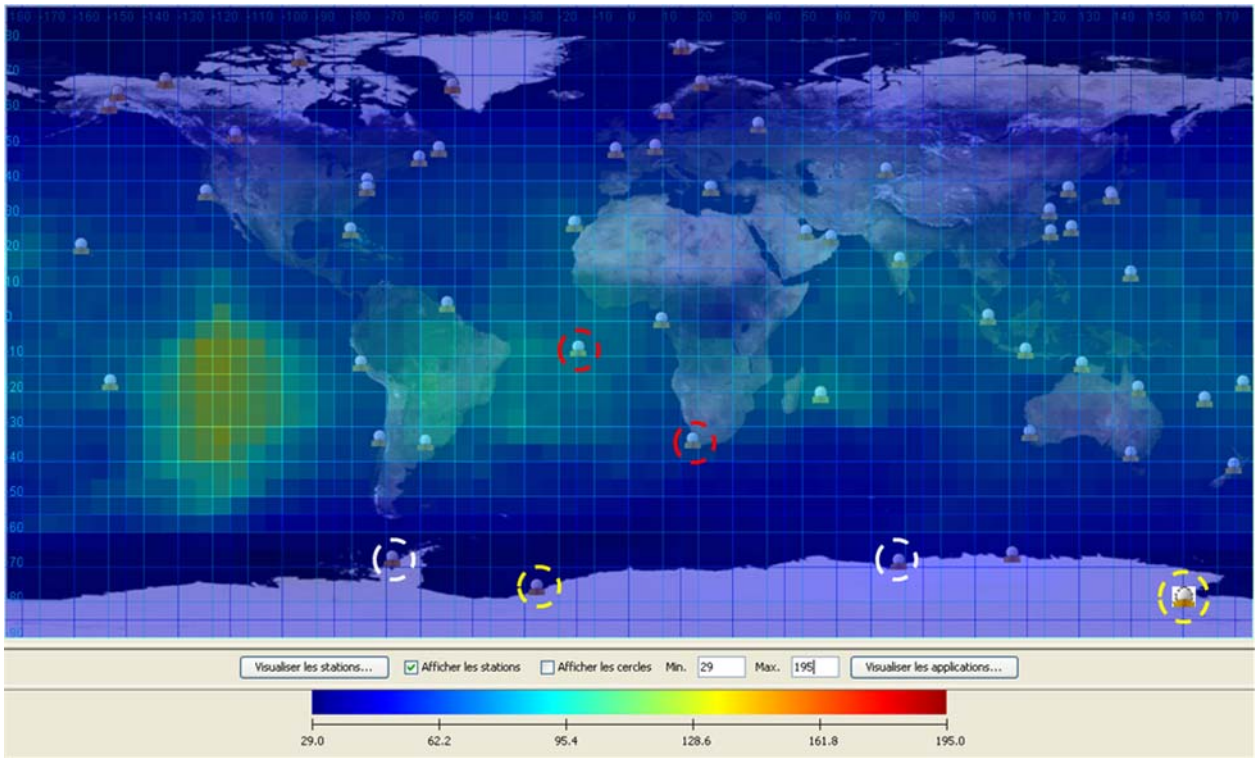


Figure C: Expected global data timeliness after all HRPT improvements

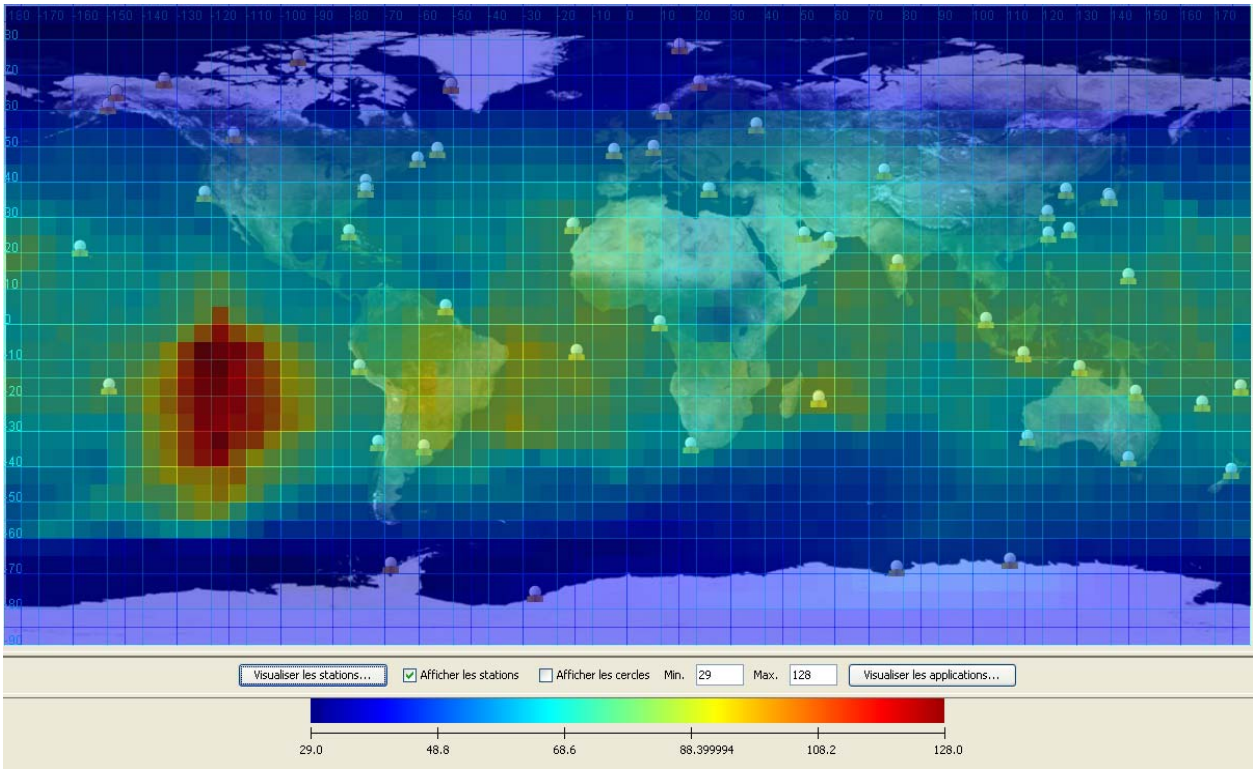


Figure D: Expected data timeliness before installing Easter Island antenna

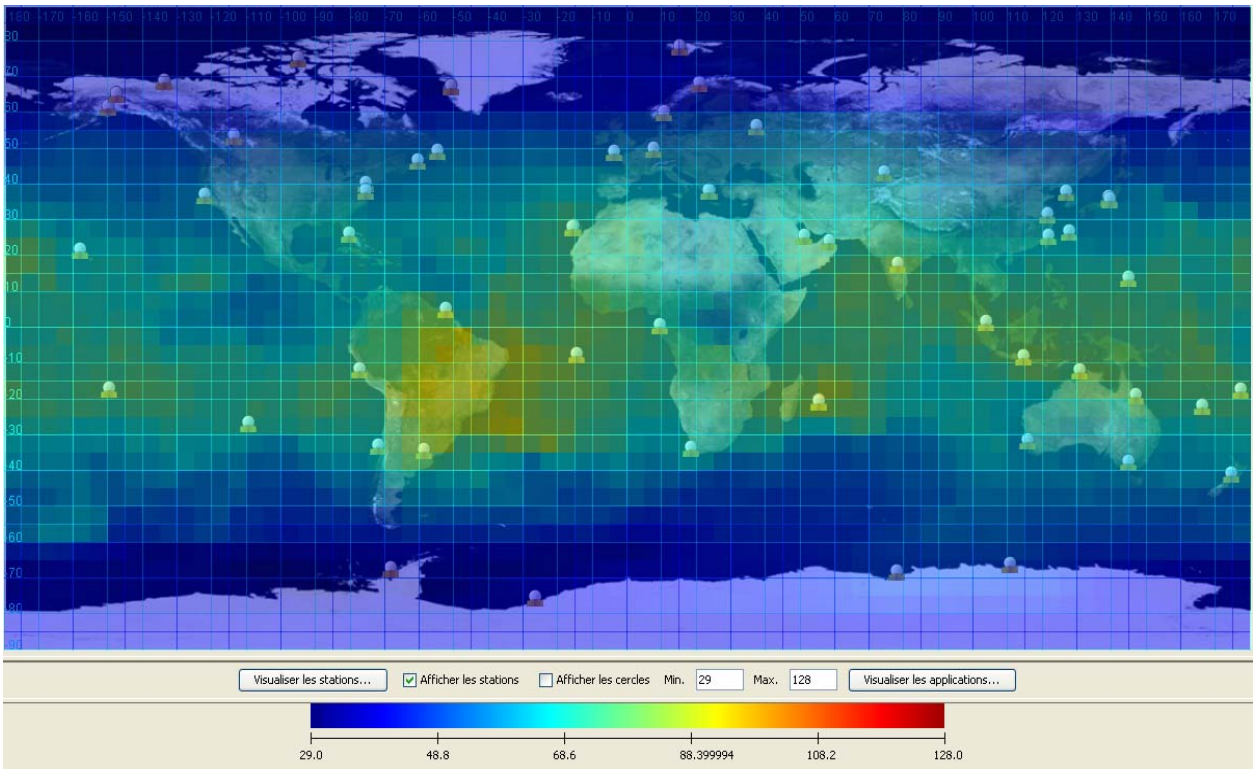


Figure E: Expected data timeliness after installing Easter Island antenna