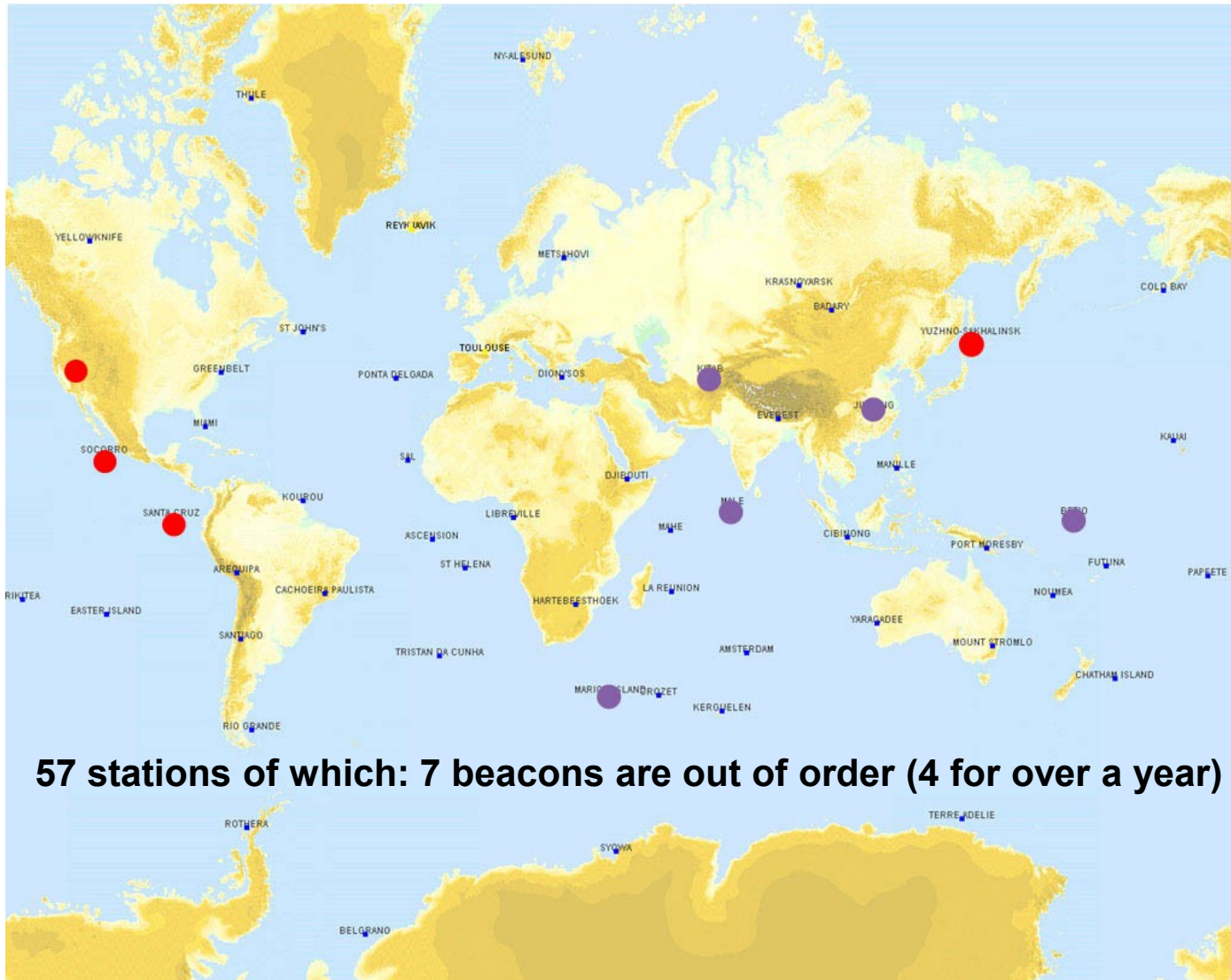


# DORIS NETWORK STATUS

**APRIL 2013**

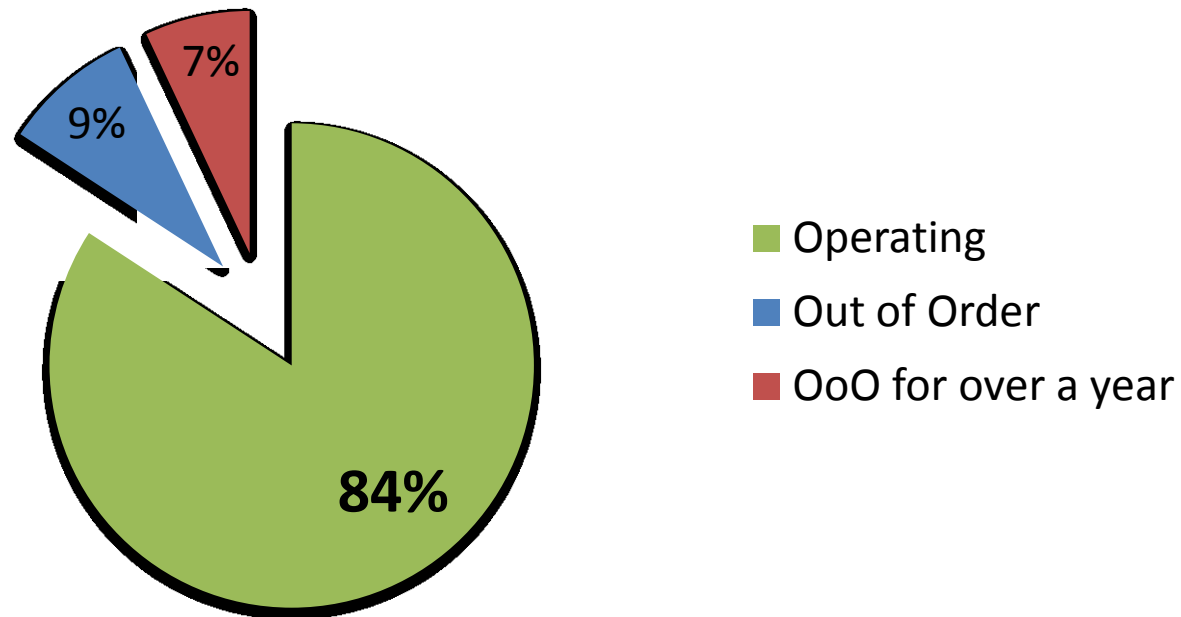


# OPERATIONNAL STATUS



**57 stations of which: 7 beacons are out of order (4 for over a year)**

## Current status of the 57 stations



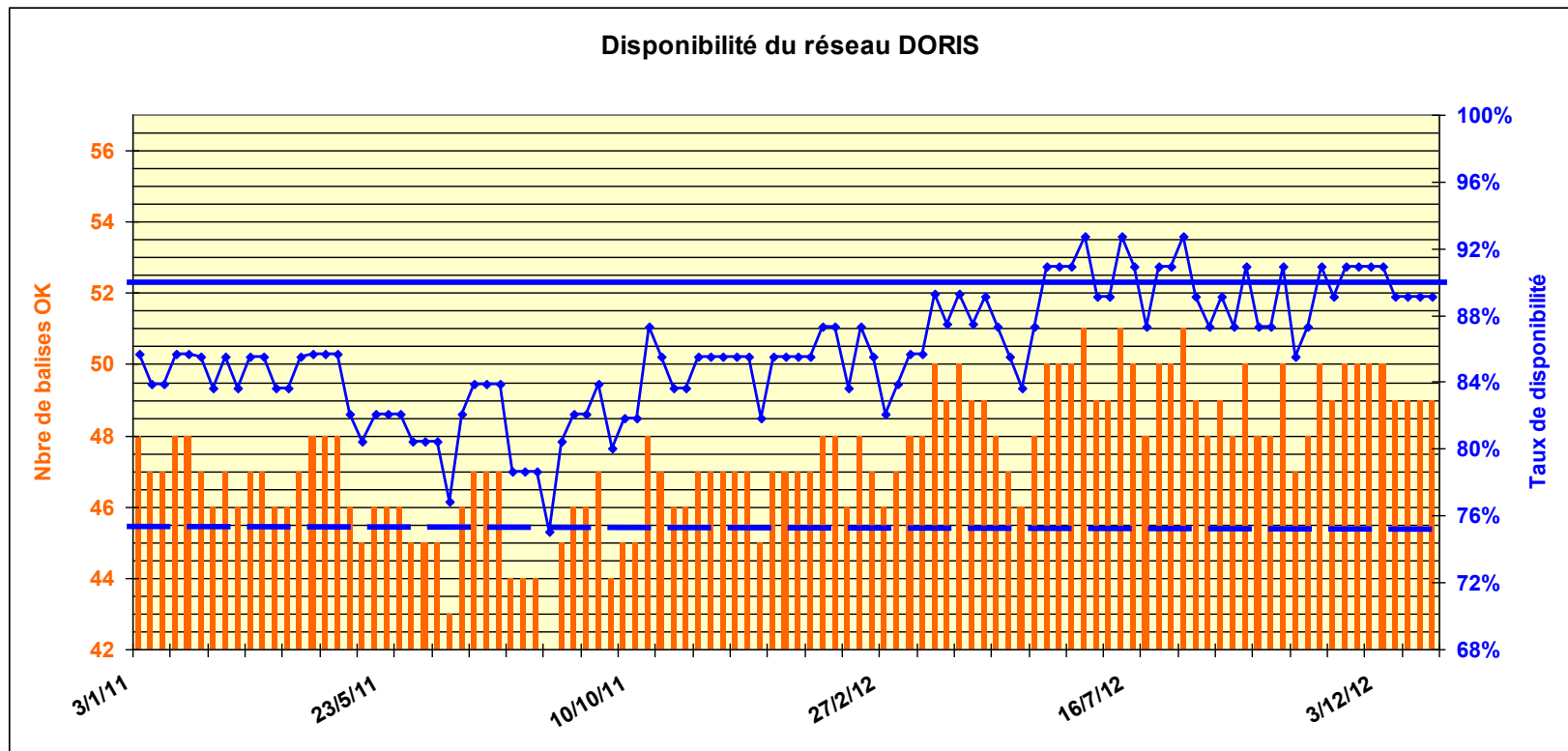
### Out of Order for over a year:

Yuzhno-Sakhalinsk (11/2005), Santa Cruz (06/2009), Socorro (10/2009), Monument Peak (02/2010)

# NETWORK AVAILABILITY



- RESULT OF THE JOINT EFFORT OF CNES AND IGN
- FUTUNA, TRISTAN, PORT-MORESBY BACK TO OPERATION
- INCREASING USE OF THE BEACON REMOTE CONTROL SYSTEM (33/41)



From CNES/SALP data

# MAINTENANCE HARD SPOTS

- **ABOUT 5 ON-SITE INTERVENTIONS PER YEAR**  
=> **ON AVERAGE EACH SITE IS VISITED EVERY 10 YEARS**
  
- **VARIOUS TYPES OF EVENTS:**
  - Equipment failure
  - Environment issues: deterioration (signal disruption), interferences...
  - Host agency request for moving: site closing, works...
  - Administrative issues: customs clearance, frequency clearance renewal...
  
- **HOST AGENCIES USE ITS BEST EFFORTS BUT ITS REACTIVITY DEPENDS ON:**
  - Current Availability
  - Interest and Concern about DORIS
  - Quality of linkages (more or less recent visit, change of teams...)
  - Administrative delays (customs officers, lawyers)
  - Communication difficulties (remote areas)

# NETWORK EVENTS (1/2)



2012	Station		Event
January		<b>All</b>	<b>New coordinate and velocity set (DPOD/ITRF2008)</b>
February	RIMB	<i>Rikitea</i> <i>Sal – Réunion - Kitab</i>	<i>Beacon replacement</i> <i>Remote control system installation</i>
March	REZB	<b>All</b> <i>Reykjavik</i> French West Indies	<b>New set of site logs (major data updating and revision)</b> <i>Beacon replacement</i>
	RIRB	Rio Grande	<b>Reconnaissance in Guadeloupe and Martinique (IGS co-location)</b>
			Antenna replacement (position unchanged)
April	FUUB	<b>Futuna</b>	<b>Major renovation + local tie survey (new GNSS station 'FTNA')</b>
	ADGB	<i>Terre Adélie</i>	<i>Equipment upgrade (3.1) + Maser and antenna replacement</i>
May	GRFB	<b>Greenbelt</b>	<b>Renovation (antenna raising and equipment replacement)</b>
	EVEB	<i>Everest</i>	<i>Remote control system installation</i>
June	TRJB	<b>Tristan da Cunha</b>	<b>Major renovation + local tie survey</b>
	MEUB	<b>Metsähovi</b>	<b>Renovation + local tie survey (new REGINA station)</b>

# NETWORK EVENTS (2/2)



2012-13	Station		Event
August	MOSB	<b>Port Moresby</b>	<b>Renovation (antenna raising and equipment replacement)</b>
September	DJIB	<i>Djibouti</i>	<i>Beacon replacement + remote control system</i>
October	JIVB	<b>Jiufeng</b>	<b>Renovation + local tie survey (new REGINA station)</b>
December	MAIB	<b>Mahé</b>	<b>Antenna moving (40m) Beacon 3.2</b>
February	PAUB	<i>Papeete</i>	<i>Beacon replacement (3.1)</i>
	KRWB	<i>Kourou</i>	<i>Tracking Oscillator replacement</i>
	CHAB	<b>Chatham Island</b>	<b>Reconnaissance (site going to be closed in July)</b>
April		<b>Nicaragua</b>	<b>Reconnaissance with a view to installing a new station</b>

# NETWORK EVOLUTION

## ■ SHORT RUN (NEXT 6 MONTHS)

- St John's: renovation, local tie survey (new GNSS station)
- Grasse: renovation, local tie survey
- Syowa: antenna replacement

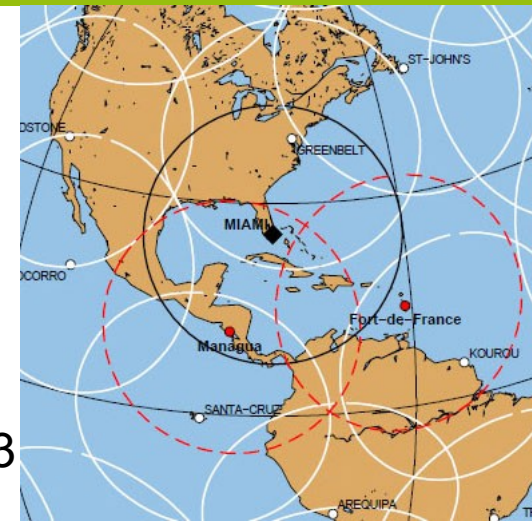
## ■ LATER

- Goldstone: new station in place of Monument Peak
- Socorro: major renovation (equipment, antenna moving...)
- Chatham: station re-location
- Hokkaido: new station in place of Sakhalinsk, co-location GNSS+VLBI
- Miami: definitive shutdown (interferences with TV-mobile)
- Kitab: major renovation (reconnaissance on September)
- Easter Island: major renovation



## ■ NEW STATIONS

- Fr. West Indies : installation planned first half 2013
- Chichijima: installation planned second half of 2013
- Nicaragua: reconnaissance in April, co-location GNSS
- Korea: under negotiation with KASI, co-location GNSS+SLR+VLBI
- Wake island (Marshall): under consideration
- Tamanrasset: lying dormant
- Riyadh: abandoned (frequency clearance default)



# GEODESY SECTION

# IGN RESPONSABILITIES SUMMARY



## ■ DORIS REFERENCE POINTS

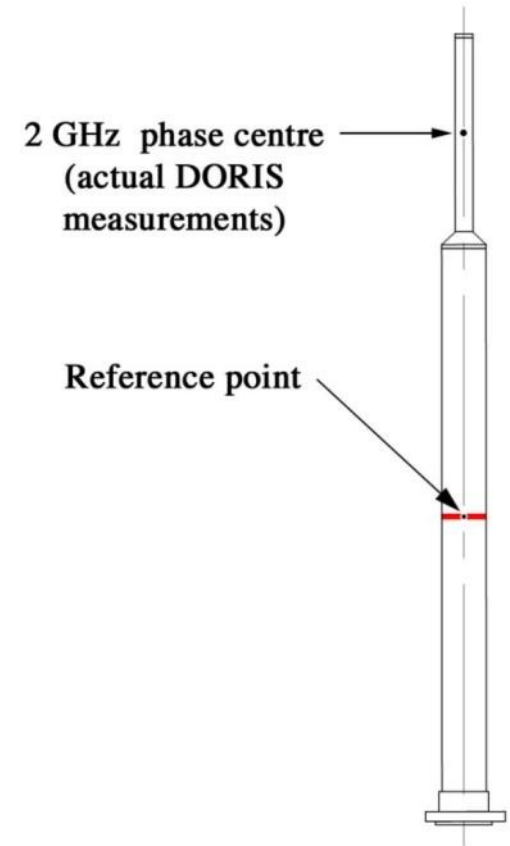
- Antenna Reference Point: intersection of the antenna axis and the red disk
- Mark under the antenna = geodetic print of DORIS

## ■ DORIS NEEDS

- 2GHz and 400MHz phase centers on a same vertical axis
- Coordinates of the antenna reference (ARP)
- Tie vectors (DORIS to other local geodetic points)
  - Mark, GNSS, SLR, VLBI, tide gauge...

## ■ DORIS GOVERNING BOARD DECISION (23/01/12)

- Favorable context with REGINA : high precision local tie surveys
  - Objective : submillimetric tie vectors precision
- => Big surveying equipment to forward

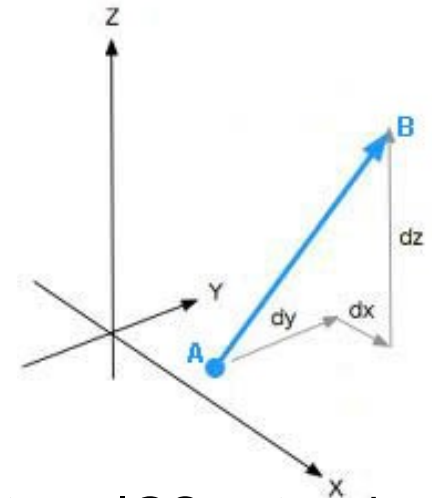


- **ALL COORDINATES AND VELOCITIES ARE DETERMINED EVERY NEW ITRF SOLUTION (DPOD SOLUTION)**

- Extracted from the ITRF release or the DPOD release
- Using time series of station positions

- **BETWEEN 2 ITRF RELEASES**

- Renovation: tie vector with the former reference point
- New station: tie vectors with available points in the vicinity or IGS network

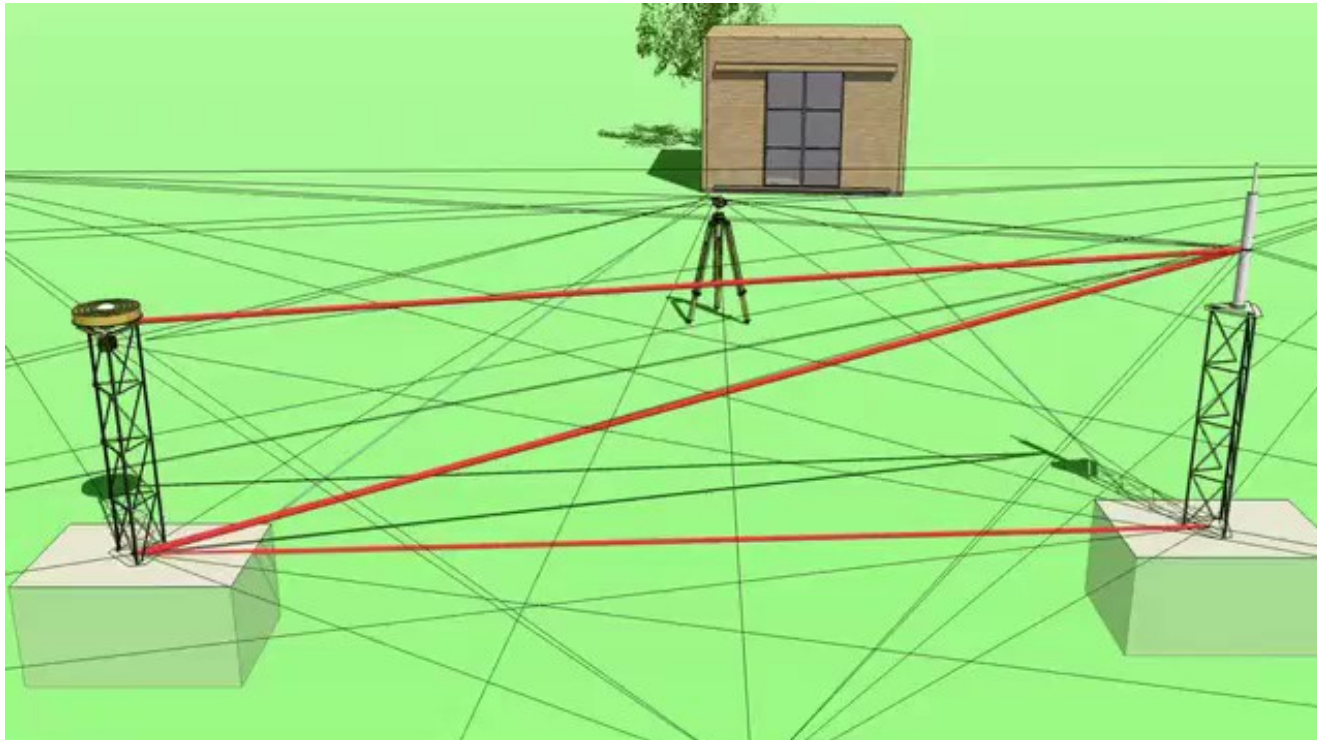


- **THUS, DORIS IS A FULLY POSITIONING SYSTEM**

- GNSS is only used in the case of new station

## ■ CONVENTIONAL METHOD

- Combining terrestrial measurements of angles, distances and height differences
- Computing differential coordinates expressed in a topometric frame
- Referencing into a global frame (ITRF)



## ■ ALREADY DONE:

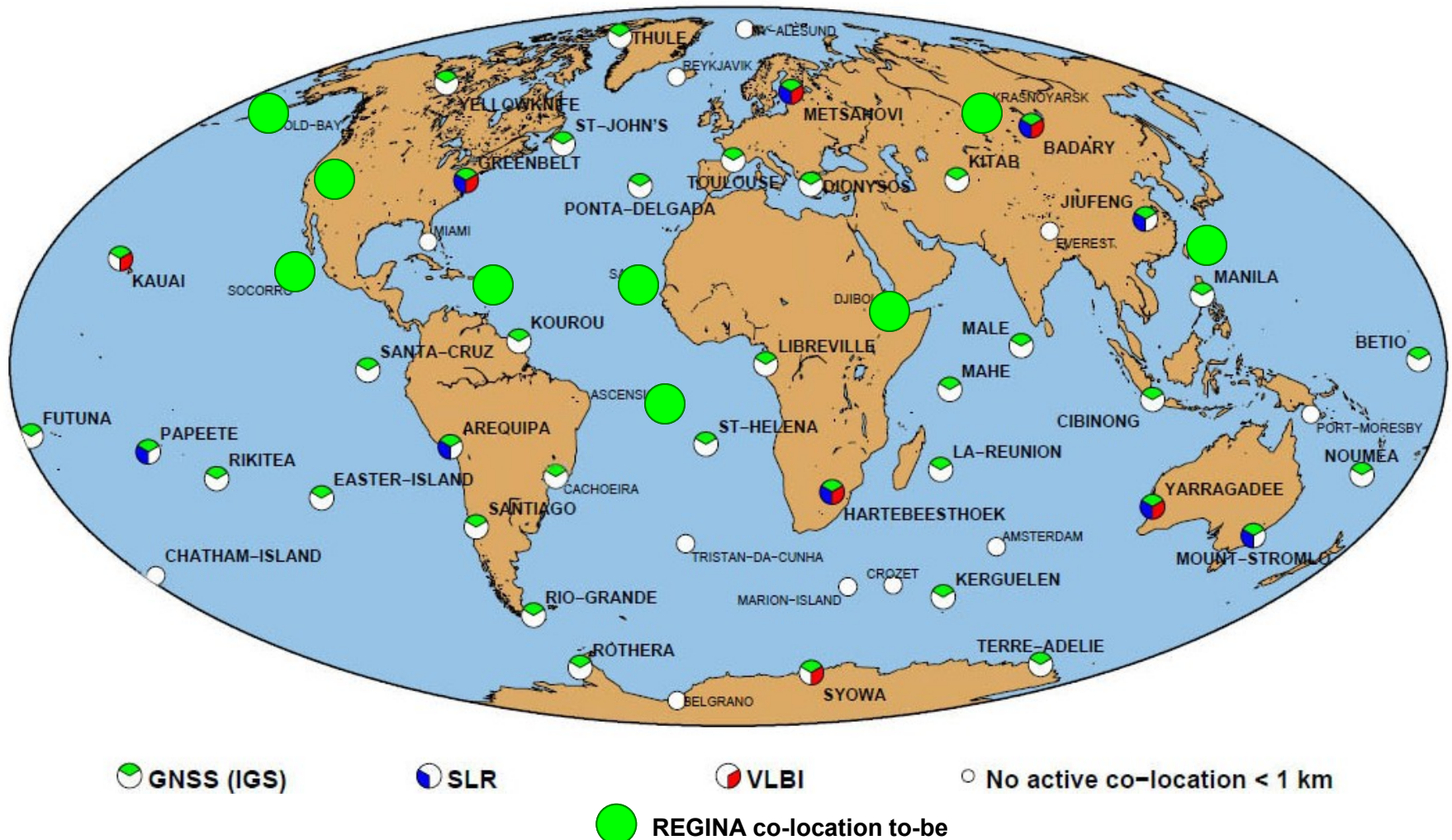
- ROTHERA, February 2011
- KOUROU, February 2011
- DIONYSOS, May 2011
- RIKITEA, July 2011
- PAPEETE, July 2011
- *FUTUNA, April 2012*
- *TRISTAN DA CUNHA, June 2012*
- *METSAHOVI, June 2012*
- *JIUFENG, October 2012*
- *MAHE, December 2012*

## ■ CO-LOCATION SURVEY REPORTS AND SINEX FILES AVAILABLE ONLINE

- [http://itrf.ign.fr/local\\_surveys.php](http://itrf.ign.fr/local_surveys.php)

# CO-LOCATIONS

## ■ DORIS STATIONS CO-LOCATED WITH OTHER IERS TECHNIQUES



# IGN-SGN CONTRIBUTION TO ITRF2013



- **ADDITIONAL CO-LOCATION SURVEYS: RIYADH 2012, GRASSE 2013**
- **RE-COMPUTING OF ALL CO-LOCATION SURVEYS CARRIED OUT BY IGN IN THE PAST**
  - Re-processing of GPS observations using:
    - New softwares (Bern, LGO)
    - Absolute calibration models of GPS antennas
    - Final IGS orbits
  - Using standard computation strategy
  - Re-qualifying of all tie vectors
  - SINEX files cleaning and completing
- **ITRF WEB SITE OVERHAUL**
  - Website formerly hosted and maintained by the Geodesy Research Laboratory of IGN (LAREG)
  - Transfer: IGN-SGN now in charge of the maintenance and evolution of the ITRF website
  - New database; new tools; website rebranding
  - Local tie survey metadata, tie vectors, SINEX files available
  - Objective: end of 2013 (analysis closed, development from June)



# OTHER ACTIONS IN PROGRESS



- **PARTICIPATION IN IERS WORKSHOP ON LOCAL SURVEYS AND CO-LOCATIONS (PARIS, MAY 21-22, 2013)**
  - Location of reference points by indirect methods (Session 1)
  - Co-locations surveys: IGN method presentation (field observations and computing)
- **EQUIPPING SITES WITH GEODETIC CONTROL POINTS IN ORDER TO MONITOR THE MONUMENTATION STABILITY**
  - Grasse chosen as experimental site
  - Substructure (pillars...) is already built
  - Observations campaign every summer

⇒ specification, method assessment, cost evaluation
- **DORIS NETWORK DATABASE OVERHAUL**
  - Taking into account IDS or DORIS users requests
  - Making easier various outputs: maps, plots, lists, files...
  - DORIS station identification sheets available on the web
  - Analysis to be done before the end of 2013, into service at the end of 2014

- **DORISMAILS FOLLOWING EVERY ANTENNA CHANGING OR MOVING**
  - Coordinates of the new reference point + installation characteristics
  
- **REGULARLY UPDATED SITE LOGS**
  - <http://ids-doris.org/network/sitelogs.html>
  
- **DORIS INTERNAL FILE (EVERY 6 MONTHS)**
  - Successive antenna positions on the same site
  - [ftp://doris.ign.fr/pub/doris/cb\\_mirror/stations/DORIS\\_int\\_ties.txt](ftp://doris.ign.fr/pub/doris/cb_mirror/stations/DORIS_int_ties.txt)
  
- **CO-LOCATION SURVEYS REPORTS AND SINEX FILES**
  - [http://itrf.ensg.ign.fr/local\\_surveys.php](http://itrf.ensg.ign.fr/local_surveys.php)