

International Doris Service

# IDS REPORT 2010

*GGOS Bureau for Networks &  
Communications*

*San Francisco, U.S.A.*

*December 15, 2010*



## Outline

1. **Satellite Constellation Status.**
2. **Network Status.**
3. **DORIS Special Issue (Adv. Space Research).**
4. **New IDS Citation.**

*Report by Frank Lemoine, with contributions from Jérôme Saunier, Pascale Ferrage, Pascal Willis, Carey Noll,*

# DORIS Constellation Status - Current Missions



- **CRYOSAT-2 (ESA): 717 km, 92°** April 8, 2010 → end 2013, (DGXX + LRA)
- **JASON-2 (CNES/NASA): 1336 km, 66°** June 2008 → end 2013, (DGXX+LRA+GPS)
- **ENVISAT (ESA): 800 km, 98.5°** March 2002 → 2013, (D2GM + LRA)  
(Oct 2010: orbit change: altitude reduction -17.4 km)
- **SPOT5 (CNES): 830 km, 98°** May 2002 → 2015 (D2GM only)
- **JASON-1 (CNES/NASA) 1336 km, 66°** Dec 2001 → end 2011 ( D2G+LRA+GPS)
- **SPOT4 (CNES): 830 km, 98°** March 98 → 2012

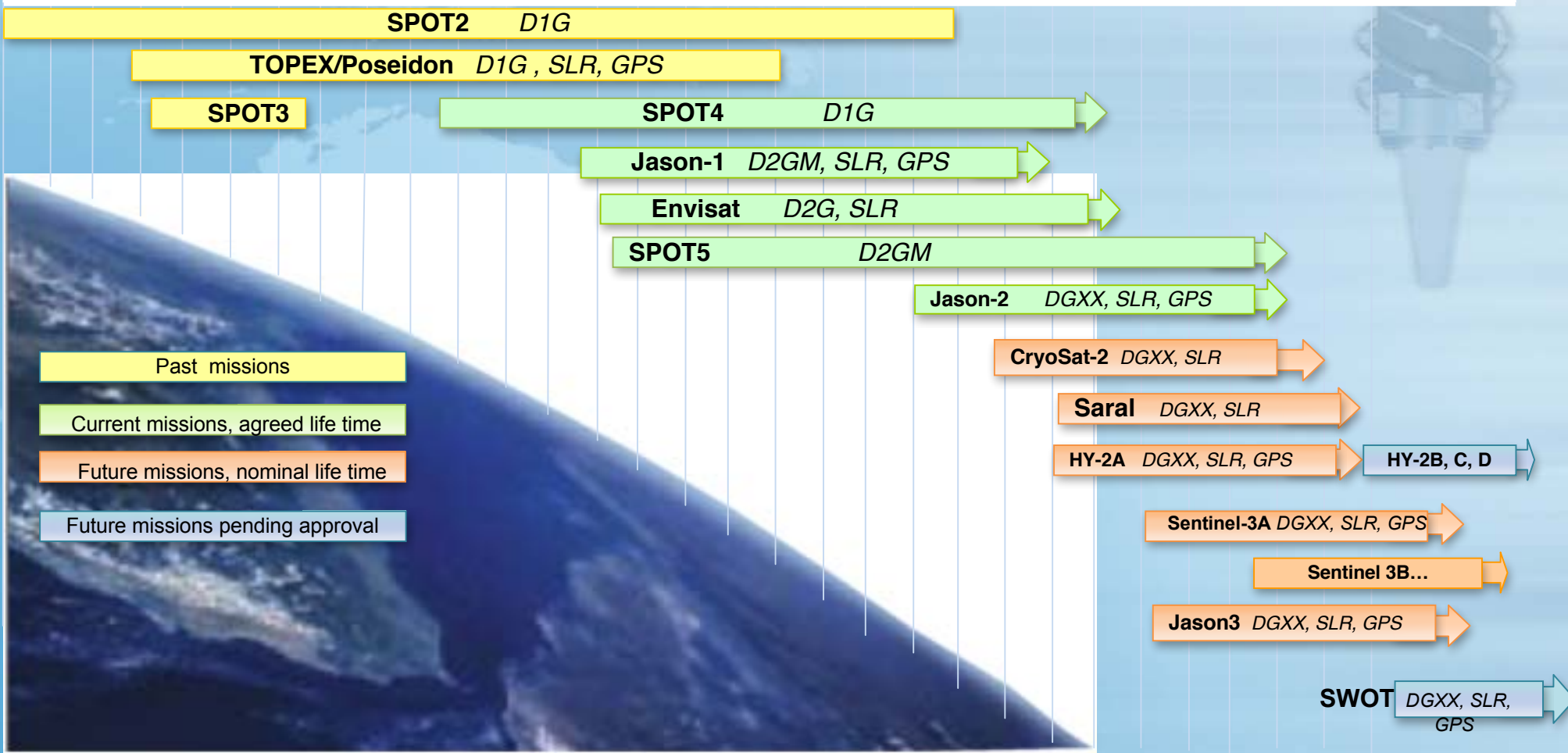
# DORIS Constellation Status - Future Missions

---



- **SARAL/ALTI-KA (ISRO)** : 800km, 98.5°      Mid 2011, ( 5 years), (DGXX + LRA)
- **HY2A (CNSA)** : 963km, 99.3°      June 2011, (3 years), (DGXX+LRA, GPS)  
... then HY2B, 2C, 2D...
- **SENTINEL3A (GMES)** : 814km, 98.6°      April 2013, (7 years), (DGXX+LRA+GPS),  
**Sentinel 3B**: 12 to 30 months later
- **JASON-3 (Eumetsat/NOAA/CNES)** : 1336 km, 66°      Summer 2013 (DGXX+LRA+GPS),
- **SWOT (NASA/CNES)** : 970km, 78°      2020 (DGXX+LRA+GPS),

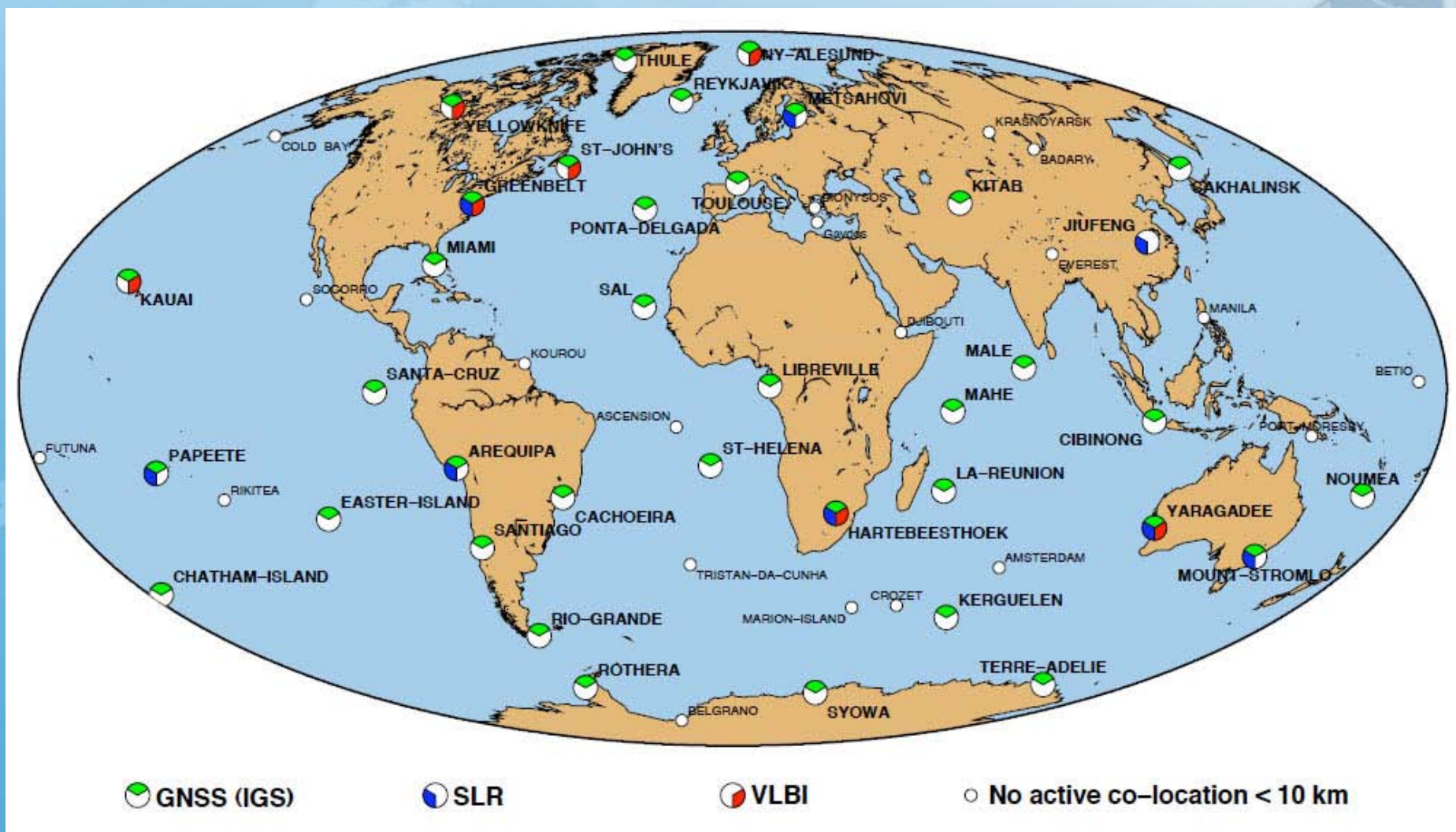
# DORIS CONSTELLATION SUMMARY



- Past missions
- Current missions, agreed life time
- Future missions, nominal life time
- Future missions pending approval



# DORIS Network & Colocations (11/2010)



# Network events, 2010

- **November 2010: New station at Cold Bay (Alaska) operational ...**
- **October 2010: Equipment upgrade at Kourou**
- **October 2010: Fairbanks station decommissioned**
- **September 2010: Beacon replacement at Amsterdam**
- **June 2010: Local tie survey (new GNSS station) at Saint Helena**
- **June 2010: Major renovation at Ascension (antenna move ~40 m; already noticed improvement in DORIS residuals)**
- **June 2010: Beacon out of order at Santa Cruz (remains unsolved)**
- **May 2010: Beacon replacement at Mount Stromlo**
- **May 2010: Local tie survey (new GNSS station) at Libreville**
- **May 2010: Beacon replacement at Cibinong**
- **May 2010: Equipment upgrade at Male**
- **April 2010: Beacon replacement at Marion Island**
- **April 2010: Coordinates update following earthquake at Santiago**
- **April 2010: Beacon replacement at Easter Island**
- **March 2010: Beacon replacement at Chatham Island**
- **February 2010: Equipment upgrade at Hartebeesthoek (HBK)**
- **February 2010: Shutdown at Monument Peak (CA)**

# Cold Bay, Alaska



- On facilities of US Coast Guard.
- Site negotiations facilitated by NOAA (Giovanni Sella).
- NGS/NOAA CORS GPS site.



# Active Network issues

- 1. Goldstone, Replacement for Monument Peak. Open. Need NASA Hq. Re-approvals to return to Goldstone.**
- 2. DORIS-VLBI colocation. How to manage? Plan experiment to determine degree of interference and come up with plan or formula for how DORIS might be “safely” co-located at VLBI locations. (*This is an Action item from both the IDS and IVS Governing Boards*).**
- 3. Riyadh --- New DORIS station, awaiting frequency clearances, hopefully operational in early 2011 (colocation with SLR & GPS).**
- 4. Tamanrasset, Algeria. Project is progressing.**
- 5. New station under consideration for Chichijima, Japan (see next slides).**
- 6. In 2011, renovations planned at Tristan de Cunha, Soccoro, Futuna to improve site and local environment for DORIS operations.**

# DORIs @ Chichijima (1)



# DORIS @Chichijima (2)



## **Chichijima assets:**

- JAXA tracking station.
- VLBI station (GSI 20 m antenna, 7347).
- GNSS/IGS station (CCJ2).
- (old) SLR site occupation (7844).
- Tide gauge. GLOSS station # 103 (data since 1975).

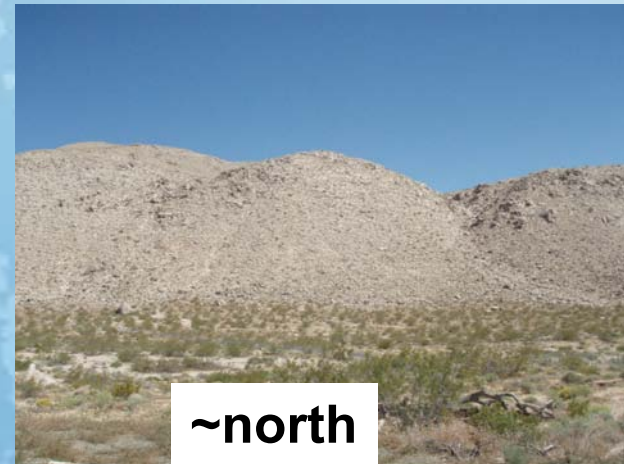
## **Site Advantages:**

- Colocation with other techniques.
- Improvement of network robustness.
- Facilities & staff on site; Fruitful collaboration with local agencies.

# Goldstone site visit (near DSS13)



Concrete pad with old mobile VLBI marker  
(south of old Goldstone DORIS site)



# Network improvement

- ➔ Installation of a remote management system (18 stations)
- ➔ Standardization of the station configuration
- ➔ Respect for system requirements.
- ➔ Beacon model 3.0 deployment almost completed :
  - Futuna : 2.0
  - Socorro : 1.0
- ➔ Maintenance operation on each master beacon every year



# DORIS SPECIAL ISSUE

---

- **Guest Editor:** Pascal Willis.
- **Published in two volumes of Advances in Space Research (Elsevier)**
- **Main scientific themes:** Precise orbit determination, terrestrial reference frame; DORIS technology, troposphere, ionosphere, geophysics and sea level; DORIS data processing and combination.
- **25 submitted articles (April 2009 – November 2009)**
- **Volume 45(12) June 15, 2010: 10 articles; 134 pages.**
- **Volume 46(12) December 15, 2010; 12 articles; 178 page.**
- **First authors (accepted papers only): 20**
  - 11 institutions (first author)
  - 5 countries (first author)

# IDS Citation Update

## New DORIS citation:

P. Willis, H. Fagard, P. Ferrage, F.G. Lemoine,  
C.E. Noll, R. Noomen, M. Otten, J.C. Ries, M. Rothacher,  
L. Soudarin, G. Tavernier, and J.J. Valette,  
**The International DORIS Service (IDS): Toward maturity,**  
*Adv. Space Res.*, 45(12), 1408-1410, doi:10.1016/j.asr.2009.11.018,  
2010.

**All services and users suggested to use this new citation when using IDS data and products.**



<http://ids-doris.org>



Australian Government  
Geoscience Australia

INSTITUTE OF ASTRONOMY  
RUSSIAN ACADEMY OF SCIENCES



Newcastle  
University