

IDS Report

Activities over the past year and expectations over the next two years

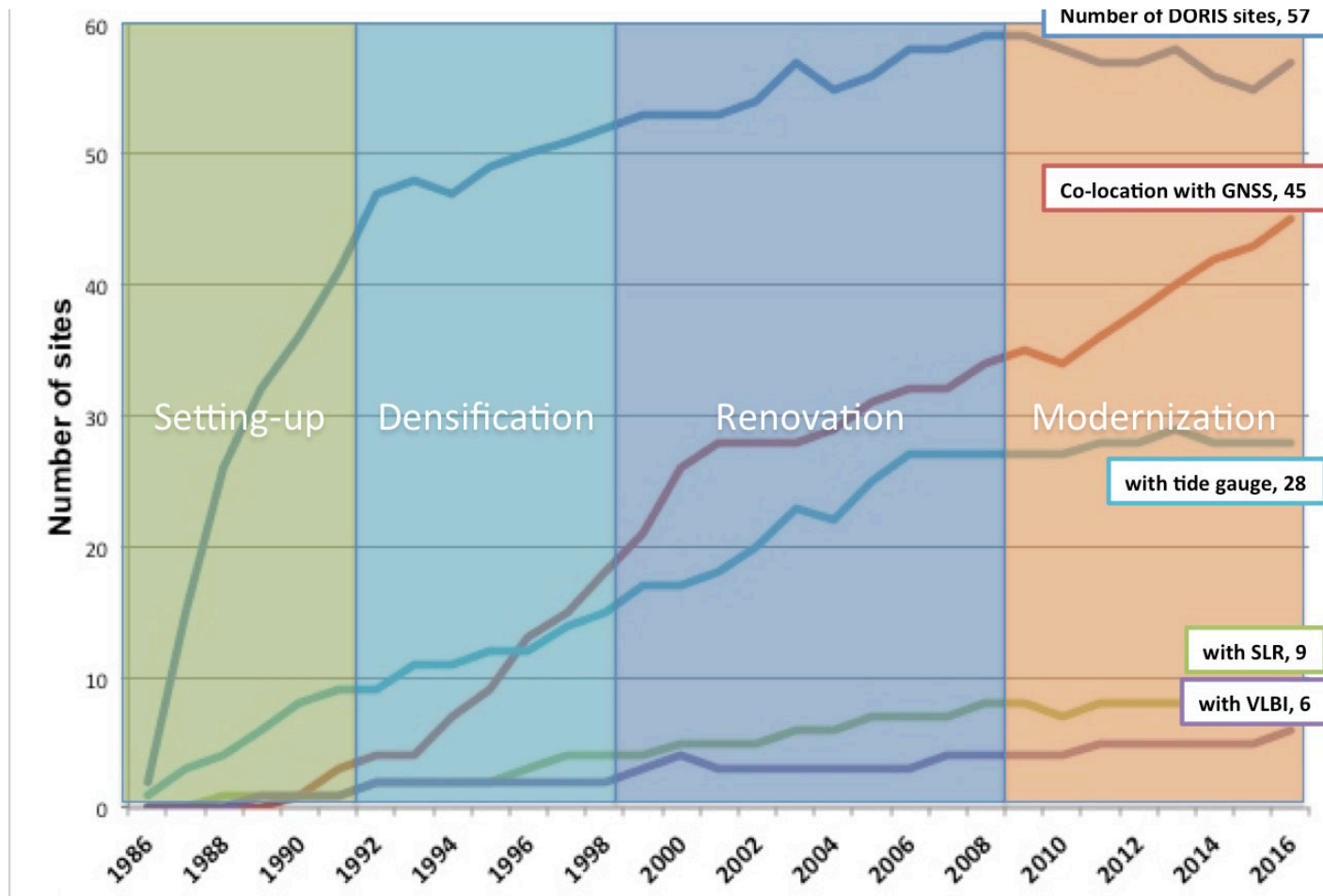
GGOS Bureau for Networks and Observations
San Francisco, 13 December 2016

Doppler
Orbitography
and **R**adiopositioning
Integrated
by **S**atellite

NETWORK BACKGROUND



- CO-LOCATION = PERMANENT OBJECTIVE THROUGHOUT THE NETWORK DEPLOYMENT AND EVOLUTION (30 YEARS)

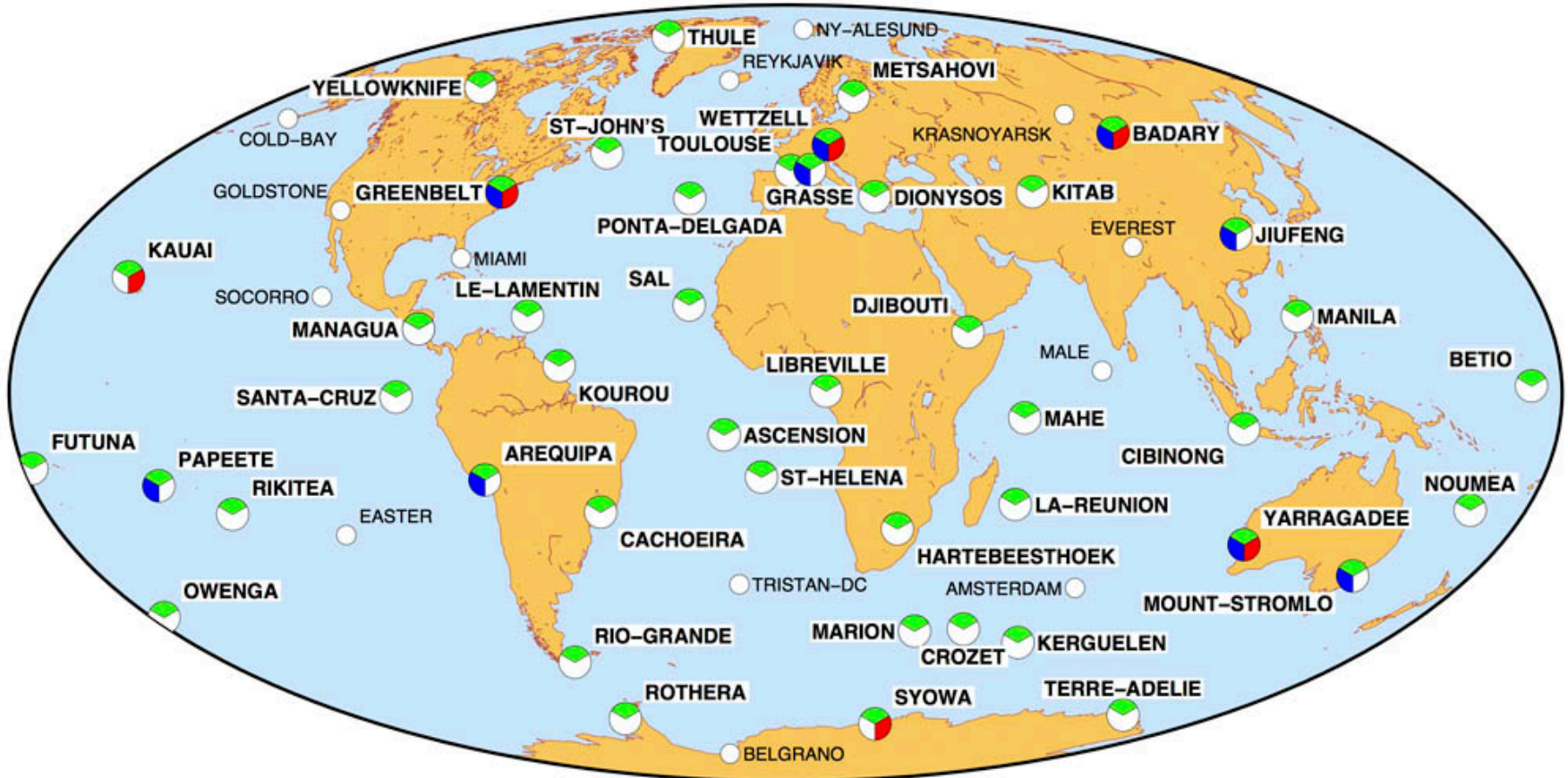


NETWORK STATUS



■ 45 CO-LOCATIONS OUT OF 57 DORIS SITES

🟢 GNSS (IGS) 🟦 SLR 🟡 VLBI ○ No active co-location < 1 km



GM 2016 Nov 10 11:42:03 This map was created by IGN-France

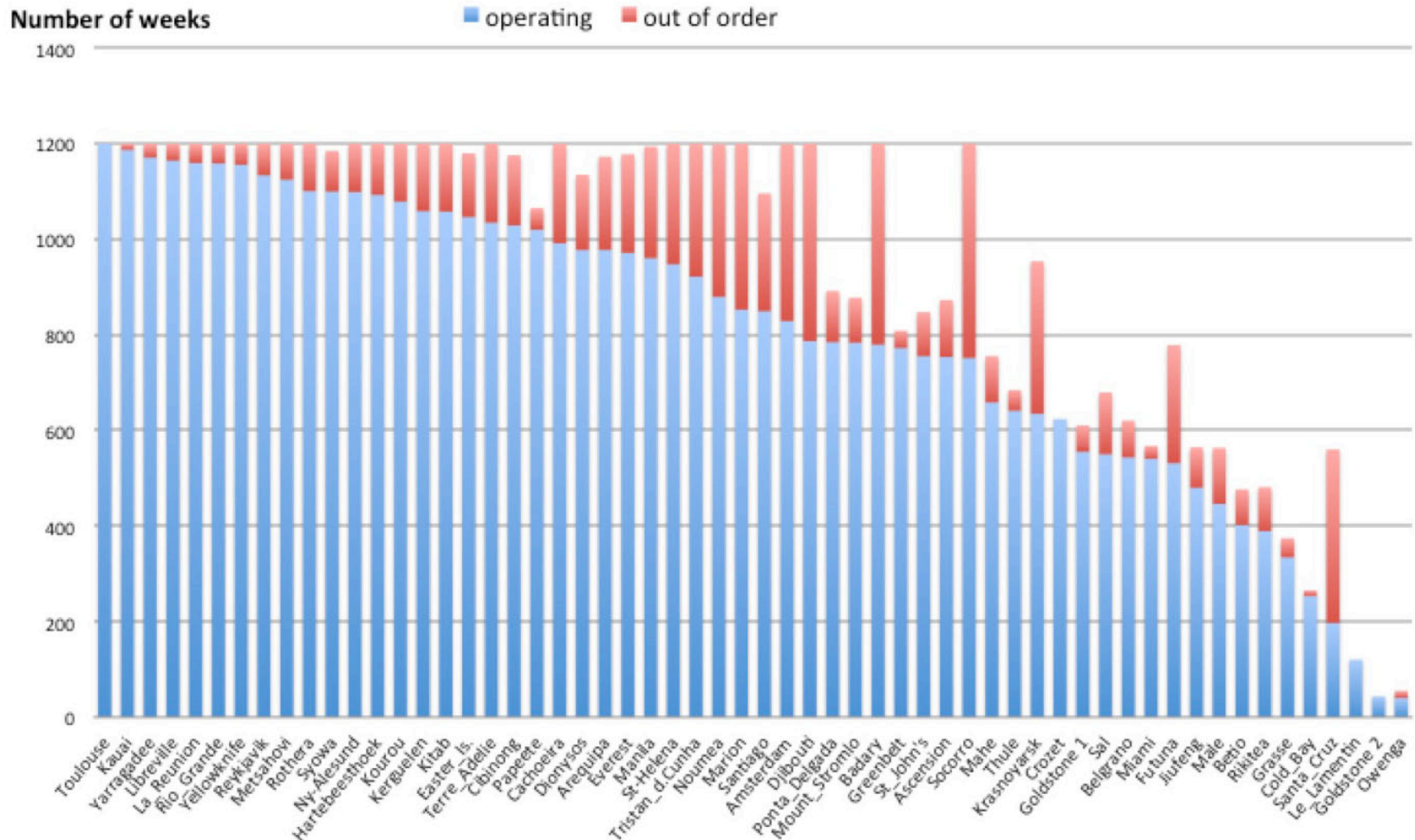


NETWORK STATUS



CONTINUOUS HIGH NETWORK AVAILABILITY (OVER 85% IN 2016)

DORIS network activity from January 1993



■ RECENT NETWORK EVENTS

- Mar. 2016: station re-location at Owenga, Chatham Island, New-Zealand (site refurbishment)
- Apr. 2016: **new station** installing to near IGS « MANA » at **Managua**, Nicaragua
- Jun. 2016: station re-location at Kitab, Uzbekistan (major renovation to get better visibility)
- Sep. 2016: **new station** at **Wetzell**, 4th geodetic site including all four of the techniques

After many **DORIS-VLBI compatibility tests** through varying the distance, the azimuths and elevations of the telescope and placing RF barriers, some basic principles has been established:

- Maximum distance between the two instruments, ideally 300-400m
- At shorter distance, no direct visibility using local topography or RF blocking structures (the maximum gain lobe of the VLBI antenna must never point towards the DORIS antenna)
- The received power has its maximum in the direction of the DORIS antenna at low elevations ($< 20^\circ$)
- Obstacles between the antennas (hills, buildings, RF blocker) attenuate the signal up to ~ 20 dB
- Reflections at objects (trees, buildings) strongly contribute to the total received power (RHCP \sim LHCP)

*For further information, see Thomas Klügel presentation:
ids-doris.org/meetings/ids-meeting.html > 2016 > IDS Workshop*

■ SHORT TERM (NEXT 6 MONTHS):

- San Juan, AR: new station installing in place of Santiago (**3 techniques site**)
- Easter Island, Chile: relocating (hosting migration)
- Guam, US: new station to near IGS station, GUUG

■ LONGER TERM (2017-2018):

- Katherine, AS: new station installing in place of Port-Moresby (**3 techniques site**)
- Ny-Ålesund, Spitzberg, Norway: relocating (new **4 techniques site**)
- Changchun, CN: new station installing in place of Sakhalinsk (**3 techniques site**)
- Reykjavik, IS: station relocating (site closure)
- Papenoo, Tahiti, FR: new **4 techniques site** under construction

FUTURE DEVELOPMENTS

■ 4TH GENERATION DORIS GROUND BEACON

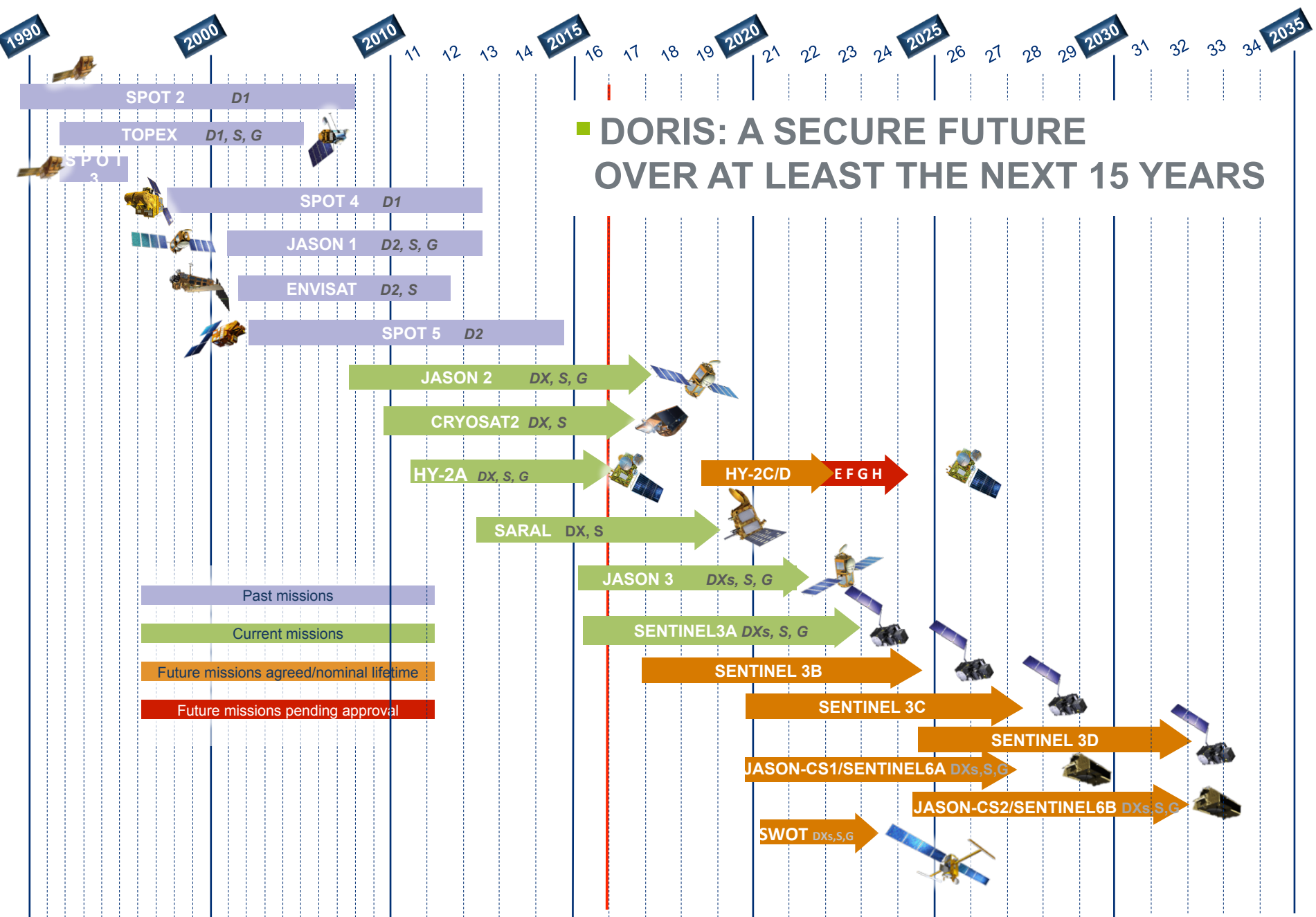
- New electronic components; new architecture
- Antenna cables allowing to install it up to 50m from the beacon
- Initial deployment could start mid 2019

■ MONUMENT STABILITY MONITORING

- “Assessment of the DORIS network monumentation” (10.1016/j.asr.2016.02.026)
- Equipping sites with control points and targets to carry out stability monitoring surveys

■ DORIS / VLBI RF COMPATIBILITY

- Investigation for RF blockers or absorbers



On board instruments:

D1, D2, DX, DXs: DORIS/versions, S:SLR, G:GNSS

■ IDS ELECTIONS

- Frank Lemoine, new Analysis Center representative has been designated as the Chair of the IDS GB for 2017-2020

■ PUBLICATION OF SPECIAL ISSUE ON DORIS, ADV. SPACE RESEARCH

- Scientific Applications of DORIS in Space Geodesy
- Vol 58, Number 12, Dec 15, 2016
- Edited by Frank G. Lemoine, Ernst J.O. Schrama

■ IDS NEWSLETTER

- Launch in Apr. 2016
- 2 newsletters already on-line at ids-doris.org/report/newsletter.html
- Newsletter#3 (in preparation) will focus on the IDS Workshop (La Rochelle, Nov. 2016)

■ NEXT IDS MEETINGS

- IDS AWG, in London (UCL), May 2017
- IDS Retreat under preparation