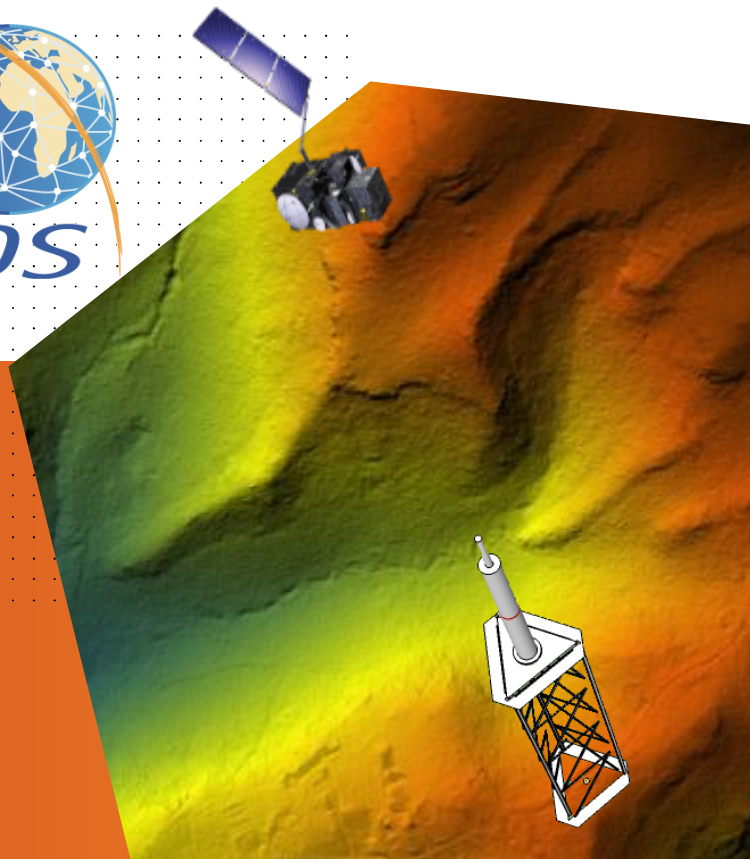


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DORIS NETWORK STATUS REPORT

IDS Analysis Working Group Virtual Meeting
14 June 2022

Jérôme Saunier, IGN - France

A PARTICULARLY CHALLENGING SITUATION



COVID-19 Sanitary Crisis:

Impossible access to the sites in the last two years

Shipment, customs clearance, administrative procedures were complicated

All projects been frozen

Difficult geopolitical and security situation in some countries:

Russia: Krasnoyarsk definitively removed; Badary stopped until further notice from the Russian Government

A number of risk areas: North Africa, Middle East, Central America

=> Consequences:

Numerous stations requiring on-site maintenance operations

Gaps in coverage over North Asia and Pacific Ocean

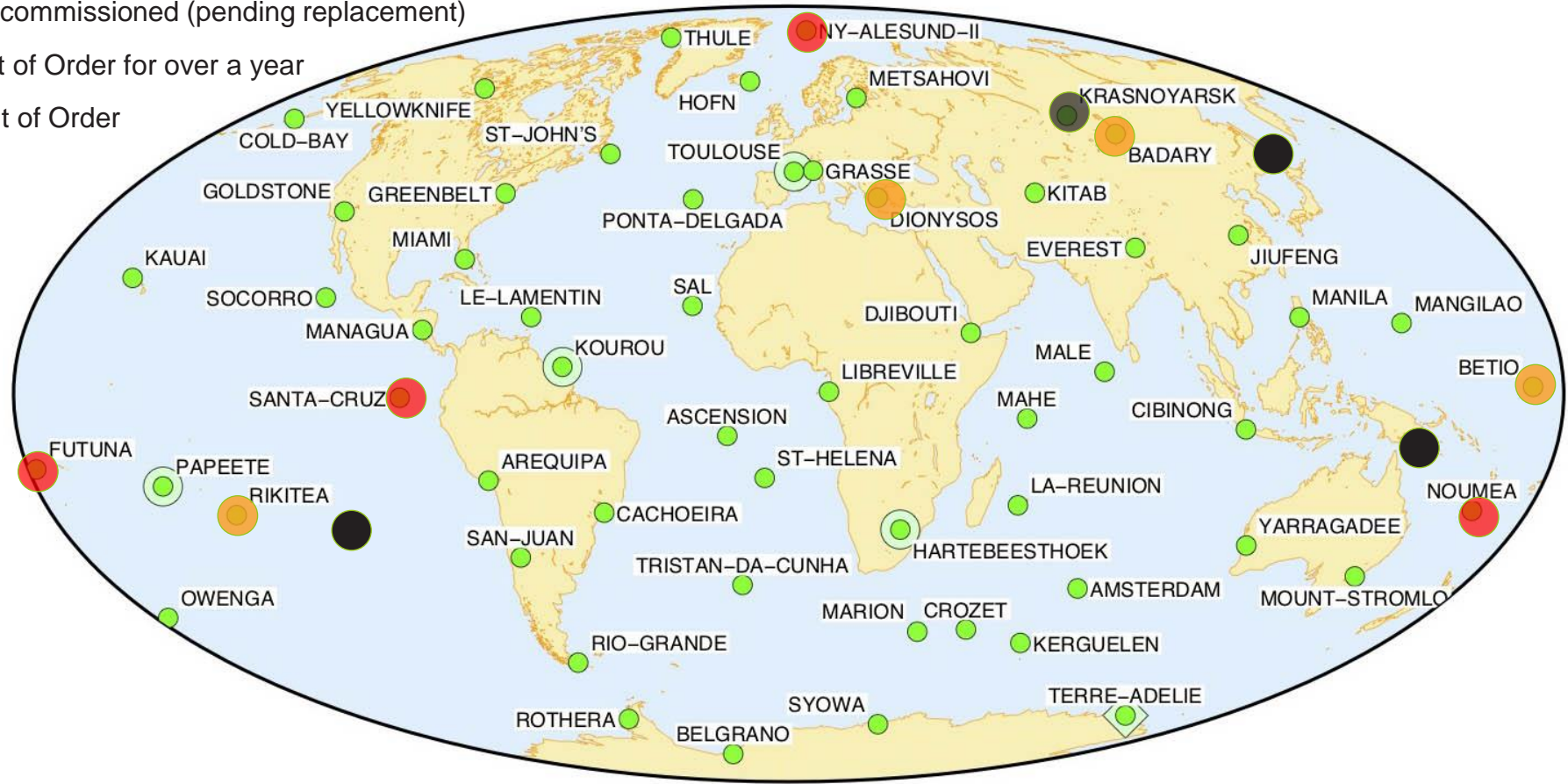
But thanks to remote maintenance with the help of local host agencies and some on-site operations when and where feasible (French territories and Europe), we maintained a sufficient number of operating stations for the system needs.

PERMANENT NETWORK OPERATIONAL STATUS



⊙ master beacon ⬠ time beacon

- Decommissioned (pending replacement)
- Out of Order for over a year
- Out of Order



GM 2021 Mar 31 09:29:32 This map was created by IGN-France

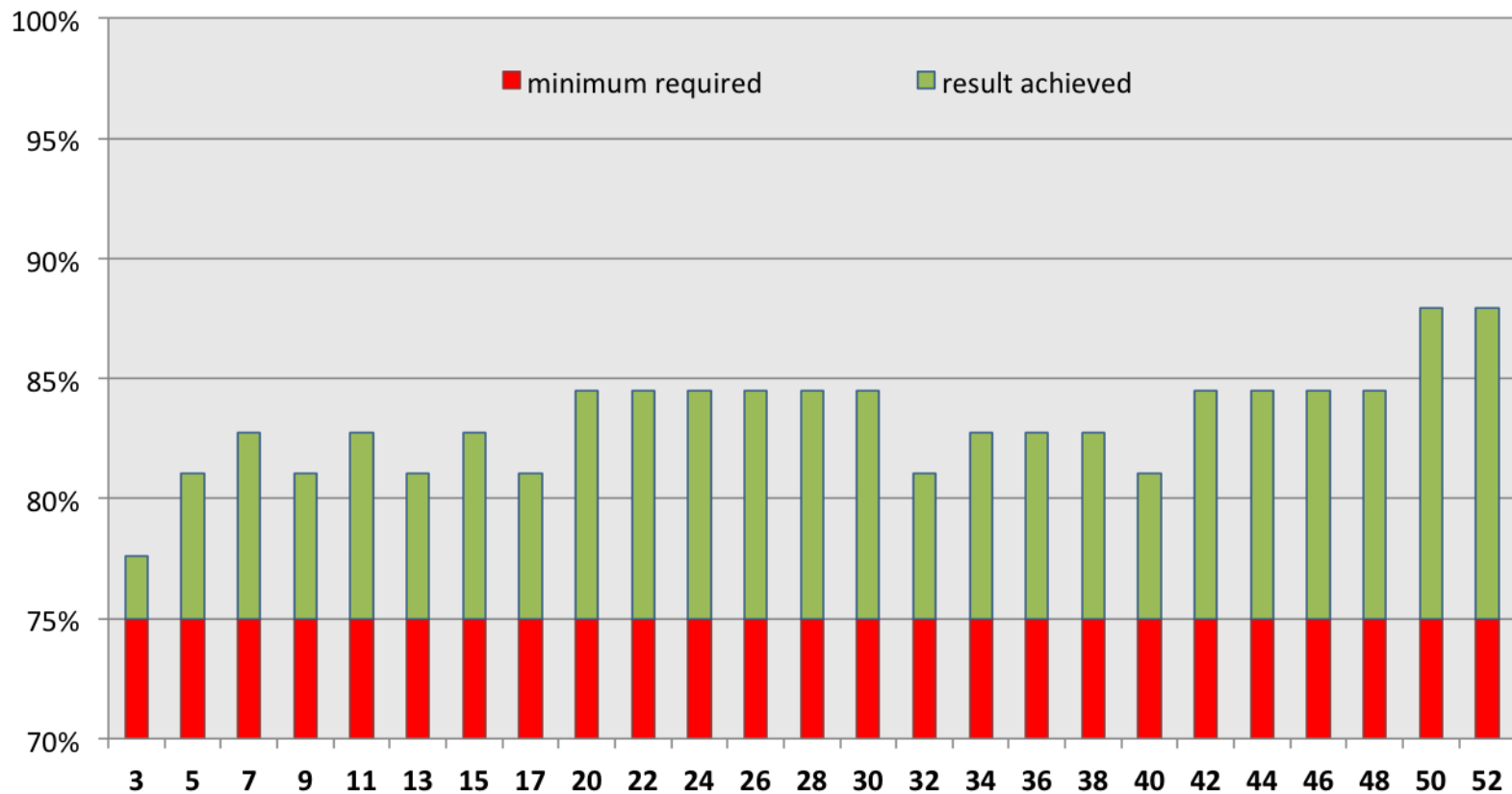
📍 8 beacons are out of order and 4 decommissioned

NETWORK AVAILABILITY




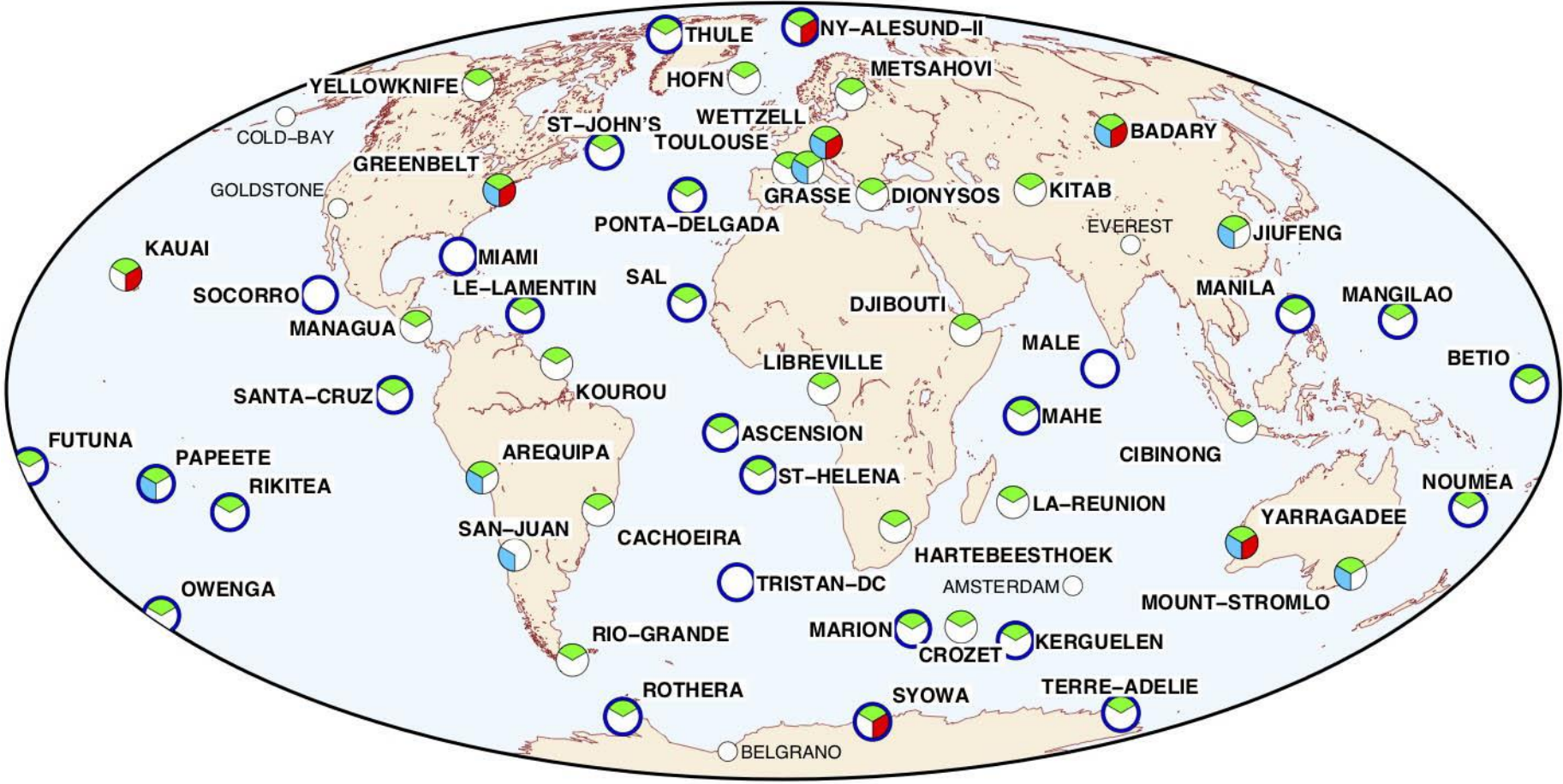
📍 Good network availability thanks to the joint effort of CNES, IGN and Host Agencies teams

Network availability 2021: Rate of stations in operation (fortnightly statement)



DORIS stations co-located with other IERS techniques and tide gauges

-  GNSS (IGS)
-  SLR
-  VLBI
-  Tide gauge
-  No active co-location



GM 2022 Jun 13 09:42:41 This map was created by IGN-France

 Today: 49 stations out of 58 co-located with at least one other IERS technique / 27 with tide gauges

NETWORK EVENTS 2021



 Continuation of of the 4th generation beacon deployment with priority to broken-down stations

2021	Station		Event
March	KEXC	<i>Kerguelen</i>	<i>Antenna replacement</i>
April	ROZC	<i>Rothera</i>	<i>Beacon replacement: 3G > 4G + Antenna replacement</i>
	KIVC	<i>Kitab</i>	<i>Beacon replacement (3G)</i>
May	KEYC	<i>Kerguelen</i>	<i>Antenna support modification</i>
July	REVC	La Réunion	Beacon + Antenna replacement
August	MEUB	<i>Metsahovi</i>	<i>Beacon replacement: 3G > 4G</i>
September	MALC	Malé	Major renovation (antenna move + equipment upgrade)
October	TRJB	Tristan da C.	<i>Beacon replacement: 3G > 4G</i>
November	MAIB	Mahé	<i>Beacon replacement: 3G > 4G</i>

In normal font: on-site operations carried out by IGN

In italics: operational maintenance (equipment replacement) managed by CNES with the participation of Host Agencies

NETWORK EVENTS 2022



Gradual recovery of on-site operations in 2022

2022	Station		Event
Jan.	CIDB	<i>Cibinong</i>	<i>Beacon replacement: 3G > 4G</i>
	KRWB	<i>Kourou</i>	<i>Beacon replacement: 3G > 4G</i>
April	KRBB	Krasnoyarsk	Definitive decommissioning
	BADB	<i>Badary</i>	<i>Switch-off until (at least) end of 2022</i>
	HBMB	<i>Hartebeethoek</i>	<i>Beacon replacement: 3G > 4G</i>
June	CADB	Cachoeira	Reconnaissance with a view to relocate the antenna
	SJVC	San Juan	Beacon replacement: 3G > 4G + Antenna replacement

In normal font: on-site operations carried out by IGN

In italics: operational maintenance (equipment replacement) managed by CNES with the participation of Host Agencies

STATIONS DEDICATED TO IDS

Wetzell:

Into operation since September 2016

- 📍 **Shifted frequency (k=18) to avoid Doppler collisions**
- 📍 **Automatic stand-by when no DORIS satellite overhead**
- 📍 **Very few low elevation observations (<10°)**

Main interest: 4 techniques site

Good performance results

Second IDS dedicated station:

Call for proposals: Hosting a DORIS station disseminated on April 27th, 2022 through IAG Services Mailing Lists and web: <https://ids-doris.org/2022-call-for-interest.html>

- 📍 **Expectations in terms of scientific outcomes**
- 📍 **Benefits to the DORIS system and to the IDS.**
- 📍 **Site complying to DORIS installation requirements**

Deadline: June 15th, 2022

- 📍 **Proposals received: Kanpur (India), Zhuhai (China), Herstmonceux (UK), Ondřejov (Czech Rep.)**



NETWORK EQUIPMENT UPGRADING

4th generation beacon deployment

Slowed down by Covid-19

23 stations now equipped: 40% of the network

Next on the list: Ny-Alesund II, Santa-Cruz, Djibouti, Futuna...

Gradual replacement of Starec antennae B type with C

Reminder: the uncertainty of the vertical location of the 2GHz phase center is reduced from 5 to 2 mm

22 stations equipped with Starec C: 38% of the network

Last station equipped with Starec C: Malé (MALC)

Back to the manufacturer of all antennas in stock: manufacturing defect causing corrosion and breakdown on various sites

=> on-site operations requiring antenna replacement are postponed till July 2022



NETWORK EVOLUTION



Scheduled in 2022:

Jul.: **Ny-Alesund II**, Svalbard, Norway: 4th generation beacon installation

Aug.: **Santa-Cruz**, Galapagos, Ecuador: 4th generation beacon installation and site survey

Sept.: **Futuna**, Pacific Ocean: 4th generation beacon installation

Sep.: **Gavdos**, Crete, Greece: station installation and site survey

Oct.: **Hanga Roa**, Easter Island, Chile: station installation and commissioning

Nov.: **Everest**: antenna relocation and equipment upgrading

Nov.: **Katherine**, Australia (co-location GNSS + VLBI): station installation and commissioning

Dec.: **Rikitea**, French Polynesia: major renovation (antenna move + equipment upgrading)

Short term (2023):

Syowa, Antarctic: renovation and equipment upgrading

Sal, Cape Verde: antenna relocation and equipment upgrading

Cachoeira Paulista, Brazil: antenna relocation and equipment upgrading

Changchun, China (co-location GNSS + SLR): station installation and commissioning

Longer term:

Krasnoyarsk: decommissioning and search for a new site

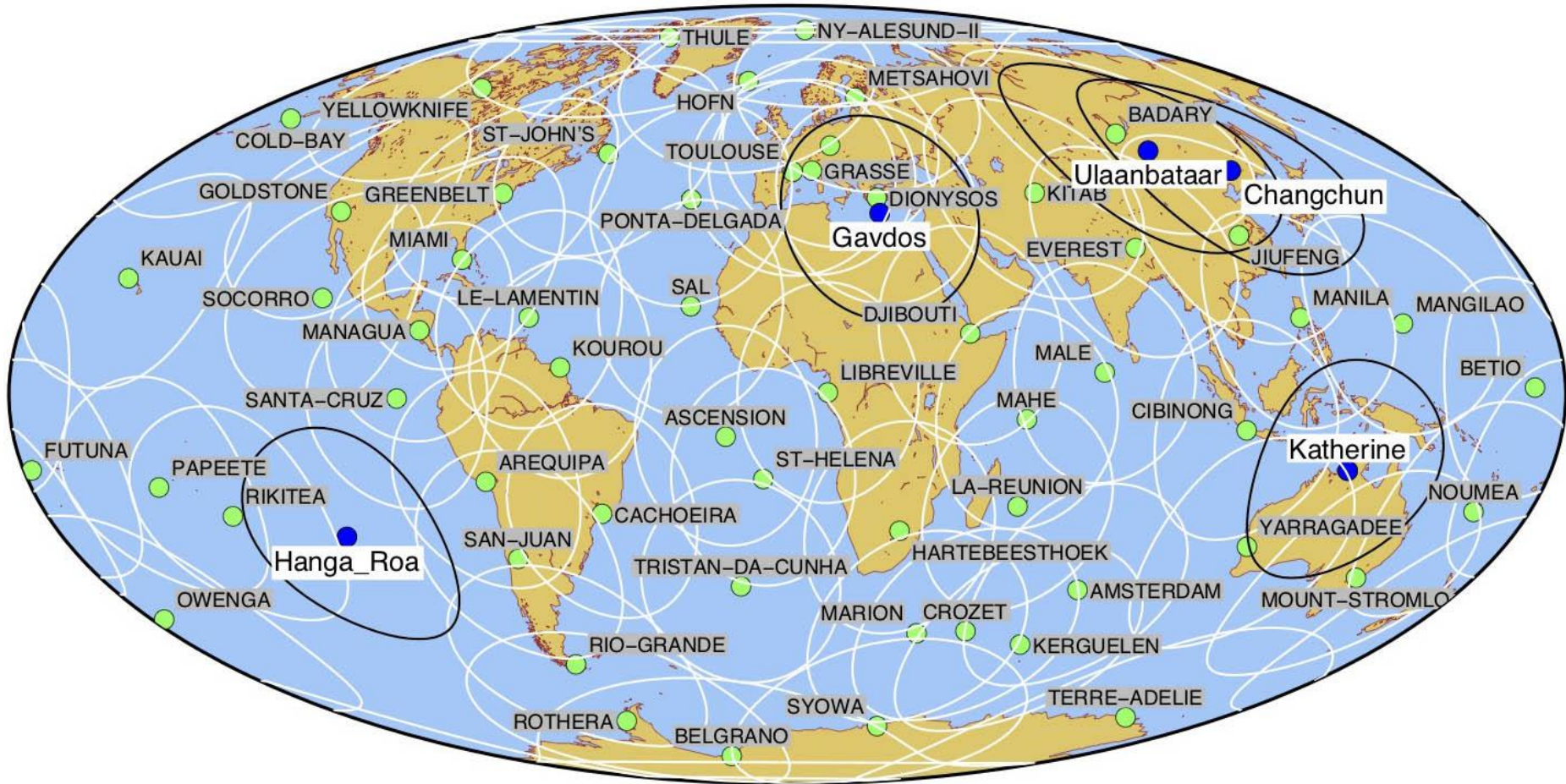
Le Lamentin, French Indies: antenna relocation and equipment upgrading

Papenoo, French Polynesia (co-location GNSS + SLR + VLBI): station installation

NEW SITES IN THE COMING MONTHS



Significant improvement of the network coverage and robustness



GM 2022 Jun 13 18:52:55 This map was created by IGN-France



DORIS Network

IDS AWG Virtual Meeting, June 14th, 2022



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