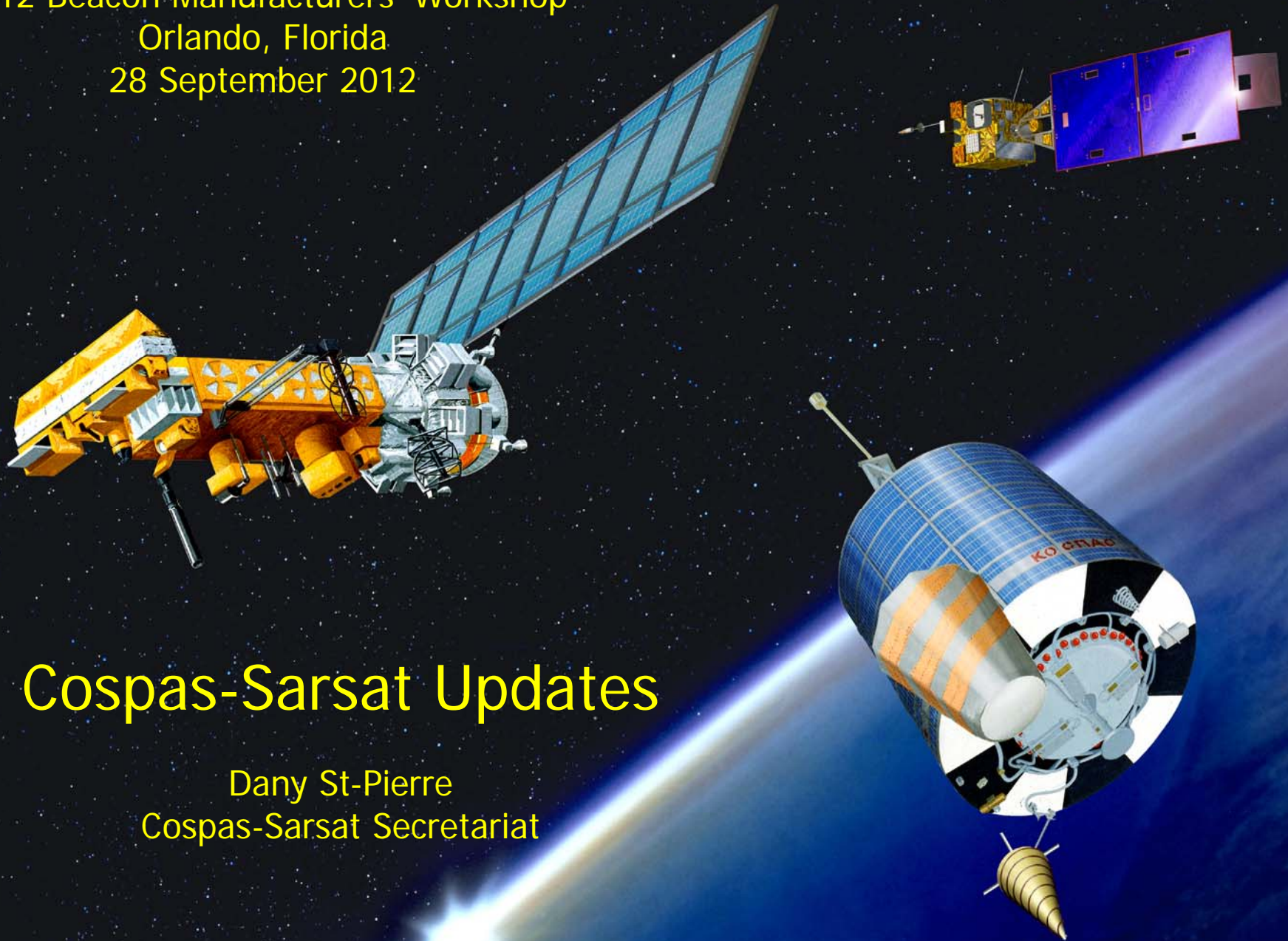


2012 Beacon Manufacturers' Workshop
Orlando, Florida
28 September 2012

Cospas-Sarsat Updates

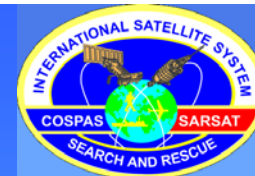
Dany St-Pierre
Cospas-Sarsat Secretariat



Cospas-Sarsat Updates



- **International Cospas-Sarsat Programme**
- **Space Segment and LUTs status**
- **Saves and Events**
- **MEOSAR System and status**
- **IBRD and Website Updates**
- **Upcoming Events and Activities**



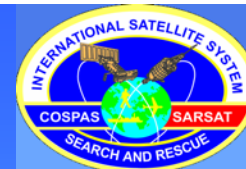
Cospas-Sarsat

Mission and Objective

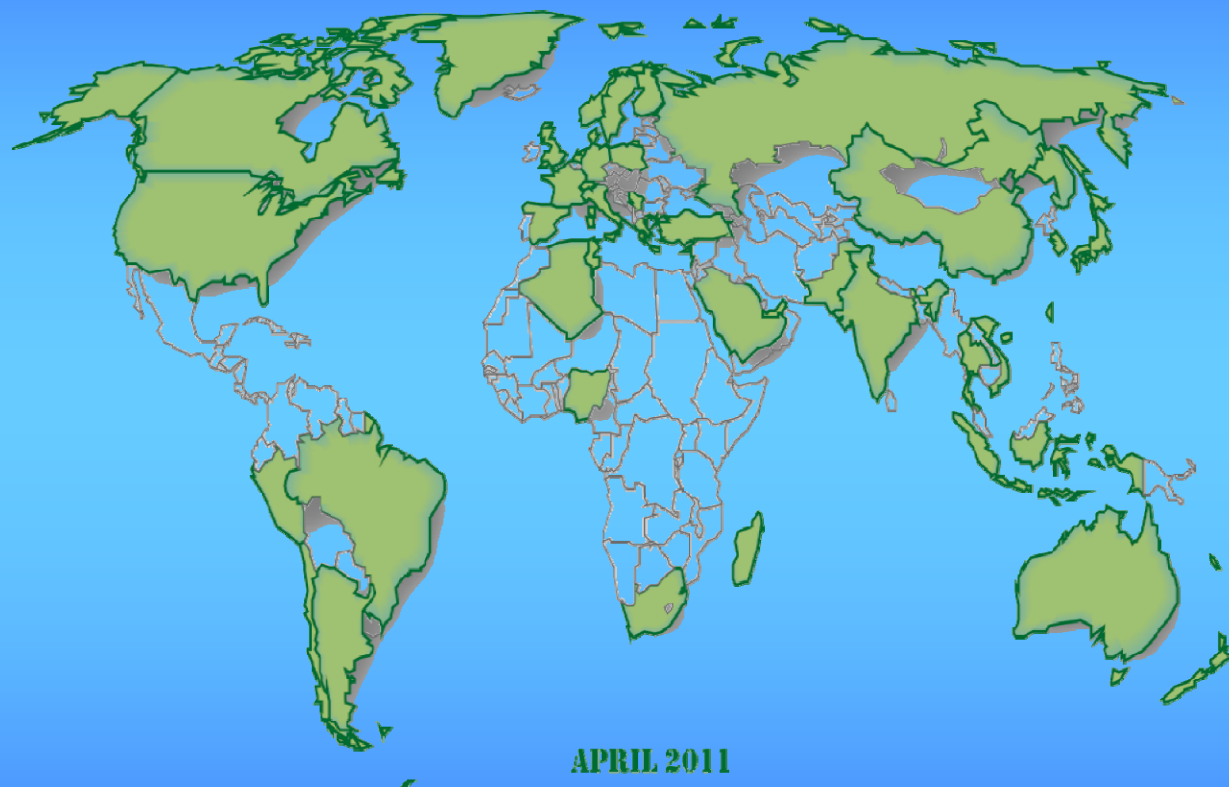
Mission: To provide accurate, timely and reliable distress alert and location data to help SAR authorities assist persons in distress.

Objective: To reduce, as far as possible, delays in the provision of distress alerts to SAR and the time to locate a distress and provide assistance.

Strategy: To implement, maintain, co-ordinate and operate a satellite system capable of detecting transmissions from radio-beacons that comply with C/S specifications.



Cospas-Sarsat Participants



- | | |
|---------------|--------------|
| Algeria | Netherlands |
| Argentina | New Zealand |
| Australia | Nigeria |
| Brazil | Norway |
| Canada | Pakistan |
| Chile | Peru |
| China (P.R.) | Poland |
| Cyprus | Russia |
| Denmark | Saudi Arabia |
| Finland | Serbia |
| France | Singapore |
| Germany | South Africa |
| Greece | Spain |
| Hong Kong | Sweden |
| India | Switzerland |
| Indonesia | Thailand |
| Italy | Tunisia |
| ITDC | Turkey |
| Japan | UAE |
| Korea (R. of) | UK |
| Madagascar | USA |
| | Vietnam |

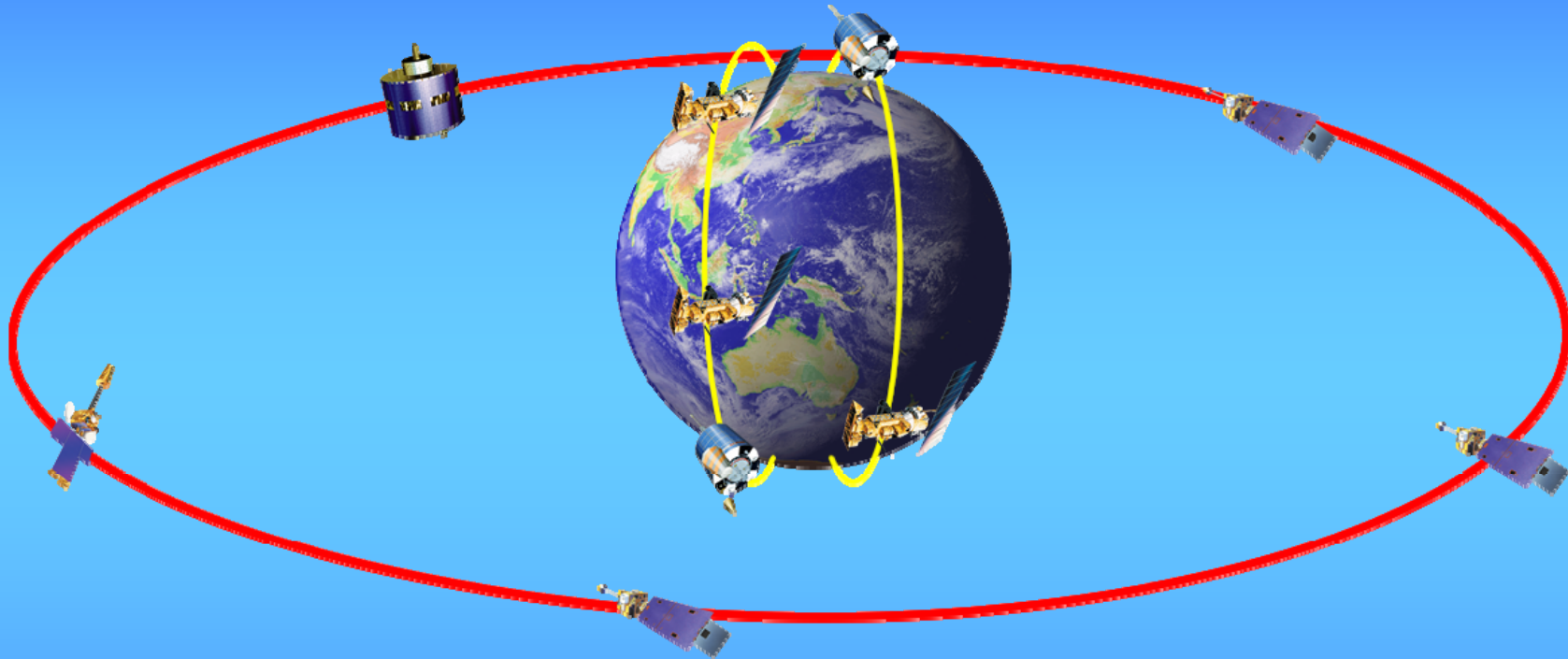
- 4** Founders: Canada, France, Russia and the USA
- 26** Ground Segment Providers
- 11** User States
- 2** Organisations

- 60 % of world land area
- 72 % of world population
- 84 % of estimated world wealth



Cospas-Sarsat System

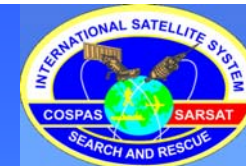
Combined LEO / GEO Operations



- **LEOSAR:** Sarsat (NOAA, MetOp) and Cospas
- **GEOSAR:** GOES (USA), INSAT (India), MSG (EUMETSAT), Electro-L and Louch (Russia)

Cospas-Sarsat

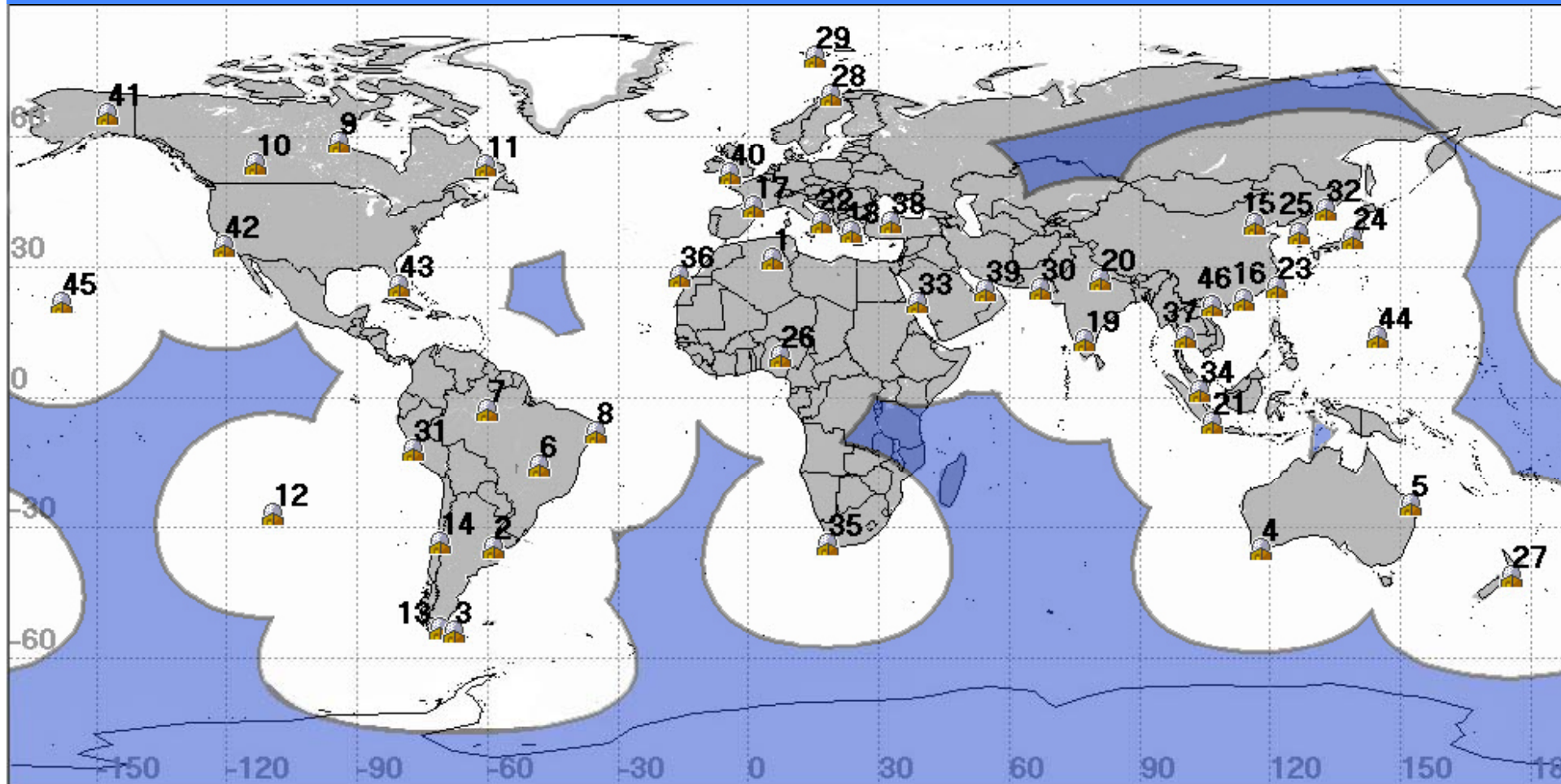
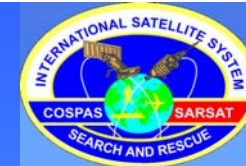
LEOSAR Space Segment Status

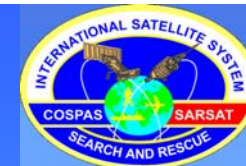


Cospas-Sarsat Payload	Spacecraft	Launch Date	Status
Sarsat-7	NOAA-15	May 1998	O
Sarsat-8	NOAA-16	September 2000	O
Sarsat-9	NOAA-17	June 2002	O
Sarsat-10	NOAA-18	May 2005	O
Sarsat-11	METOP-A	October 2006	O
Sarsat-12	NOAA-19	February 2009	O
Sarsat-13	METOP-B	September 2012	UT
Sarsat-14	Free Flyer	Projected 2016	-
Cospas-13	METEOR	Projected 2014	-
Cospas-14	METEOR	Projected 2015	-

6 LEO in operation, 1 LEO under test, 3 still planned to be deployed

Cospas-Sarsat 57 LEOLUTs





Satellite Gap Time for the current satellite configuration vs various beacon locations

Satellite Configuration	Low Latitude 0-30 degrees		Mid- Latitude 30-60 degrees		High Latitude 60-90 degrees	
	Median Satellite Gaps (Hrs)	95% Satellite Gaps (Hrs)	Median Satellite Gaps (Hrs)	95% Satellite Gaps (Hrs)	Median Satellite Gaps (Hrs)	95% Satellite Gaps (Hrs)
6 satellites in 3 planes (Current)	< 0.75	< 3.3	< 0.7	< 3.3	< 0.25	< 1.7

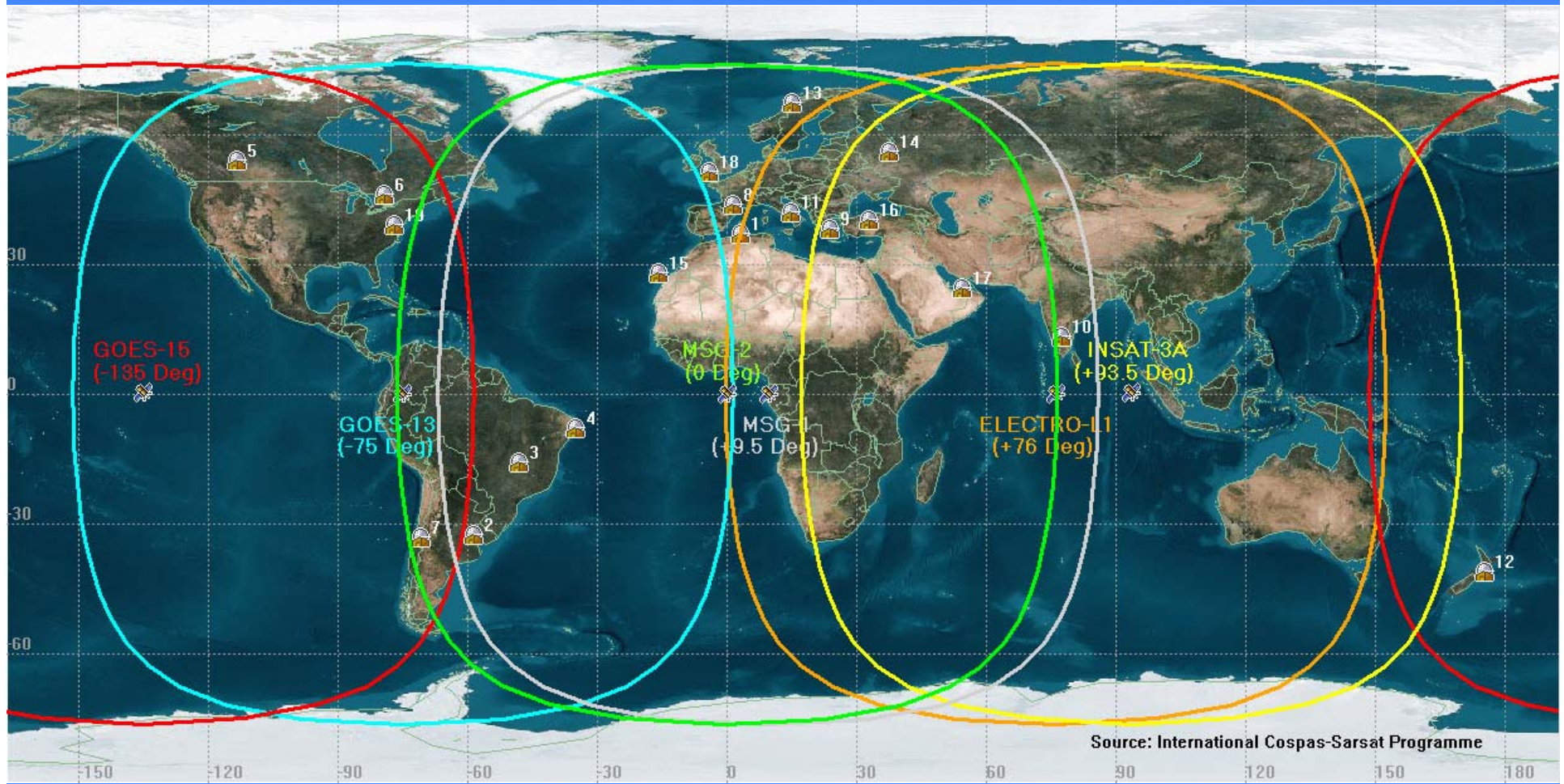
Cospas-Sarsat GEOSAR Space Segment Status



Spacecraft	Launch Date	Position	Status
GOES-12	July 2001	60° W	In-orbit spare
GOES-13 (East)	May 2006	75° W	In operation
GOES-14	June 2009	105° W	In-orbit spare
GOES-15 (West)	March 2010	135° W	In operation
GOES-16	Projected 2016	TBD	Projected
GOES-17	Projected 2017	TBD	Projected
INSAT-3A	April 2003	93.5° E	In operation
INSAT-3D	Projected 2012 / 2013	83.5° E	Projected
MSG-1	August 2002	9.5° E	In operation
MSG-2	December 2005	0° (9.5° E)	In operation
MSG-3	August 2012	3.4° E (0°)	Under Test
MSG-4	Projected 2015	TBD	Projected
Elektro-L No.1	January 2011	76° E	In Operation
Louch-5A	December 2011	95° E (167 ° E)	Under test
Elektro-L No.2	Projected 2012	16° W	Projected

6 GEO in operation, 2 in testing (1 in new position), many more to come

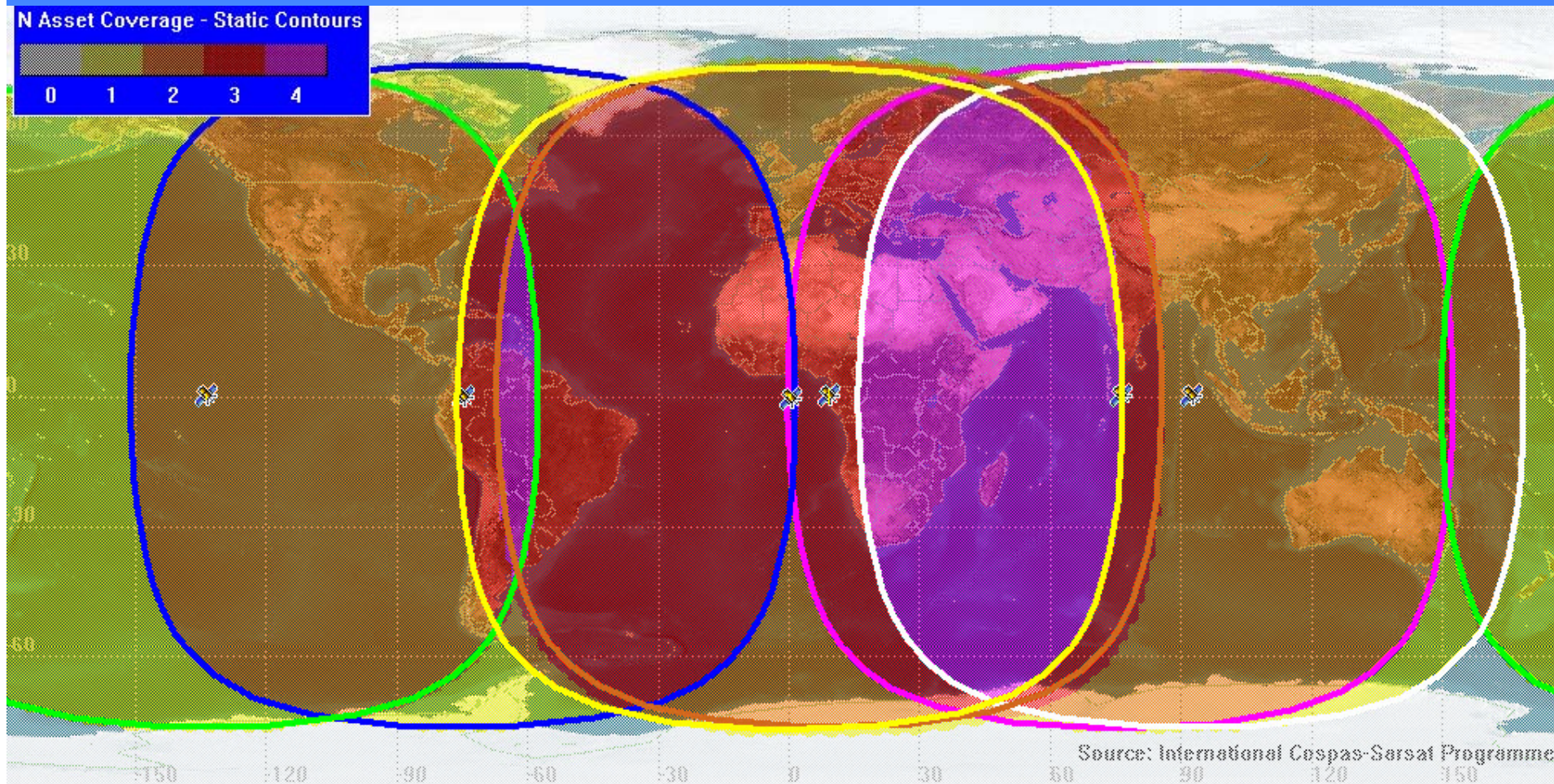
Cospas-Sarsat 22 GEOLUTs





GEOSAR Visibility (Sept. 2012)

N Asset Coverage - Static Contours

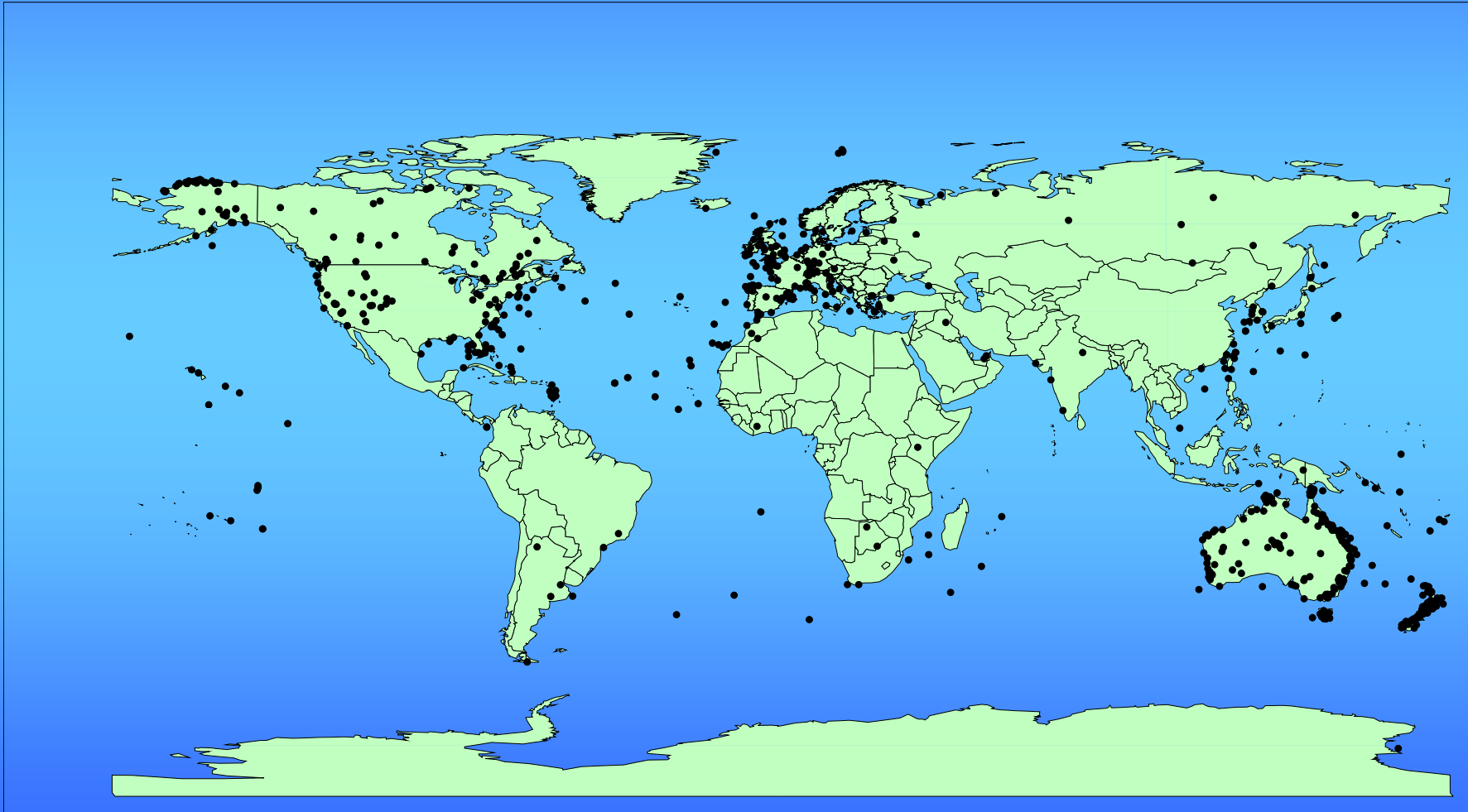


Source: International Cospas-Sarsat Programme

1 satellite visibility 96.1%
3 satellites visibility 38.5%

2 satellites visibility 80.9%
4 satellites visibility 15.3%

Cospas-Sarsat 2011 – Alert Locations





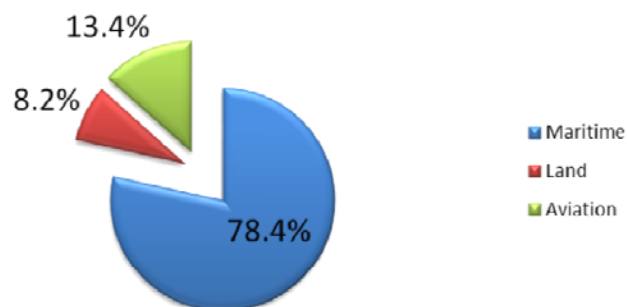
Cospas-Sarsat Rescue Operations Statistics

2011

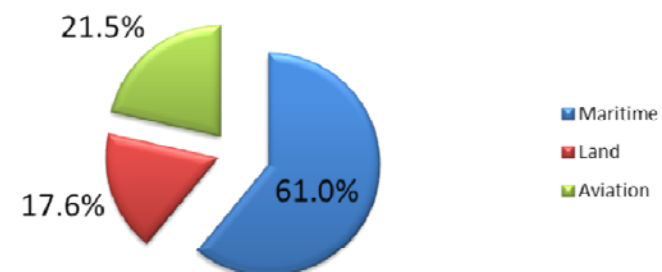
SAR Events: 637 (641 in 2010)
P. Rescued: 2208 (2338 in 2010)

SAR Events (1982 / 2011) : > **9,024**
P. Rescued (1982 / 2011) : > **32,921**

Persons 1982-2011

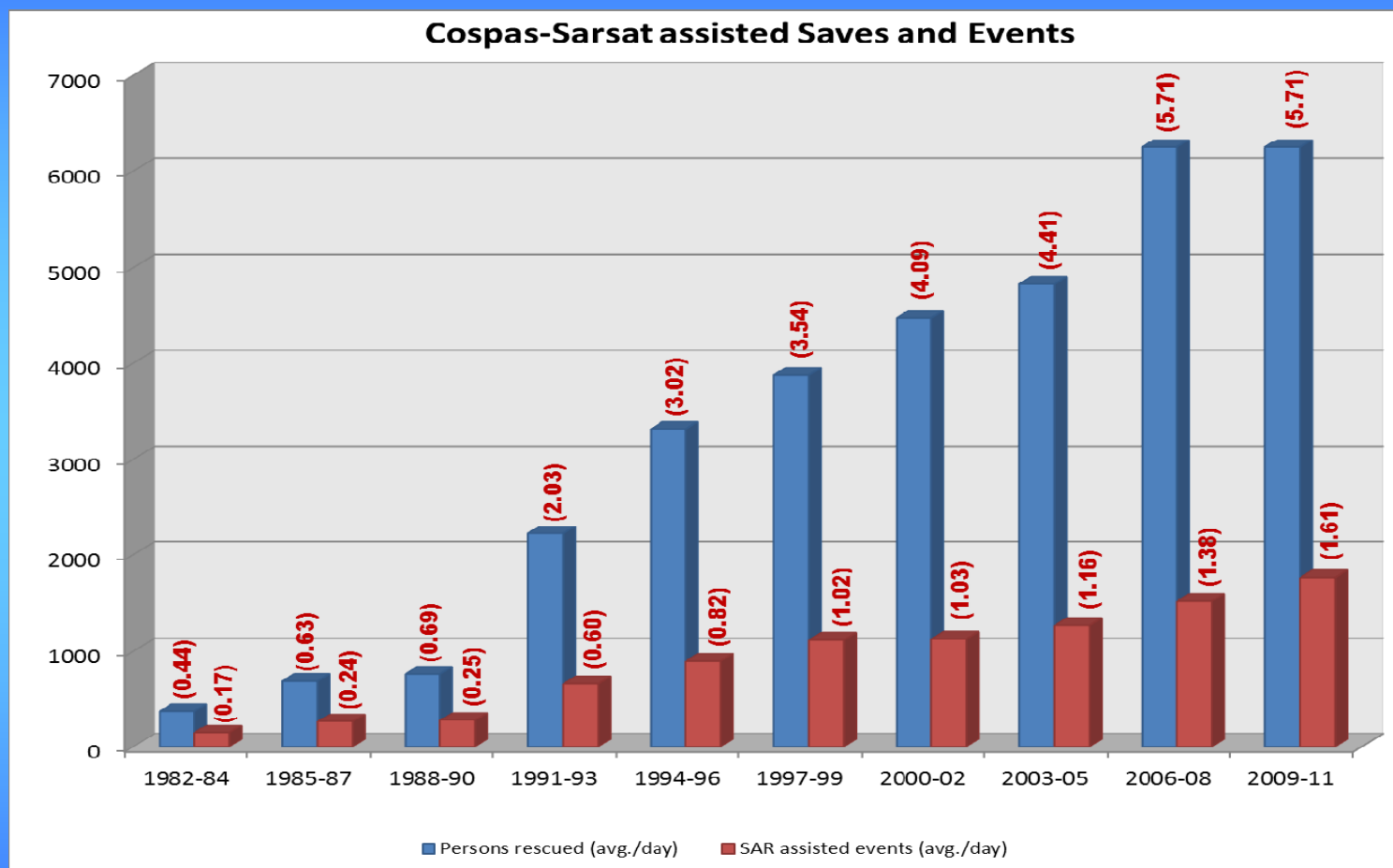


Events 1982-2011





Cospas-Sarsat Assisted Rescues Evolution



ON AVERAGE 5.71 ASSISTED RESCUES PER DAY IN THE LAST 6 YEARS



Cospas-Sarsat

Operational MEOSAR System

USA (GPS), Russia (GLONASS), and ESA/EC (Galileo) plan to include 406 MHz repeaters on future medium-altitude Earth orbiting (MEO) satellite constellations

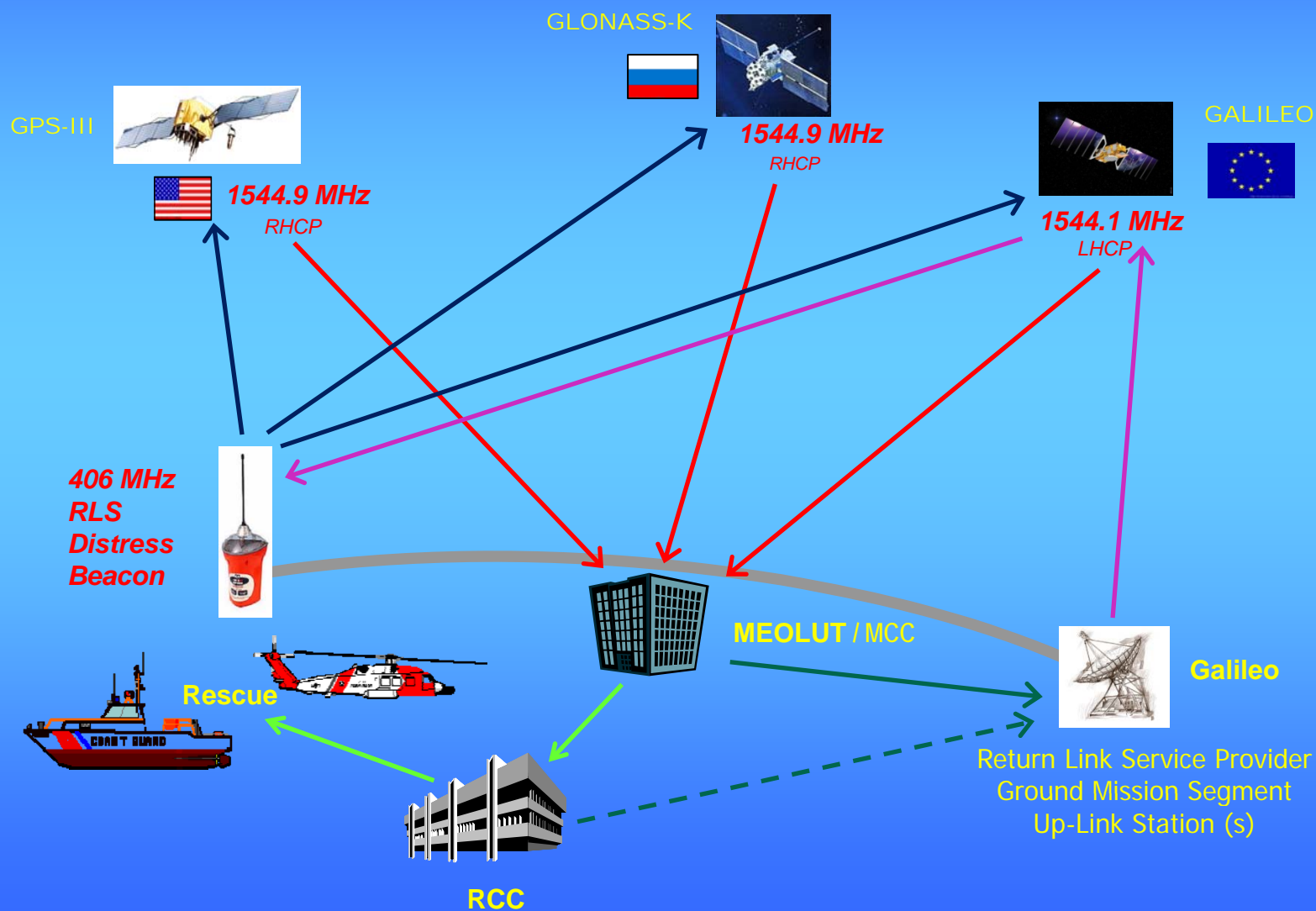


- Backward compatible with C/S T.001 406MHz Beacons;
- SAR components of constellations will be fully interoperable;.



Cospas-Sarsat

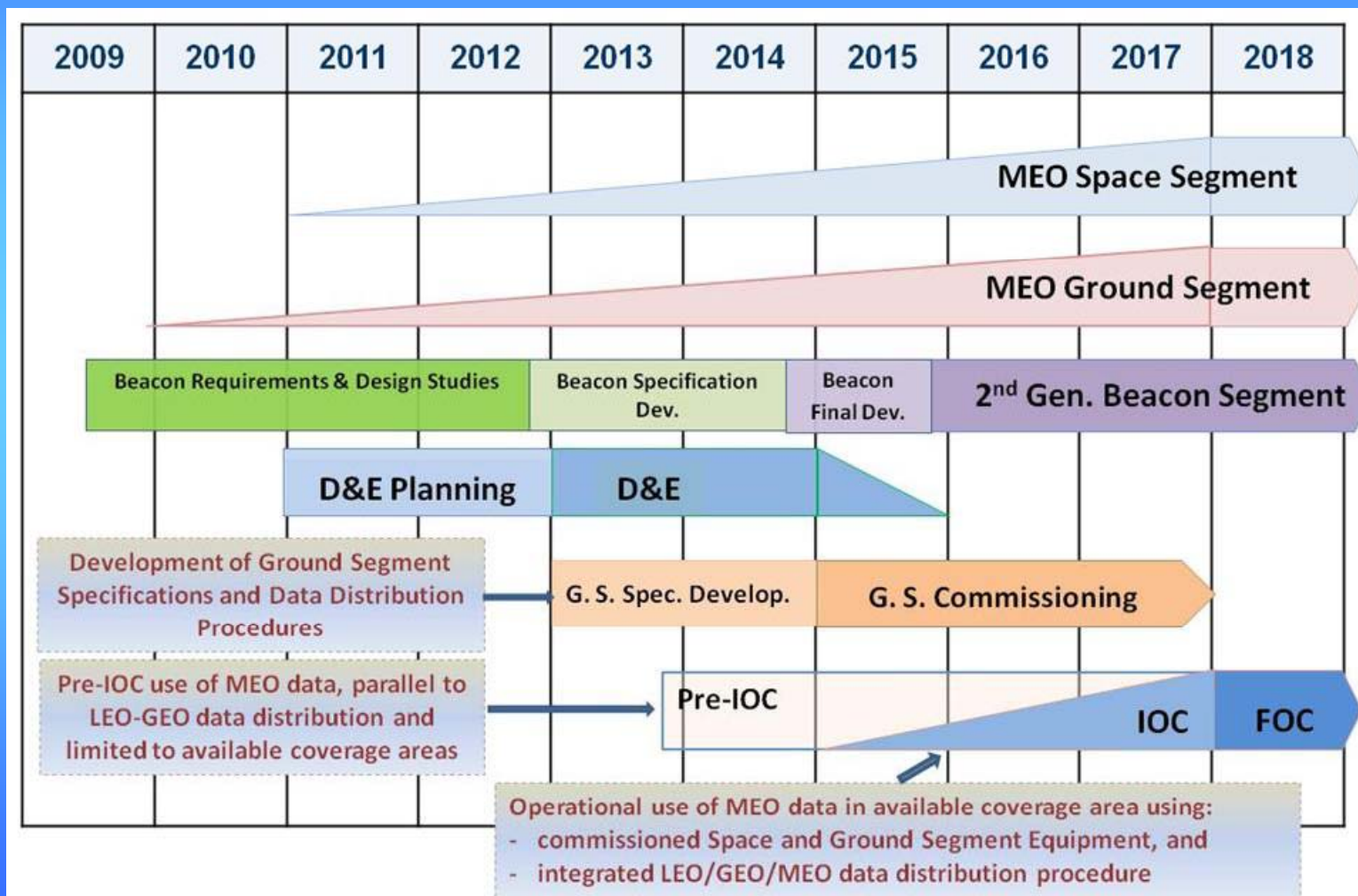
406 MHz MEOSAR RLS System Concept





Cospas-Sarsat

Tentative MEOSAR Implementation Schedule



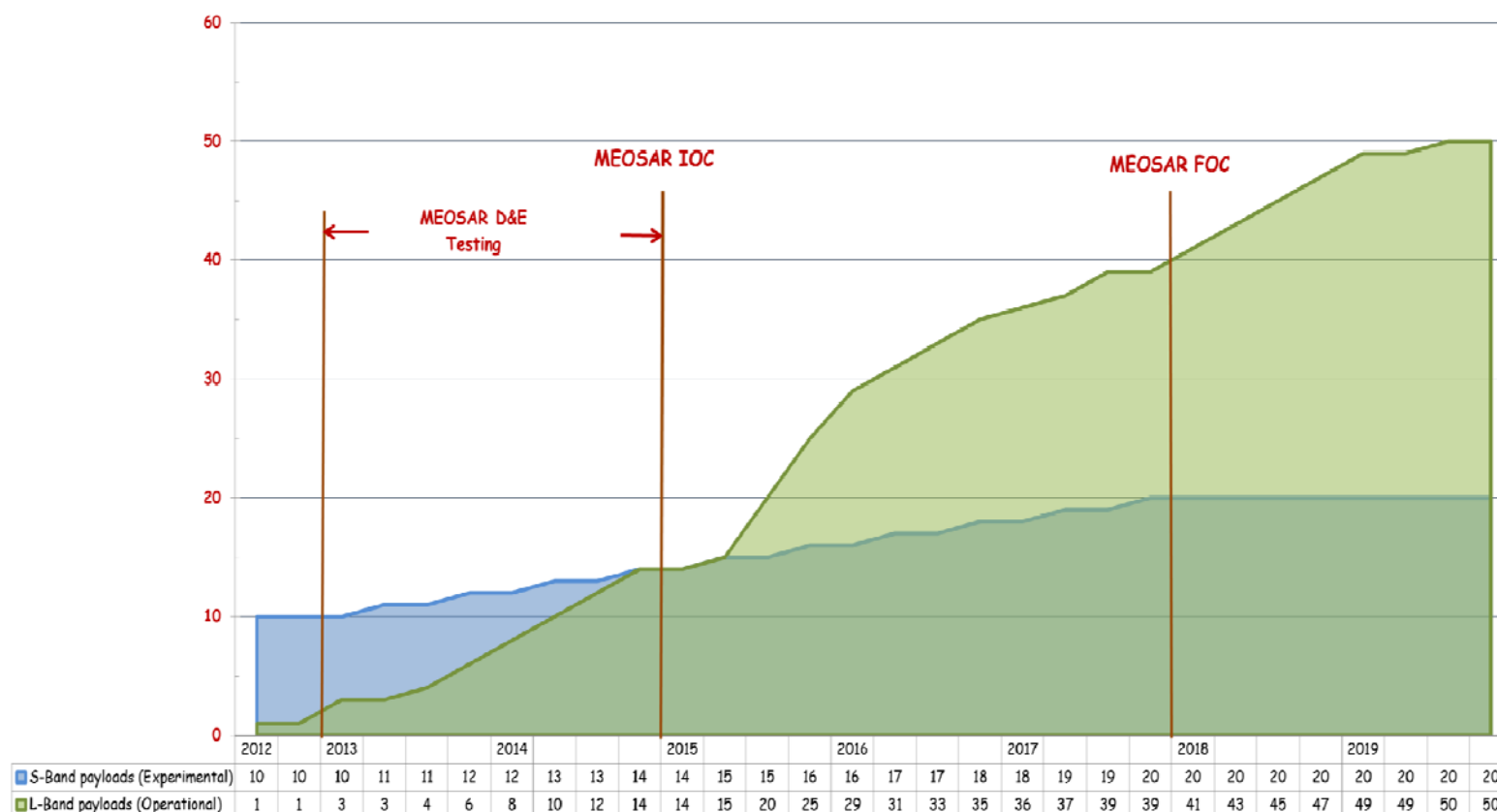


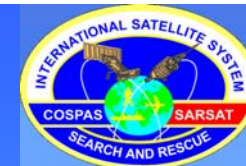
Cospas-Sarsat MEOSAR Space Segment Status

- Currently 10 DASS POC payloads (S-Band) in orbit, used by Cospas-Sarsat Participants for MEOSAR system development. 10 more payloads expected to be deployed by 2018.
- One operational MEOSAR payload (Glonass K) launched in early 2011 . A second one is expected to be deployed at the end of 2012. A total of 50 payloads planned to be deployed by the end of 2019.

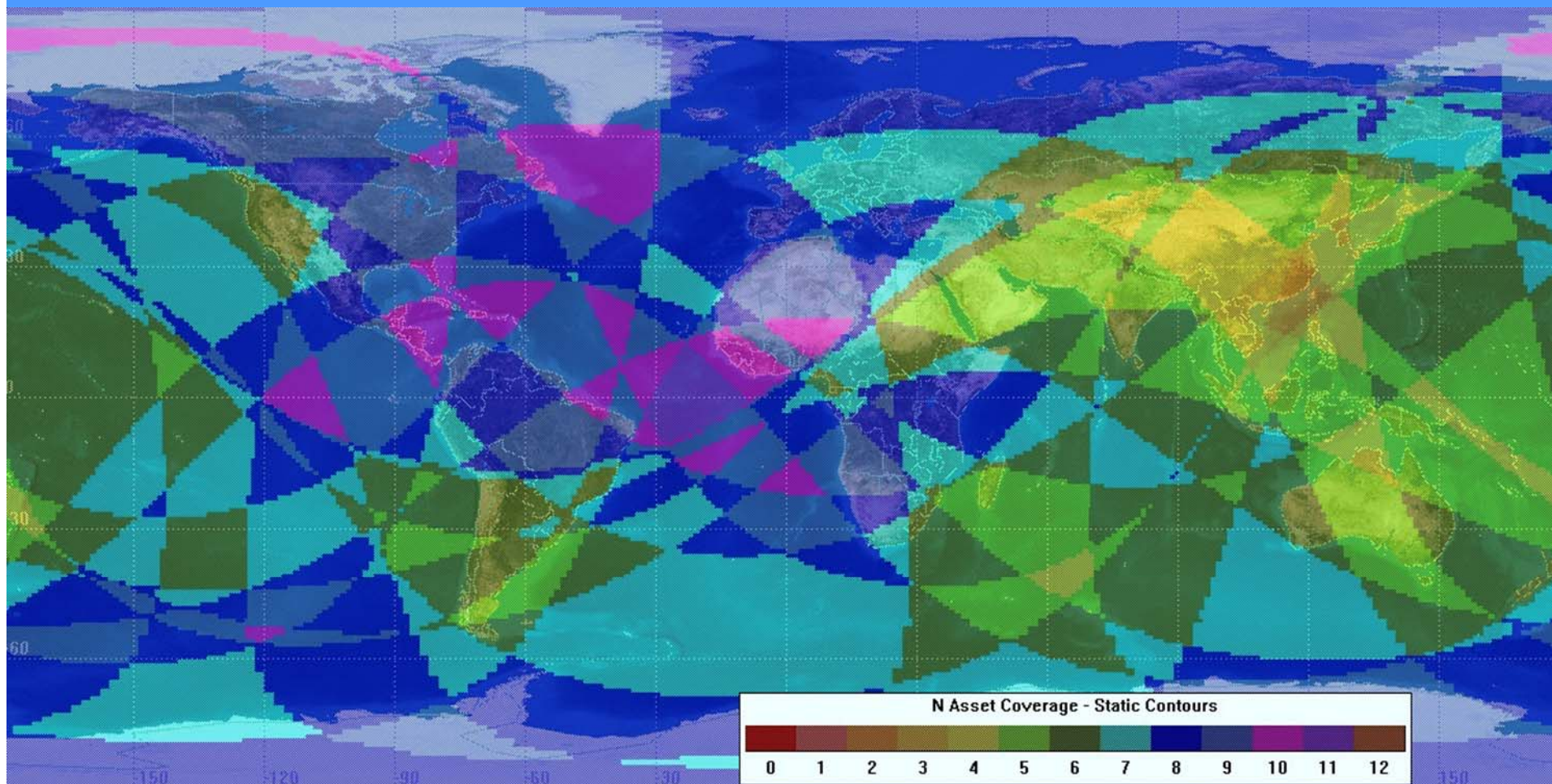


Cospas-Sarsat MEOSAR Space segment



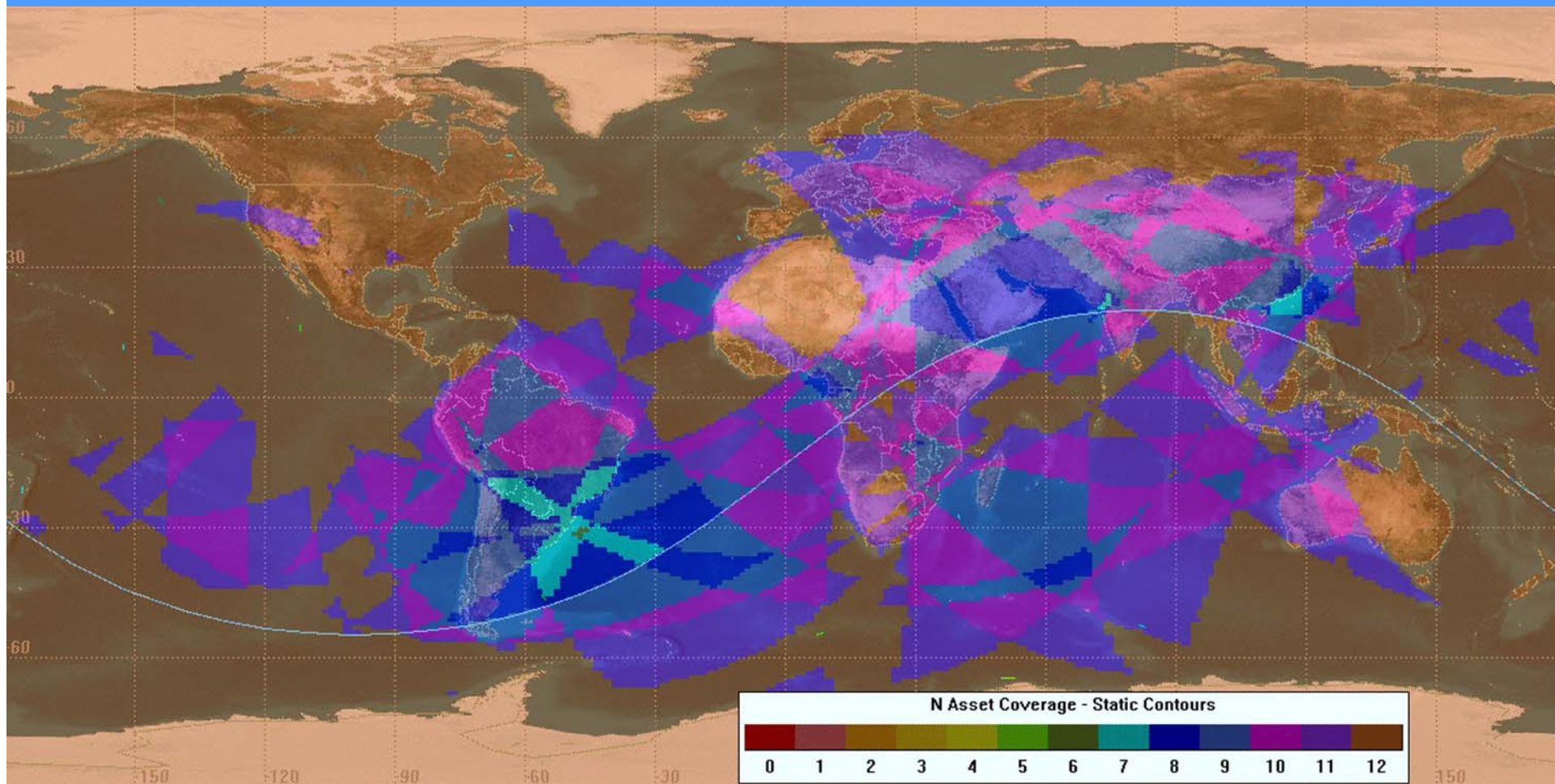


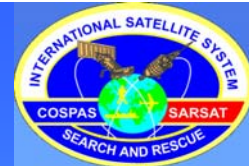
MEOSAR Satellites Visibility around IOC



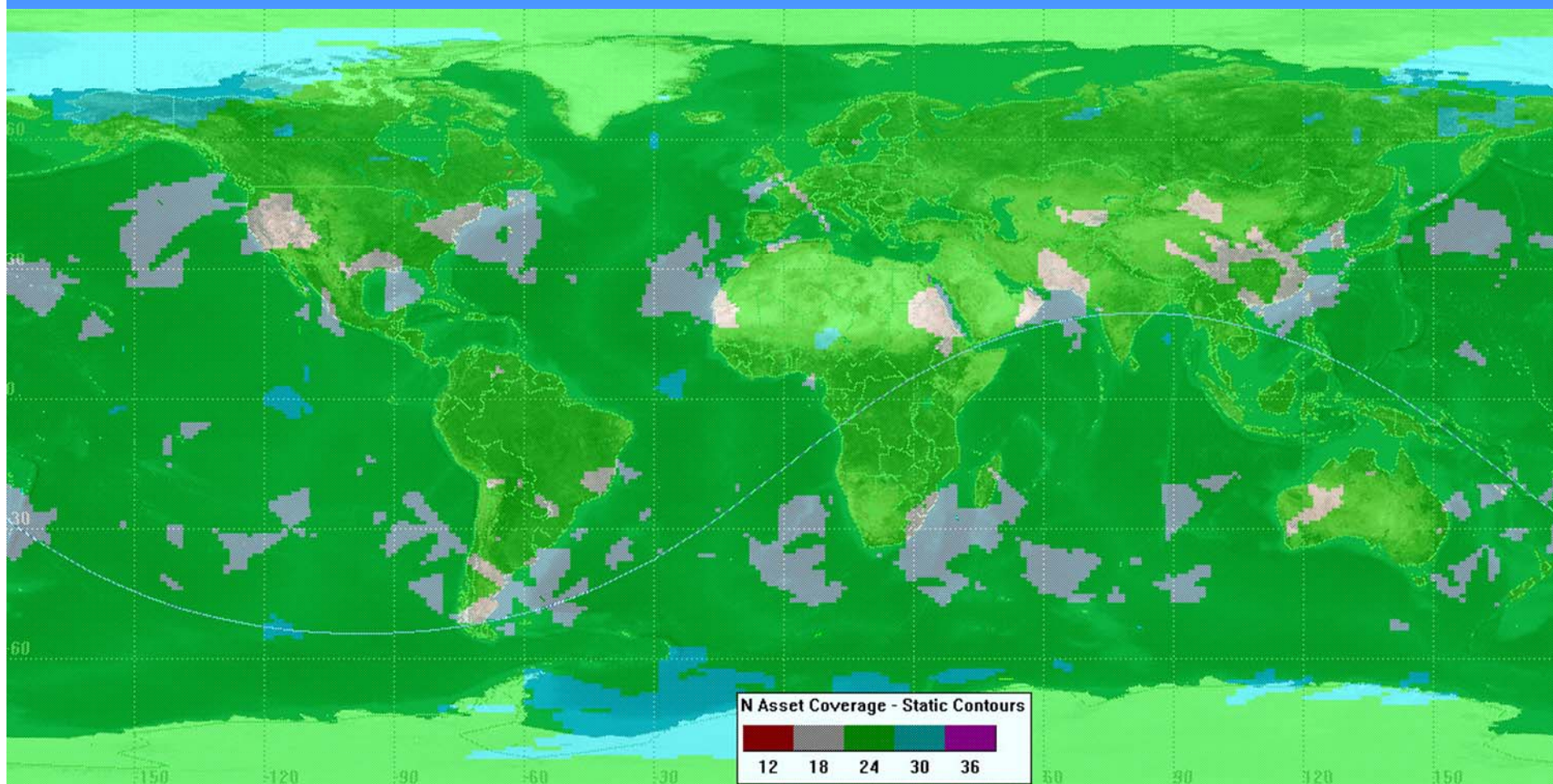


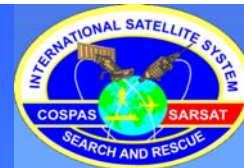
MEOSAR Satellites Visibility around FOC





MEOSAR Satellites Visibility (75 satellites)





Cospas-Sarsat MEOLUT Deployment Status

- Experimental MEOLUTs currently used for MEOSAR testing in:

Brazil, Canada, France, Russia, UK, USA and Turkey.

- Operational MEOLUTs planned to be deployed in:

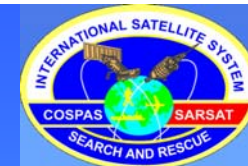
*Australia/New-Zealand (2), Brazil, Canada (2), Cyprus,
France, India, Norway, Russia(2), Spain and the USA(2).*

- Additional MEOLUTs locations expected to be announced in the upcoming years.



Cospas-Sarsat IBRD and Website Recent Developments

- Usage of the IBRD continues to grow, with 31,335 beacons registered as at September 2012, an increase of about 10% over last year's total number of registered beacons (28,000 in October 2011).
- Dual, redundant server sites for the IBRD established in 2012 to ensure that a catastrophic failure at any single data center does not impair IBRD availability (simultaneously affording the same redundancy benefit to the Cospas-Sarsat website).
- The website continued to be a major effort in 2012, in particular, the "SAR Event" input tool was created to allow individual Administrations to input their data via the website by using the online input form or the bulk upload feature.



Cospas-Sarsat Important Upcoming Events and Activities

- Expert Working Group Meeting on 2nd Generation 406 MHz Beacon specification (March 2013 TBC).
- Task Group on MEOSAR D&E phase (Sept 2013 TBC).
- Coordination with ICAO and the FLIRECP on amendments to the annex 6 of the ICAO convention. (new legislation requiring that airplanes carry a means to establish the position of an accident within 6 NM radius)
- Coordination on the protection of the Cospas-Sarsat system from out-of-band/adjacent band emissions of other services (2012-2015).