



SARSAT MEOSAR Status

GPS PNT Advisory Board Meeting

5 December 2018

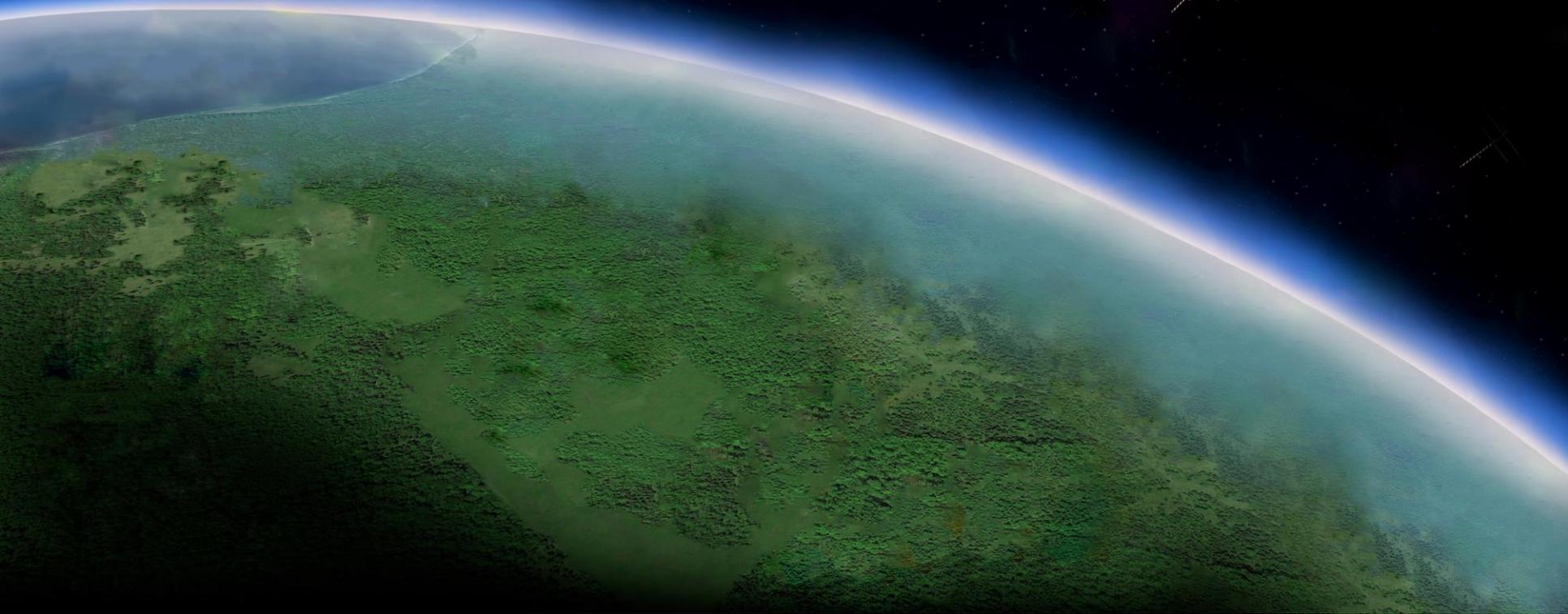
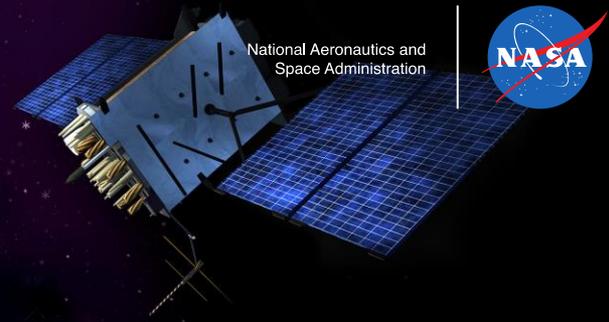
Dr. Lisa Mazzuca

NASA Search and Rescue Manager





MEOSAR CONCEPT OF OPERATIONS





USA MEOSAR status

- **MEOSAR Space Segment**
 - 19 Distress Alerting Satellite System (DASS) Capable Satellites
 - 8 addition DASS capable satellites (GPS III 1-10)
 - DASS is an experimental capability and not dedicated to search and rescue
 - 15 Galileo satellites operational (4 additional in post launch testing).
 - 2 Beidou satellites in post launch testing (new C/S service provider)
- **6-channel US MEOLUTs located at:**
 - USCG Communications Station, Hawaii
 - USCG Communications Station, Florida
 - Holloman AFB, New Mexico – Phased Array under development
 - 4th Gen LEO/MEO LUTS – NOAA placing additional combined LEO/MEO 17 additional international MEOLUTs operational

SARSAT Beacon Totals

More than 598,773 US beacons in the USA registration database as of November 7, 2018

- 107,868 ELTs
- 254,736 EPIRBs
- 244,906 PLBs
- 263 SSAS

Estimated worldwide beacon population is approximately 2,000,000



COSPAS-SARSAT Rescues

As of November 1, 2018
297 Rescues so far in the United States during
Calendar Year 2018

Rescues at sea: 182 people rescued in 60 incidents

Aviation rescues: 30 people rescued in 14 incidents

Terrestrial rescues: 85 people rescued in 56 incidents



Number rescued world-wide since 1982: over 43,000

Number rescued in United States since 1982: 8,620

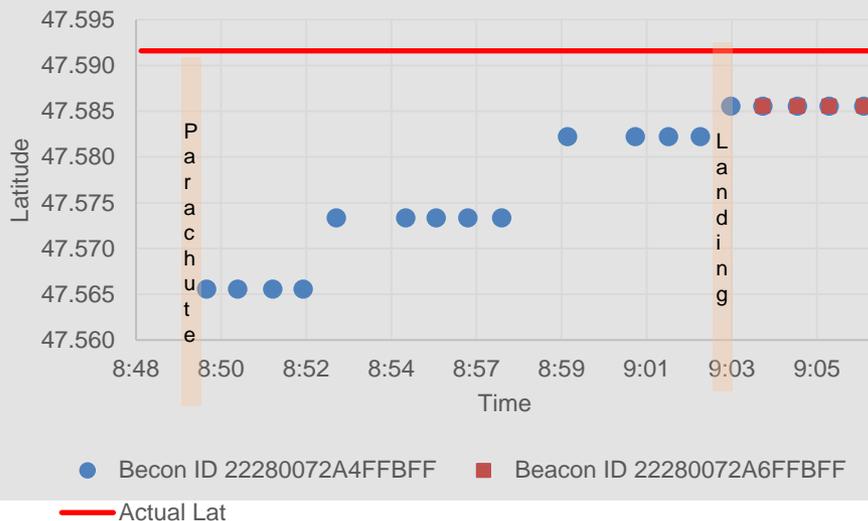


MEOSAR in Action

Soyuz Abort Landing

- Limited data from the Low Earth Orbit Local User Terminal (LEOLUT)
- No data from Geostationary Earth Orbit Local User Terminal (GEOLUT).
- Only one satellite/one channel (MEOSAR ID 430) produced the NASA MEOLUT packets
- No independent solution data from the NASA SARLab Medium Earth Orbit Local User Terminal (MEOLUT) .

Soyuz Encoded Latitude over time (SARLab MEOLUT)



- Only decoded locations from two beacons.
 - Beacon one - activated at parachute deployment
 - Beacon two - activated at Soyuz capsule landing
- Location error 1685 meters

Advance Next Generation Emergency locator (ANGEL)

- Blended team of GSFC and JSC engineering staff responsible for operational requirement development and prototype design representing eventual flight unit
- Develop Second-Generation Beacon (SGB) for the NASA Orion crew survival
- Attached to astronaut Life Preserver Unit (LPU)
 - For operation after splashdown and crew egress from capsule
 - Targeting Exploration Mission 2 (EM-2)



- ACR manufactured and delivered three Qualification units
 - USCG/NASA/US Army Electronic Proving Ground (EPG) currently testing two units for COSPAS/SARSAT approval of SGB specifications and testing standards and acceptance of SGB type approval test facility certification
 - JSC/GSFC are performing field testing with the third delivered unit
- Delivery of thirty beacons to the Orion program is scheduled Jan 2019.
- The ANGEL beacons will be internationally certified in mid 2019 for use and will be the first commercially produced second-generation beacons in the world.



SAR/GPS Instrument Status

- USAF awarded contract for 22 GPS IIF satellites to Lockheed Martin
- SAR/GPS repeater payloads scheduled to fly on SV11-32
- USAF and NASA working closely with Canadian DND counterparts
 - DND anticipated prime contract award - Summer 2019

