

# **Ocean Surface Topography Constellation – Status Report Used at WGCV-30 May 09**

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# Status of the Constellation

- **Altimeter missions in orbit**
  - ENVISAT – performance OK
  - Jason 1&2: tandem flight has demonstrated its value. Jason-1 has orbit has been changed to optimise coverage and benefits of the missions
  - GFO – mission ended; satellite to be de-orbited
- **Missions in development**
  - CryoSat-2 – Good progress for launch in late 2009
  - SARAL – Launch first semester 2010 – Discussion CNES / ISRO / EUMETSAT for operational delivery of data to users

# Status of the Constellation

- Missions in development
  - HY-2A – CNES/SOA negotiations re: DORIS; launch in June 2010. NOAA and EUMETSAT have also approached SOA to guarantee operational access to data
  - Sentinel-3A (2012) and -3B approved at last ESA Ministerial Council
  - EUMETSAT will operate these missions and make data available to users
- Missions in planning
  - Jason-3 – Expected to be approved by the end of 2009 as a continued EU – US cooperation
  - Jason-CS (J3 Follow-on) – ESA, EC, EUM are consolidating programmatic and funding approach for a series of Jason-3 Follow-on satellites

# The Past 15 Years of Satellite Altimetry

- The "Purple Book" (*The future of space-borne altimetry: Oceans and Climate Change*, edited by C. Koblinsky, P. Gaspar, and G. Lagerloef, 1992) served as the strategic planning reference document for altimetry in the past 15 years.
- This strategy came to fruition in the early 2000s: the combination of ENVISAT, Jason-1/2, Topex/Poseidon, ERS-2 and GFO allowed high-resolution mapping of sea surface height variability and demonstrated the capability of multi-satellites altimetry to monitor meso-scale variability and to feed ocean models, paving the way for operational oceanography.
- Time is now ripe for the establishment of a new high-level mission requirements document in pace with the long-term strategy for ocean altimetry (CEOS Recommendation in Assmannhausen)

# Next 15 Years of Satellite Altimetry

- Taking into account
  - The successful launch of Jason-2/OSTM in June 2008, and the continuing operation of Jason-1 and Envisat, these missions working as a Constellation
  - The recommendations from the ESA-CNES Symposium held in Venice, Italy, in March 2006
  - Their refinement with regard to sea level monitoring at the UNESCO Workshop held in Paris, France, in June 2006
  - The additional recommendations for the user workshop held in January 2008 in Assmannshausen, Germany
- EUMETSAT and NOAA have initiated a study which aims at using these series of recommendations based on well-established user requirements to derive an upper-level Mission Requirement Document that would guide future programme planning for the operational oceanography user community in the 15-years to come

## Study content and approach

- The study is led by the French company CLS (Dr P. Escudier) and involve the contribution of Dr J.-L. Fellous (co-president of JCOMM). Both experts have been deeply involved in past altimetry missions over the last 25 years.
- The study will include extensive consultation with other experts in the various application fields of altimetry, e.g.:
  - Large-scale ocean circulation
  - Sea level monitoring (climate-quality)
  - Intra-seasonal to inter-annual variability
  - Meso-scale and coastal oceanography
  - Tides
  - Marine meteorology
  - Inland and ice studies, geodesy and geophysics
  - Operational ocean forecast and services

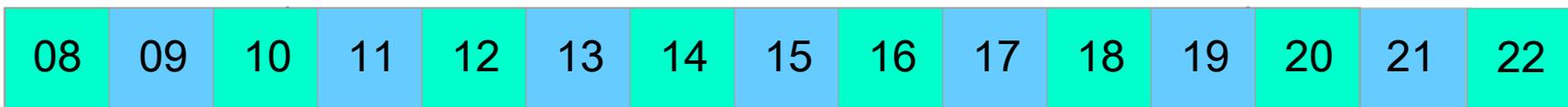
## Study Timetable

- A first draft of the study report was delivered to EUMETSAT and NOAA on January 31, 2009
- The draft report builds on previous documents and on a first set of interviews expressing user requirements in priority areas
  - Operational oceanography (G. Brassington, W. Graham)
  - Sea level (A. Cazenave)
  - Meso-scale circulation (R. Morrow)
- A second set of interviews and a review will now take place, so that a refined draft report is available on 31 March
- This second draft will be subject to an international review and endorsement process, culminating with the next Ocean Surface Topography Science Team meeting in Seattle, WA, June 22-24, 2009
- The final document should be available in mid-July 2009

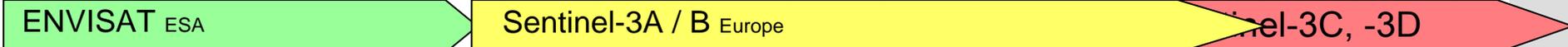
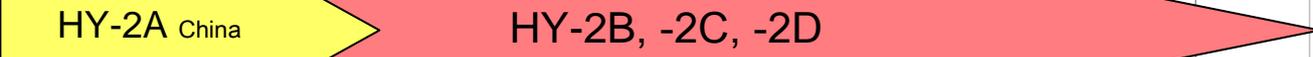
## Requested SIT and CEOS Support

- Be prepared to respond and get validation of the Mission Requirements Document for the Constellation when it becomes available (March 2009)
- Continued support to secure funding for Jason-3 in time to provide continuity of the Jason-quality data stream, in addition to recurrent units for high-inclination Sentinel-3 mission
- Engage key officials of the State Oceanic Administration to collaborate in altimetry - to extend data availability beyond that available from existing constellation

# Ocean Surface Topography Constellation Roadmap



## SSH from high-inclination sun-synchronous orbit



## Swath altimetry from high-inclination orbit (several orbit options)



## Reference missions, SSH from low inclination orbit,



In orbit

Approved

Planned/Pending approval

Needed