CryoSat Mission and Data Products after 10 Years of operations

cryosat

→ ESA'S ICE MISSION

esa

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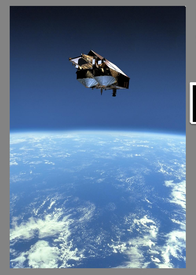
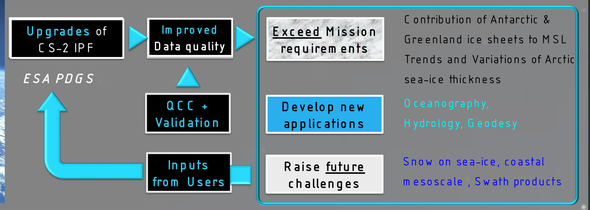
→ CryoSat Mission in a nutshell

➢ Mission Challenges



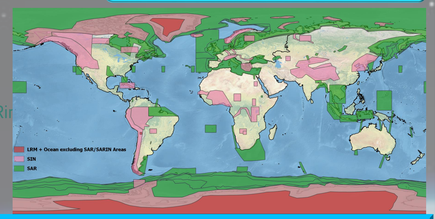
Better understand how the mass-balance of the land-ice & sea-ice is changing… but not only



➢ SIRAL instrument and geographical Mode Mask

Ku-band altimeter operating in 3 modes, function of a geographical mask (SARin/SARin LRM/LRM,SAR)

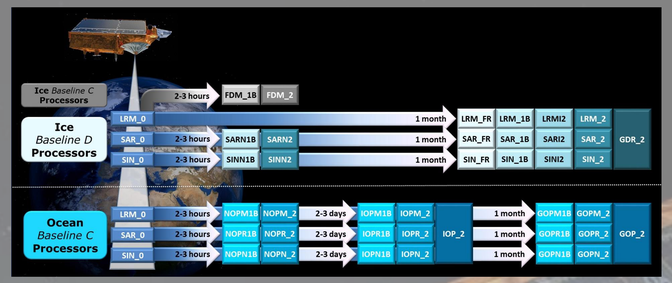
New Mask Released in August 2019



CryoSat 10th Year Anniversary Science Conference
5-8 October 2020
www.cryosat10years.org

→ Current ESA CryoSat Products

➢ CryoSat data processed both over ocean and ice surfaces



- **Ice Products** to achieve the mission objectives / Generated with Baseline-D since May 2019
  - → New NRT chain with 2-3 Hrs latency operational since beginning August 2019
  - → Reprocessing of Ice Baseline-D data completed
- **Ocean Products** since April 2014 / Generated with Baseline-C since November 2017 / Contain ocean parameters optimized for scientific & operational applications
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To access CryoSat data, contact: eohelp@esa.int

→ ESA Quality-Control and Validations

➢ CryoSat data QCV both over ocean and ice surfaces

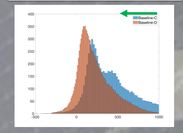
- **Routine QC and Instrument performance** (IDEAS+): Status Nominal
- **Monitoring of internal Cal** (ARESYS): CAL stable since the beginning of operations
- **External Calibrations at Transponders** (IsardSat): Biases corrected in Baseline C
- **Ocean QCV** (TUDelft+NOC): Products agreed / exceed reference ocean missions – see Calafat et al (2017, RSE)
- **CryoSat Performance Monitoring of ice data** (MSSL): most of known issues resolved with Baseline C
- **CryoSat SciEnce-oriented data ANalysis over sea-ICE areas** (AlongTrack, AWI, LEGOS, CLS) : Started

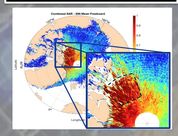
To access to CryoSat QCV Reports, visit: https://earth.esa.int/web/sppa/mission-performance/esa-missions/cryosat/

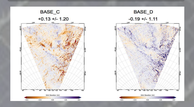
→ CryoSat ICE Baseline-D Improvements

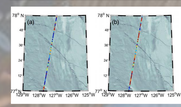
Baseline-D Evolutions and Improvements

- NetCDF-4 Format
- Baseline-C Issues Fixed
- Freeboard SNR Improved
- Freeboard in SARIn Patches
- New Slope Model for Antarctica and Greenland (LRM)
- Lead Detection Based on stack peakiness









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→ CryoSat Product Evolutions

Why ? Increase significantly the number of CryoSat end-users
When ? First Land Ice Cryo-TEMPO Swath operational from May 2020
What ? Simplified – Thematic – Rapidly evolving ESA products

Why ? Improve CryoSat products over the Sea ice and Land ice
When ? Operational in 2021 | Reprocessing planned for 2021
What ? NetCDF | Improved Retrackers and corrections + New fields

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→ Conclusion and Perspectives

➢ ESA Current CryoSat product status

- **Ocean Baseline-C Products** : Nominal / Suited for oceanographic application Associated full Reprocessing completed
- **Ice Baseline Products** : Exceed initial mission requirements / Ice Baseline-D in operation since 27th May 2019 and full mission reprocessing completed

➢ Mid/Long-term perspectives

- Freezing of the requirements for L1 and L2 **Baseline-E** implementation.
- First **Cryo-TEMPO SWATH** operations and reprocessing.
- Develop other **CEOS/QA4EO** compliant **CryoSat Thematic Products (polar ocean, sea ice, hydrology)** to be used by non altimetry experts (e.g. Climate scientist) and generate easily accessible multi-thematic products including **uncertainty** and **traceable quality indexes**.
- Enhance the use of CryoSat in creating interactions with multi-thematic communities & international programs to support the preparation of a potential **Copernicus S-9/CRISTAL** *Polar Topography mission for Ice & Snow*

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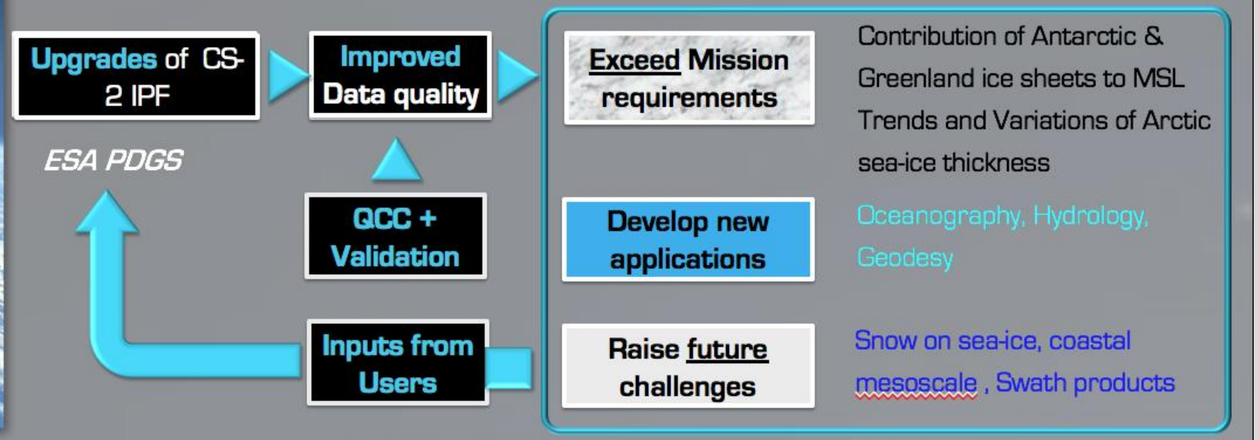

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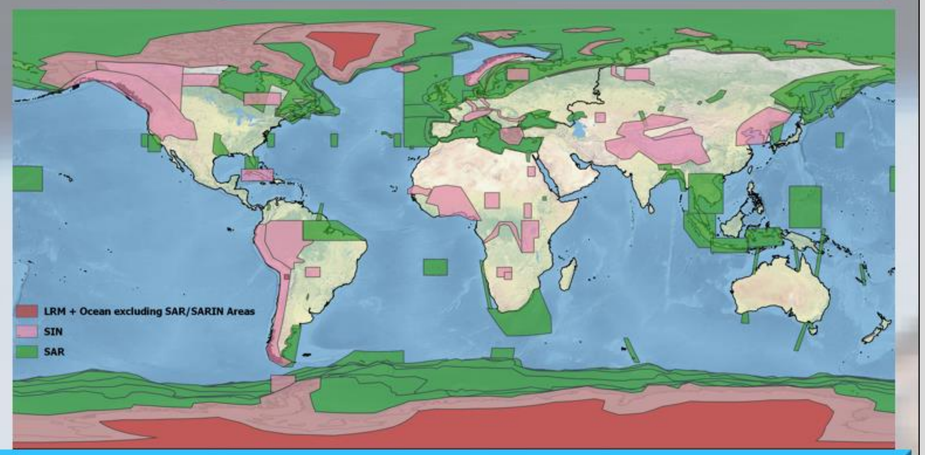

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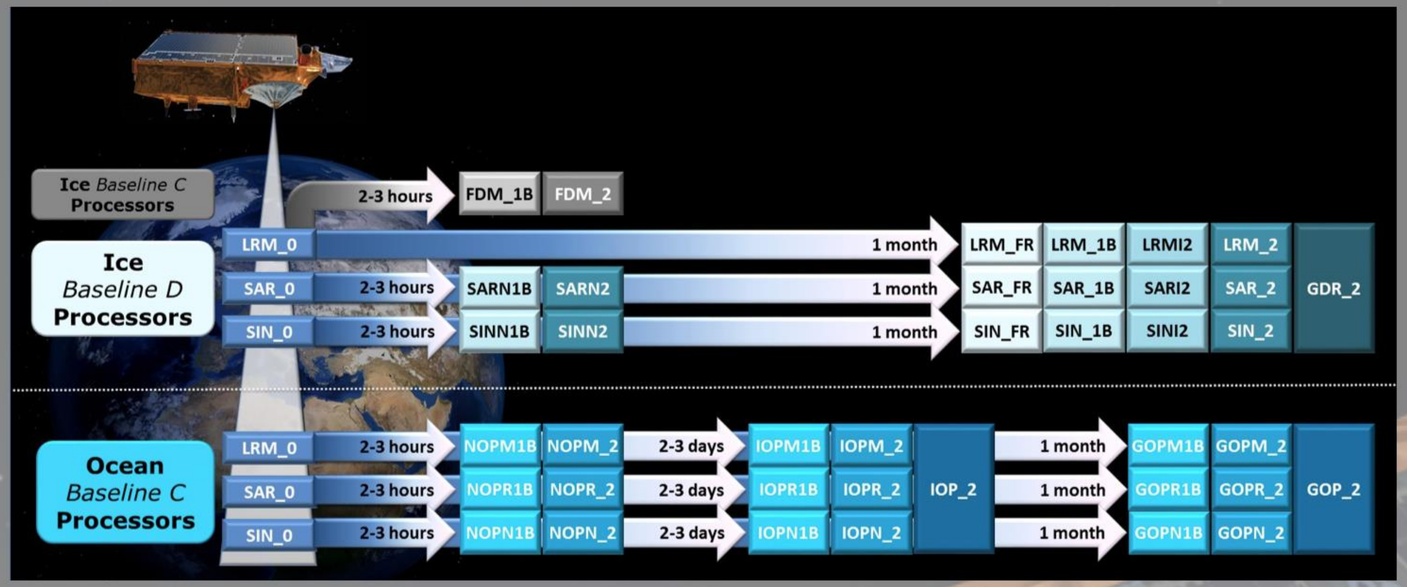

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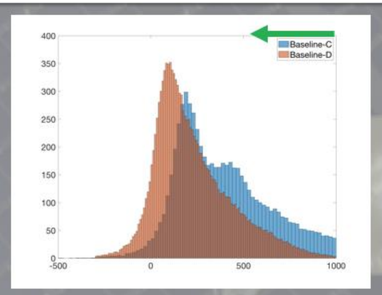

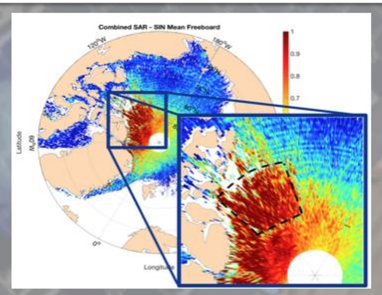

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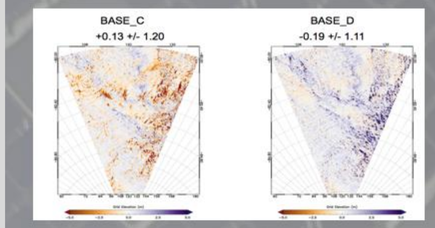

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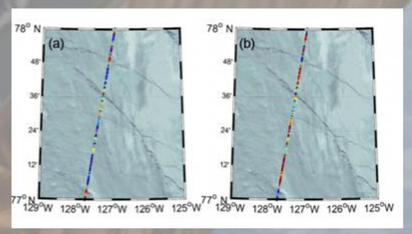

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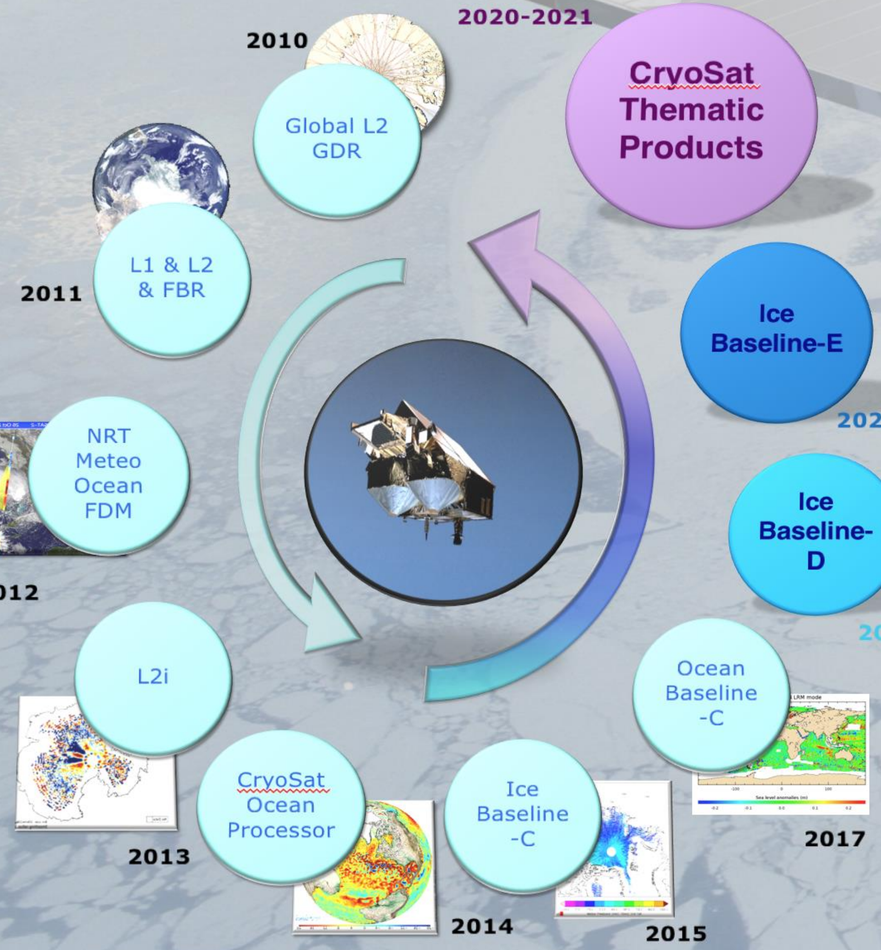

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