NOVELTIS

Innovating to protect our World's Life

SCOOP Science review

WP6000 – Coastal zones

Sea state impact on altimeter retrieved SSH

afaq ISO 9001 Qualité AFNOR CERTIFICATION

26/01/2016

WP6000 – Coastal zones

- NOVELTIS contribution
  - Stability of the altimeter SSH

    →Altimeter absolute bias, drifts, geographically correlated errors, local coastal performances *(regional CALVAL method)*

  - Sea state impact on the altimeter SSH

    → Sensitivity of the altimeter SSH bias to the major sea state components (HS *(SWH)*, HS0, HS1, HS2, HS3, wind speed…)

WP6000 – Coastal zones

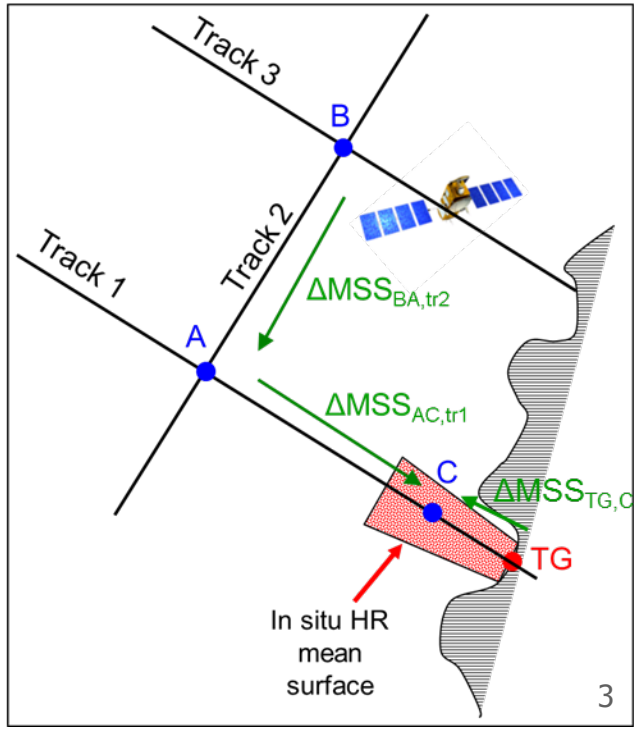
- Stability of the altimeter SSH
  - Altimeter absolute bias, drifts, geographically correlated errors, local coastal performances *(regional CALVAL method)*

➔ SCOOP project:

→ Verification of the SSH stability at the coast in SAR mode for CryoSat-2 (or Sentinel-3): implementation at Harvest

→ Evaluation of the wet tropospheric correction(s)

➔ New SAR-mode zone at Harvest for CS2



WP6000 – Coastal zones

- Sea state impact on the altimeter SSH
  - Harvest: mainly governed by swell
  - Inputs:
    - Altimeter SSH bias
    - Sea state parameters: HS, HS0, HS1, HS2, HS3, wave direction, skewness, period…
    - Wind speed

    → regional CALVAL method
    → Model (IOWAGA)/buoys
  - Statistical analysis:
    - Correlations
    - Principal Components Analyses (PCA),…

Sea state impact on the SSH

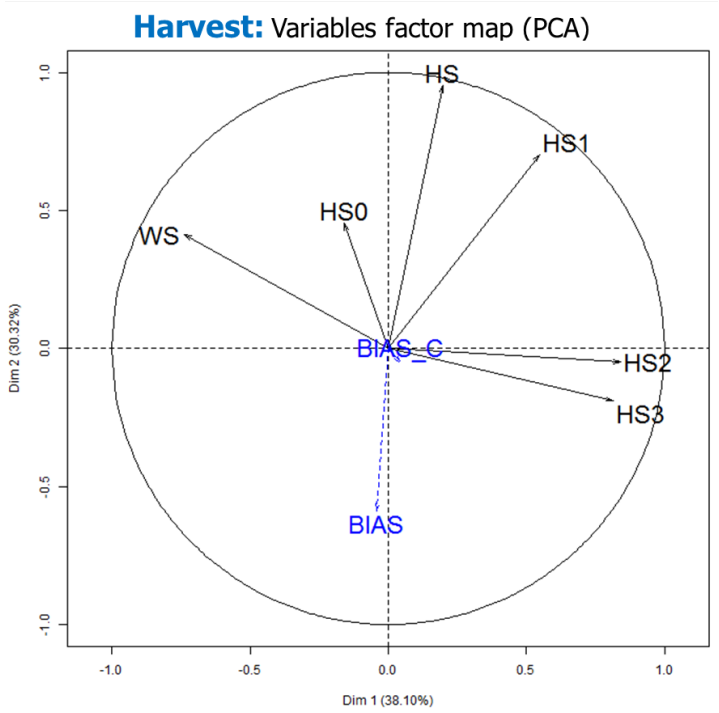
- An illustration with Jason-2...
  - Parameters available in the IOWAGA hindcast database:
    - Total HS
    - HS0: wind waves
    - HS1, HS2, HS3: main swell components
    - Wind speed in some cases (Harvest OK)

→ Harvest : regional grid, 0.16°x 0.16° 3 hours

→ Evaluation of the sensitivity of the altimeter SSH bias to these parameters

→ Correlations between the parameters

→ Principal Component Analysis (PCA)



WP6000 – Coastal zones

- NOVELTIS team
  - Altimetry experts: Mathilde Cancet and Eric Jeansou
  - Wave expert: Chafih Skandrani
  - Met-ocean statistics expert: Romain Bergougnoux

  + collaborative support from NASA/JPL at Harvest site (Bruce Haines)

WP6000 – Coastal zones

- Inputs needed
  - CryoSat-2 SAR data at Harvest (new SAR-mode zone)

or

  - Sentinel-3 SAR data at Harvest

  - Wet tropospheric correction(s) to be evaluated
  - SSB correction(s) to be evaluated
  - Harvest tide gauge SSH time series (provided by NASA/JPL)
  - IOWAGA hindcast database (provided by IFREMER)