

# Regional and Global CAL/VAL for Assembling a Climate Data Record Splinter summary

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# **Regional Calibration/Validation**

**Wednesday, October 9, 2013**

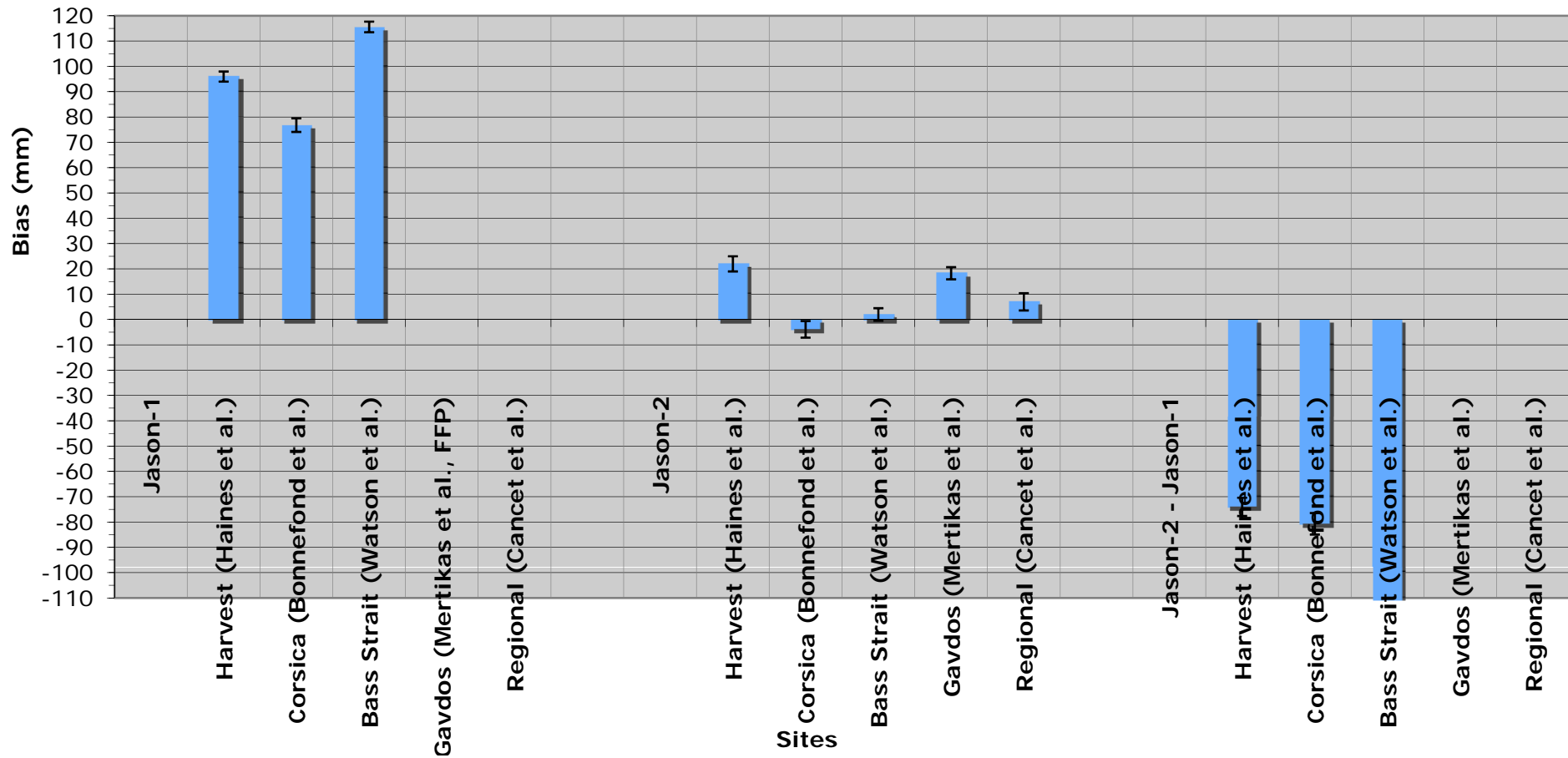
6 oral presentations.

4 poster presentations.

# Local Cal/Val summary report

- **Ensemble results from dedicated sites and regional campaigns indicate:**
  - Current Jason-2 (GDR-D) SSH unbiased or slightly biased (questionable significance)
  - Current Jason-1 (GDR-C) SSH bias high by  $\sim 10$  cm, but upcoming Poseidon-2 range corrections (altimeter internal path) expected to reduce bias to near zero.
  - Legacy (T/P) systems unbiased
  - First SARAL/AltiKa results support that altimeter measures slightly long ( $\sim 5\text{--}6$  cm).
- **Unusual estimates of Jason-2 drift from dedicated sites warrant investigation**
  - Significant ( $\sim 5$  mm/yr) with opposing signs at different sites
  - Raises questions on regional stability of altimetric measurements, but also on the stability of the in-situ observations (of water level and vertical land motion).
- **Comparisons to ARGO and tide gauges providing valuable new insights on stability.**

# In-Situ Bias Estimates for Jason-1 and Jason-2



# **Global Calibration/Validation**

## **Wednesday, October 9, 2013**

6 oral presentations.

11 poster presentations.

# Global Cal/Val summary report

- **Jason-1 and Jason-2 Missions**

- Jason-1 and Jason-2 data coverage and quality are excellent.
  - Sea surface height error < 4 cm for temporal scales less than 10 days.
  - GMSL comparisons to tide gauges < 0.3 mm/yr (with updated Jason-1 data)
- Jason-2 GDR version D reprocessing 100% complete.
  - Range bias reduced to < 1 cm, and time tag error eliminated.
  - Orbit accuracy < 1 cm.
    - Improvements to orbit accuracy (JPL orbit) reduce SSH crossover variance by ~40 mm<sup>2</sup>.
- Jason-1 GDR currently available in GDR-C version only.
  - Potential range bias of 6 mm in geodetic mission relative to repeat-track mission.
  - Radiometer wet troposphere correction found to have increase in attitude dependent errors after Feb, 2013 safehold.
    - Recalibration applied to GDR products reduces these errors.
  - Numerous improvements to GDR-C products shown to improve quality of data and consistency with Jason-2:
    - Range bias due to error altimeter internal patch calibration.
    - Time tag error (transmit and receive time of echos)
    - Orbit (GDR-C to GDR-D standards), and weighting of DORIS stations in SAA.
    - Sea state bias model.
    - An end-of-mission dedicated recalibration of radiometer has started.

# Global Cal/Val summary report

- **SARAL Mission**

- Data quality meeting missions requirements.
- Excellent data coverage, slightly better than Jason-2.
  - Missing measurement due to rain is significantly less than anticipated.
- SSH crossover variance is similar to Jason-2 even with initial test GDRs.
- Range noise is lower than Jason-2.
- Range bias of ~ 6 cm.
- Improvements to initial data expected to provide additional improvements to quality of data products.
  - Sea state bias, radiometer wet troposphere correction, sigma0 atmospheric attenuation, wind speed, orbit.

- **Cryosat**

- Very promising in both LRM and SAR modes.

- **HY2A**

- More work required, especially to improve long-term stability.

# Cal/Val round-table discussion

- Recommendations:
  - **TOPEX reprocessing is high priority to benefit from 20-year record.**
  - Cal/Val should be approached from multi-mission perspective.
    - Provides means to develop new standards for data products.
      - POD, retracking, sea state bias.
  - Further development of regional calibration techniques
    - Include other missions.
    - Expose errors impacting calibration of reference (Jason) missions.
  - Continue to develop approaches to improve long-term stability of radiometer wet troposphere delay measurements.
    - Significant source for limitations in long-term stability.
  - Concerted effort to characterize and reduce systematic in-situ errors.
    - Working group for in-situ measurements, and exchange of data.
  - Further investigation of potential altimetric sources for unusual Jason-2 drift estimates.