

# Recommendations for the Future of Coastal Altimetry

P. Cipollini and the COASTALT Team



COASTALT

# A list of recommendations...

- ...that we have come up with at the end of the COASTALT Project (summer 2011)
- these are by no means exhaustive and are presented here with the sole purpose of **stimulating further discussion.**
- ...and ideally, we should come up with a refined/better list at the end of this Workshop.



# Recommendation 1

- Further work is needed on the **retrackers**, both theoretical and in terms of optimization and inter-calibration
  - “Theoretical” means improvement of the existing models (eg, by including the effect of white caps) or the development of new models (eg scattering from non-linear surfaces).
  - “Optimization and intercalibration” includes not only runtime optimization, but, most importantly, an assessment of biases and other differences amongst different retrackerers, and the development of a criteria for retracker selection



# Recommendation 1 (cont.)

- We believe that an international exercise for the intercalibration of the various retrackerers would be extremely beneficial and that the Space Agencies should support this



# Recommendation 2

- **Innovative retrackers** (which use information in adjacent waveforms) **need further R&D** to move from concepts to simulations and eventually confrontation with real data
  - This is a most promising field, already identified in Phase 1 and the difficulties in the development and implementation of some of the ideas tested (Bayes Linear Retracker, 2-D retracker) should not deter from pursuing further development, with the hope of achieving a full validation of these innovative techniques.



# Recommendation 3

- To facilitate the work of developers, testers, and the uptake of the data by ‘expert users’, **coastal altimetry processors must be open**, flexible, expandable, easily upgradable and fully documented.



# Recommendation 4

- The issue of **filtering of the various corrections** needs to be revisited. Correlation scales must be clearly identified and data screening and filtering schemes clearly recommended [these may depend on the application to some extent]
  - A good example is the work carried out in D2.4 regarding the correlation scales for the tropospheric corrections. But other corrections that crucially need a better assessment of the optimal filtering scheme are the ionospheric and the SSB.
  - A related issue is to see which corrections, if any, need to be computed at full rate (18Hz) and which can be interpolated from lower rate data



# Recommendation 5

- The **SSB correction** should be reassessed in the coastal zone, with investigation of specific models
  - This is a recommendation is the outcome of agreement at the various Coastal Altimetry workshops and is perceived as scientifically challenging, but conducive to very useful results.





# Recommendation 6

- **Validation** is crucial and should be supported further
  - developing consistent validation protocols and assessments that can be applied to a number of locations with varying geographical and oceanographic conditions.



# Recommendation 7

- The techniques developed in COASTALT, PISTACH and similar projects, and the relevant processors, should be extended to ensure **multi-mission and multi-domain capability**.
  - In particular to the new and forthcoming Delay-Doppler altimetry missions (Cryosat-2, SRAL on Sentinel-3) and to AltiKa, which have intrinsically better capabilities in the coastal zone.
  - This multi-mission capability is one of the objectives, for instance, of the follow-on work to COASTALT in the ESA DUE eSurge project, which has just started (June 2011).
  - we need to work closely with the ice & inland waters communities



# Recommendation 8

- Coastal Altimetry **applications should be supported and encouraged**, with easy data access, outreach and training activities, and demonstration studies
  - The eSurge project is a clear example of the transition to applications, but several other possible applications are listed and described in the OceanObs'09 Community White Paper on Coastal Altimetry (Cipollini et al, 2010)

