

The COASTALT project for coastal altimetry and its contribution to the monitoring of coastal sea level

Paolo Cipollini(1), Susana Barbosa(2), Christine Gommenginger(1), Joana Fernandes(3), Jesus Gomez-Enri(4), Cristina Martin-Puig(5), Stefano Vignudelli(6), Philip Woodworth(7), Jérôme Benveniste(8), Luisa Bastos(3), Val Byfield (1), Peter Challenor(1), Salvatore Dinardo(9), Scott Gleason(1), Clara Lázaro(3), Bruno M. Lucas (9), Laura Moreno(6), Alexandra Nunes(4), Nelson Pires(4), Graham Quartly(1), Andrea Scozzari (6), Helen Snaith(1), Mikis Tsimplis (1), Judith Wolf (8)

(1) Ocean Observing and Climate, National Oceanography Centre, Southampton, U.K. (cipo@noc.soton.ac.uk), (2) University of Lisbon, IDL, Lisbon, Portugal, (3) Faculdade de Ciências, Universidade do Porto, Portugal, (4) Universidad de Cádiz, Spain, (5) Starlab Barcelona S.L., Barcelona, Spain, (6) Consiglio Nazionale delle Ricerche, Pisa, Italy, (7) Proudman Oceanographic Laboratory, Liverpool, U.K., (8) ESA/ESRIN, Frascati, Italy, (9) SerCo/ESRIN, Frascati, Italy, (10) Deimos/ESRIN, Frascati, Italy

In the last couple of years the major space agencies have actively supported research and development of altimetry in the coastal zone, with projects like PISTACH funded by the French Space Agency (CNES) and COASTALT funded by the European Space Agency (ESA). In this presentation we will focus on the COASTALT Project, which paves the way to the reprocessing of coastal altimetry data from ESA missions. COASTALT has delivered a number of key contributions to the advancement of the coastal altimetry and has gained visibility within the lively international community of researchers involved in the development of this novel topic.

In this talk we will first review what COASTALT has achieved so far, namely:

- the project has surveyed the potential user base and identified the requirements for coastal altimetry product composition, posting rate and format;
- the project has reviewed the whole spectrum of corrections which need to be applied to the altimetric datum, highlighted the specific problems of some of those corrections in the Coastal Zone, and identified possible solutions and issued the relevant recommendations on which corrections should be applied or investigated further. A particular and completely original contribution by COASTALT has been the research on and development of the GNSS-derived tropospheric path delay correction, which answers the pressing need for a more accurate wet tropospheric correction in the coastal zone, where the microwave radiometer-derived correction becomes inaccurate;
- the project has designed and fully implemented a prototype software processor for the Envisat RA-2 SGDRs in the coastal zone, which generates an experimental Coastal GDR (CGDR) product conducive to further research and development in the topic, and also constitutes a first step towards the applications of coastal altimetry. The processor includes a baseline processor that can be run on every pass, plus a User-defined Coastal Geophysical Correction (UCGC) module that allows users to add their own corrections for research and application purposes. In a related task, innovative retracking techniques have been investigated; these will pave the way to the next generation of retrackers;
- in parallel to the development of the processor the project has carried out a full product definition and produced the relevant documentation including a user handbook;
- the project has also investigated the use of the new CGDRs in training and outreach activities via the BRAT toolbox, issuing a series of guideline recommendations.

Then we will discuss how t the COASTALT work is continuing in Phase 2 of the Project, in view of the lessons learned so far, in order to further improve coastal altimetry and promote the full uptake of reprocessed coastal altimetry products by the user community. We will conclude by discussing the contribution that coastal altimetry reprocessed data can give to the assessment of the rate of sea level in the very region where the impacts of changing oceans on society are most severely felt, i.e. the coastal zone.