



Improvement of the Arctic Ocean Bathymetry and Regional Tide Atlas – a CP4O initiative

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CryoSat Plus for Oceans (CP4O) is a project under the ESA STST program which aims to develop and evaluate new ocean products from CryoSat data and so maximize the scientific return of CryoSat over oceans. The main focus of CP4O has been on the additional measurement capabilities that are offered by the SAR mode of the SIRAL altimeter, with further work in developing improved geophysical corrections.

The Arctic Ocean is a challenging region, because of its complex and not well-documented bathymetry, together combined with the intermittent presence of sea ice and the fact that the in situ tidal observations are scarce at such high latitudes. The current initiative initially addresses the bathymetry in the Arctic in attempting to improve altimetric bathymetry using the near 7 years of Cryosat-2 high quality and high resolution "geodetic" SAR altimetry all the way up to 88N. Subsequently the project progresses to use Cryosat-2 in TWO ways for improved ocean tide modelling in the Arctic Ocean. One is to use Cryosat-2 improved bathymetry the second is to use Cryosat-2 derived harmonic tidal constituents for assimilation into a regional tide model.

The project runs during 2017 and in this presentation we will outline the initial steps to evaluate existing bathymetry in the Arctic (R-TOPO₂, IBCAO etc). It will also present the methodology to derive bathymetry from high resolution gravity and present an initial new Arctic bathymetry covering the Arctic ocean up to 88N derived from the high resolution DTU15 marine gravity field derived from Cryosat-2. Secondly this presentation highlights the methodology followed to develop the model and the performances of this new regional tidal model in the Arctic Ocean.