An ocean surface current analysis (GlobCurrent) calibration and validation

Rick Danielson (1), Johnny Johannessen (1), Marie-Hélène Rio (2), Fabrice Collard (3), Craig Donlon (4), Bertrand Chapron (5), and Graham Quartly (6)

(1) NERSC, Bergen, Norway, (2) CLS, Rome, Italy, (3) ODL, Brest, France, (4) ESA, Noordwijk, The Netherlands, (5) Ifremer, Brest, France, (6) PML, Plymouth, England

Observations of extreme conditions, characterized by high heat flux, rapidly changing surface wind, or strong ocean current, are rare. Although analyses provide estimates of these conditions, because there are few observations to begin with, it is difficult to calibrate and validate an analysis using independent observations. This requirement of independence may not be so dire, however, if we acknowledge that analyses are designed to localize the impact of observations. We thus propose that extrapolation from outside the impact (in space or time) of an observation provides great freedom to improve an analysis using a framework provided by triple collocation (Stoffelen 1998). In other words, we seek not only to assess performance, but also to suggest that a more complete analysis or retrieval is one that includes downstream calibration and validation against another high quality reference. The ESA GlobCurrent analysis calibration is given with reference to drifting buoys. Some consideration of appropriate physical quantity to gauge measures of performance across an entire range (including both weak and extreme conditions) is given.