Geophysical Research Abstracts
Vol. 18, EGU2016-15297, 2016
EGU General Assembly 2016
© Author(s) 2016. CC Attribution 3.0 License.

Validation of the EGSIEM combined monthly GRACE gravity fields

Zhao Li (1), Tonie van Dam (1), Qiang Chen (1), Matthias Weigelt (2), Andreas Güntner (3), Adrian Jäggi (4), Ulrich Meyer (4), Yoomin Jean (4), Zuheir Altamimi (5), and Paul Rebischung (5)

(1) Faculté des Sciences, de la Technologie et de la Communication, University of Luxembourg, Luxembourg, Luxembourg (zhao.li@uni.lu), (2) Federal Agency for Cartography and Geodesy, Frankfurt am Main, Germany, (3) Helmholtz Centre Potsdam, GFZ German Research Centre For Geosciences, Potsdam, Germany, (4) Astronomical Institute, University of Bern, Bern, Switzerland, (5) IGN LAREG, Univ Paris Diderot, Sorbonne Paris Cite, Paris, France

Observations indicate that global warming is affecting the water cycle. Here in Europe predictions are for more frequent high precipitation events, wetter winters, and longer and dryer summers. The consequences of these changes include the decreasing availability of fresh water resources in some regions as well as flooding and erosion of coastal and low-lying areas in other regions. These weather related effects impose heavy costs on society and the economy. We cannot stop the immediate effects global warming on the water cycle. But there may be measures that we can take to mitigate the costs to society.

The Horizon2020 supported project, European Gravity Service for Improved Emergency Management (EGSIEM), will add value to EO observations of variations in the Earth's gravity field. In particular, the EGSIEM project will interpret the observations of gravity field changes in terms of changes in continental water storage. The project team will develop tools to alert the public water storage conditions could indicate the onset of regional flooding or drought.

As part of the EGSIEM project, a combined GRACE gravity product is generated, using various monthly GRACE solutions from associated processing centers (ACs). Since each AC follows a set of common processing standards but applies its own independent analysis method, the quality, robustness, and reliability of the monthly combined gravity fields should be significantly improved as compared to any individual solution. In this study, we present detailed and updated comparisons of the combined EGSIEM GRACE gravity product with GPS position time series, hydrological models, and existing GRACE gravity fields. The GPS residuals are latest $REPRO_2$ station position residuals, obtained by rigorously stacking the IGS Repro 2 , daily solutions, estimating, and then restoring the annual and semi-annual signals.