

GGFC Workshop Vienna, 20 April 2012



The International Earth Rotation and Reference Systems Service's (IERS) Global Geophysical Fluid Center (GGFC) provides the geodetic community with data and models of geodetic effects (rotation, gravity and deformation) driven by the temporal redistribution of the Earth's fluids, as well as information needed for geodetic observations that are reliant on the state of its fluids.

The GGFC is composed of four operational entities: the Special Bureau for the Atmosphere, the Special Bureau for the Oceans, the Special Bureau for Hydrology and the Special Bureau for the Combination Products. In addition to the products provided by the Special Bureaus, valuable products generated by the community are also made available through the GGFC. There are currently three GGFC Operational Product Centers that also

contribute to the GGFC store of data.

The GGFC recently organised a workshop to allow the Special Bureau Chairs, the GGFC Product Centers, and the GGFC user community to assess the errors in current environmental models, and to solicit ideas for overcoming these limitations so that the data could be reliably used in geodetic and geophysical data analyses. Thirty scientists from the geodetic community attended the workshop with an agenda of 20 presentations, which included a review of the newly proposed GGFC Provisional Products, comparing models with geodetic observations, geodetic observations driven by fluid redistribution, and examining current issues and future challenges for the GGFC and the geodetic community. The workshop programme and the presentations are available at website 1.

The workshop concluded with the following recommendations:

1. A special bureau should investigate forming intra-fluid weighted combined products of available models and forecasts and investigate ways to quantify relative errors.
2. The GGFC should promote dynamic barometer models and products, especially for short-period applications.
3. Sub-daily product sampling for all surface fluids should become more widely available.
4. A special bureau should promote adoption of common product formats and delivery modes, e.g. for load grids.
5. Efforts should be made to reduce the latency of the products required for operational use (especially when oceanic forcing is used), e.g. by providing suitably accurate forecast products.
6. The GGFC angular momentum components should lead a review and recommend procedures and algorithms for computing EOP excitations from geodetic time series.
7. Apparent large discrepancies in surface hydrology EOP excitations should be investigated in view of the relatively better performance of such models in computing local surface load displacements than for global angular momentum variations.
8. Working with the Technique Services and the wider geodetic community, the utility of load corrections in geodetic data reductions needs to be much better quantified and put on a sound statistical basis.
9. Global mass conservation is one of the biggest issues facing the community. Summing different models (atmosphere+ocean+water storage) leads to inconsistencies. Only models (e.g. ocean and hydrology) that are forced by the same atmospheric model should be combined to compute total effects.
10. A much better understanding of internal measurement errors by all the space geodetic techniques is needed if these are to be used to evaluate fluid-based load models.

It is our hope that the GGFC and its user community can make progress on many of these issues in the next few years.