WCRP Task team for the Intercomparison of ReAnalyses (TIRA): Motivation and Progress
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WCRP World Climate Research Programme

Motivation

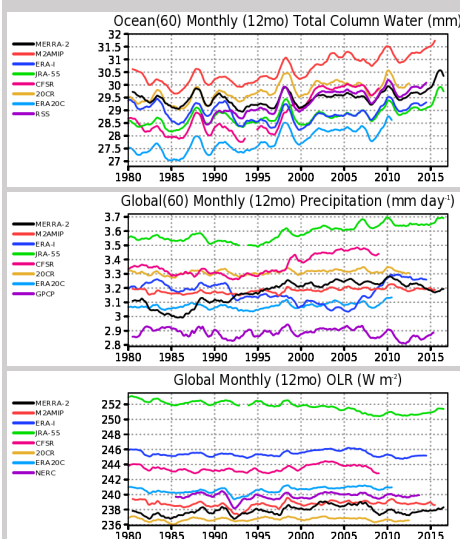The primary charge to TIRA is to develop a reanalysis intercomparison project plan to attain the following objectives.

1. To foster understanding and estimation of uncertainties in reanalysis data by intercomparison and other means
2. To communicate new developments and best practices among the reanalyses producing centers
3. To enhance the understanding of data and assimilation issues and their impact on uncertainties, leading to improved reanalyses for climate assessment
4. To communicate the strengths and weaknesses of reanalyses, their fitness for purpose, and best practices in the use of reanalysis datasets by the scientific community

Significant Departures in Reanalyses

The differences among reanalyses and their inherent uncertainties are some of the most important questions for both users and developers of reanalyses. Therefore, a collaborative effort to systematically assess and intercompare reanalyses would be a logical progression that fills the needs of the community and contributes to the WCRP mission. Several efforts have self started to address these issues (S-RIP and ORA-IP)

While much the same sets of observations are available to all current reanalysis systems (though some methodologies call for limited observing systems), variations can occur in the actual usage of data due to the assimilation method, the way observations are selected, handled and quality controlled, and biases in various properties of the assimilating model.

Potential Development of Common Experiments

- **Concept:** Common issues can be present in multiple reanalyses, need internal knowledge to understand each
- **Action:** Determine which centers can participate. Develop an experimental plan including case studies and/or additional diagnostic output and metrics
- **Cost:** Developing centers incur computing and personnel time to evaluate the experiments
- **Benefit:** Should provide more understanding of the reanalysis method than could be accomplished alone

Current Membership

- Magdelena Balmaseda (ECMWF/CLIVAR)
- Michael Bosilovich (NASA/GMAO/USA Co-Chair*)
- Gil Compo (CIRES/WRIT/USA)
- Chris Derksen (ECCC/CliC/Canada)
- Masatomo Fujiwara (JMA/SPARC/Japan/S-RIP)
- Hans Hersbach (ECMWF)
- Shinya Kobayashi (JMA)
- Wesely Ebisuzaki (NOAA/EMC/USA)
- Andreas Storto (CMCC/ORA-IP)
- Chenghu Sun (CMA/NMIC)
- Gerald Potter (NASA/CREATE/USA)
- Otis Brown (NCSU/USA/WDAC)
- Matthias Tuma (WCRP)

Developing Tools and Communities

Performing intercomparisons requires easily accessible data. WRIT and CREATE projects are developing utilities to help users. (Above)

The SPARC community needed some understanding of the differences among reanalyses, and so, took on a reanalysis intercomparison project. SRIP provides an initial template and ideas for organizing reanalyses intercomparison. In particular, key aspects of the project have assigned names working on specific topics. In addition, CORE CLIMAX (under Copernicus climate services) has developed a technical volume on various levels of quantitative complexity of reanalysis intercomparison.

Developing a Reanalysis Intercomparison Project

- More of a coordinating body, than an actual project
- Should have membership that includes the disciplinary projects as well as developing centers
- Maintain and promote best practices and promotes communication of results
- Development of metrics
- Formulating common experiments is possible
- Still needs discussion/input/suggestions

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