

Data Assimilation Task Team (DA-TT) update

Andy Moore and Matt Martin

Status and plans for DA-TT

- Exchanging information between the DA-TT members, OSEVal-TT and the wider ocean DA community through a virtual [technical seminar series](#).
 - Recent seminars:
 - 5 Sep 2022, Andrea Storto (CNR): “The use of neural networks for coupled ocean-acoustic DA”
 - 1 Dec 2022, Marcin Chrust (ECMWF): “Overview of Ocean DA developments at ECMWF”
 - Next one TBA.
- Supporting EGU session “Data assimilation techniques and applications in coastal and open seas” with an associated [special issue](#) in the journal Ocean Science.
- Participating in a European activity as part of the Mercator Ocean International DA expert team to discuss possibilities for agreeing a common DA software infrastructure by some European operational ocean forecasting groups (chaired by Mike Bell and Pierre de Mey).
- Participated in organization of EuroSeas workshop.
- Ongoing engagement with WMO WWRP DAOS-WG (coupled model initialization initiative with WGNE, OMDP, S2S, TPOS2020 communities).
- Engaged in WMO workshop on impact of observing systems via DAOS-WG.
- Discussing transition options for new TT co-chairs.
- Organising an upcoming DA-TT workshop – see next slide.

DA-TT workshop to be held at CNR in Rome, 9-11 May 2023

The meeting aims to bring together experts in the field of ocean and coupled DA to discuss the latest progress and challenges in the field, and to share experiences in the development of ocean/coupled DA from the underlying algorithms to the details of implementation in operational forecasting systems.

Overarching topics of discussion will include:

- How to improve **integration of ocean DA developments in operational forecasts** and **demonstrate the impacts** on ocean and coupled forecasts.
- How to contribute to **the UN Decade for Ocean Science**. Examples include the role of DA in digital twins, ocean best practices, and the evaluation and design of ocean observing systems. Should the DA-TT organise its own contribution to the UN Decade?
- How to **link better with the WMO community and other external groups**. Examples include the input of ocean observation requirements to WMO, links to the DAOS working group, and links to the ISDA.
- Strengthen ties with (i) the machine learning community for DA applications ; (ii) infrastructure projects such as JEDI and OOPS

Scientific themes:

1. Advances in DA methods (ensembles, algorithms, machine learning, downscaling, ...)
2. Error covariance modelling (B, Q and R, hybrid approaches)
3. Observing systems: requirements, evaluation, design and associated DA developments
4. Software infrastructure and efficient use of DA on HPCs
5. Coupled Earth system DA (e.g., ocean/atmosphere/sea-ice, physics/biogeochemistry, physics/acoustics)
6. Applications of DA in operational forecasting, reanalysis systems, digital twins and climate prediction.

Organising committee:

Andy Moore (UCSC), Matt Martin (Met Office), Andrea Storto (CNR), Kirsten Wilmer-Becker (Met Office), Marcin Chrust (ECMWF), Anthony Weaver (CERFACS), Anna Teruzzi (OGS), Sergey Frolov (NOAA), Ann Kristin Sperrevik (Norwegian Meteorological Institute)

Contributions to UN Decade

- Contributions to SynObs. – several presentations at the recent SynObs Kick-off workshop in Nov.
 - input to OSE/OSSE guidelines
- UN DCC Ocean Forecasting Co-Design Team (Andy and Matt both members).
- Will discuss possible additional contributions to the Decade in our DA-TT meeting in May.

DA-TT issues/questions

- Technical seminar series:
 - Interesting presentations and useful to keep the dialogue going between workshops.
 - Include more/all of the other TTs
- Expand TT membership to include machine learning experts.
- As always DA-TT will continue to interact and collaborate with other TTs – how best to do that.
- UN Decade:
 - Still uncertain how DA-TT can contribute beyond to projects beyond what we're currently doing.
 - We will discuss potential project ideas at the next DA-TT workshop in May.
- UN Decade - Intellectual capacity building:
 - Training of the next generation of ocean “data assimilators” and forecasters promoted by DCC-OP
 - Decade-sponsored workshops, summer schools, hands-on technical training leveraging on existing experience.
 - Perhaps promote a “class” based on the ETOOFS Guide. This could be a set of pre-recorded modules online made available to the broader community.