The GOV COSS Task Team: News + Focus activities

Pierre De Mey, LEGOS/U. Toulouse
Villy Kourafalou, RSMAS/U. Miami
TT members and COSS community
<table>
<thead>
<tr>
<th>Name</th>
<th>Institution, City</th>
<th>Country</th>
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<tbody>
<tr>
<td>Barth, Alexander</td>
<td>U. Liège</td>
<td>Belgium</td>
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<td>Bricheno, Lucy</td>
<td>NOC Liverpool</td>
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<tr>
<td>Chao, Yi</td>
<td>RSS and UCLA, Los Angeles, CA</td>
<td>USA</td>
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<td>(Not nominated)</td>
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<td>Choi, Byoung-Ju</td>
<td>Kunsan National U.</td>
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<td>Cirano, Mauro</td>
<td>REMO, Rio de Janeiro</td>
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<td>Charria, Guillaume</td>
<td>IFREMER / Previmer, Brest</td>
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<td>De Mey, Pierre</td>
<td>CNRS / LEGOS, Toulouse</td>
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<td>Dufau, Claire</td>
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<td>Edwards, Chris</td>
<td>UCSC, Santa Cruz</td>
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<td>He, Ruoying</td>
<td>NCSU, Raleigh, NC</td>
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<td>Herzfeld, Mike</td>
<td>CSIRO, Hobart</td>
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<td>Hirose, Naoki</td>
<td>Kyushu U., Fukuoka</td>
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<td>Hole, Lars</td>
<td>met.no</td>
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<td>Gan, Jianping</td>
<td>Hong Kong U. of S&amp;T</td>
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<td>Kamachi, Masafumi</td>
<td>JMA/MRI</td>
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<td>Kourafalou, Villy</td>
<td>U. Miami / RSMAS, Miami, FL</td>
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<td>Kurapov, Alexander</td>
<td>Oregon State U. / COAS, Corvallis, OR</td>
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<td>Levier, Bruno</td>
<td>Mercator Ocean</td>
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<td>Liu, Guimei</td>
<td>NMEFC, Beijing</td>
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<td>O’Dea, Enda</td>
<td>UK Met Office, Exeter</td>
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<td>Pinardi, Nadia</td>
<td>U. Bologna</td>
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<td>Pullen, Julie</td>
<td>Stevens Institute of technology</td>
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<td>Richman, Jim</td>
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<td>Stanev, Emil</td>
<td>HZG, Hamburg</td>
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<td>Van der Westhuysen, André</td>
<td>NOAA/NWS/NCEP</td>
<td>China</td>
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<td>Zhu, Jiang</td>
<td>IAP, Beijing</td>
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**TT members**

- COSS-TT is engaging the international Coastal Ocean and Shelf Seas modeling/forecasting community (COSS-COMM)
- International Coordination Workshops are open to the COSS-COMM
- > 100 people in COSS-COMM mailing list at the moment
Membership changes following Lisbon workshop

- **New members (6)**
  - Masa Kamachi, MRI, Japan [also a COSS-TT champion]
  - Chris Edwards, UCSC [also a MEAP-TT member]
  - Bruno Levier, Mercator Ocean, France
  - Claire Dufau, CLS, France – link w/ ARCOM, CAW
  - Lucy Bricheno, NOC, UK
  - Lars Hole, met.no, Norway

- **Replacements (2)**
  - DFO, Canada: Joël Chassé → ?
  - IFREMER, France: Franck Dumas replaced by Guillaume Charria

- **Being discussed (1)**
  - Nguyen Ba Thuy, NHMS, Vietnam
Goals and achievements so far
The Task Team...

...is one of the GODAE OceanView task teams

...fosters international collaboration to advance science and applications in support of coastal ocean forecasting

...focuses on coastal and shelf dynamics, open ocean processes that control shelf break exchanges, as well as land-sea interactions through estuaries and inlets

...aims to help achieve a seamless transition framework from the global to the coastal scales.
Two types of systems with regional/coastal relevance within GOV:

- **COFS** – Coastal Ocean Forecasting Systems (represented in COSS-TT, and in GOVST via TT co-chairs)
  
- **LOFS** – Large-scale Ocean Forecasting Systems (represented in GOVST, not always represented in COSS-TT)
Three workshops helped define priority areas where science is needed for the development of Coastal Ocean Forecasting Systems:

1. **Monitoring** of physical and biogeochemical parameters in coastal regions (in particular permanent/long-term)

2. Development of fine-scale coastal ocean **models**

3. **Integration**: Downscaling the ocean estimation problem from large-scale to coastal-scale models, data and forcings, coastal data assimilation and prediction, consistent validation metrics

4. Coastal-scale atmosphere-waves-ocean **couplings**

5. **Ecosystem response** to the physical drivers

6. **Probabilistic approaches** and risk assessment in the coastal ocean, including extreme events
A few activities and achievements so far

- The Task Team acts as a link between the international Coastal Ocean Forecasting community and GODAE OceanView.

- A Coastal Systems Information Table is available (update pending).

- Coastal Ocean Forecasting: system integration and validation.

- Coastal Ocean Forecasting: science foundation and user benefits.

- Two synthetic COSS Community papers from the 2013 Symposium have been published.

- A COSS Topical Collection of papers (~14) is being finalized in Oc. Dynamics.

- Links are being developed with the IV-TT and with other active international communities, such as the Coastal Altimetry community and EuroGOOS.

- The next such session will be in New Orleans in early 2016.
Focus Activities
Main points regarding TT:

- **Overall very positive evaluation**

- **Findings:** “The core emphasis of GOV is the global ocean. However, it is clear that many of the key uses for forecast models are in coastal and shelf seas. Having a Task Team focussed on connecting GOV to research communities working in coastal and shelf seas modelling and to applications of operational coastal model systems is therefore essential.”

- “Consistent with the GOV strategic plan, the challenges in this Task Team’s science strategy document need to be prioritized by the ‘value add’ of collective action.”

- “Focus should be on the interfaces between GOV systems and coastal models and applications.”
As agreed at GOVST5 (Beijing):

- “FA1: Discuss science to enable/support the development of COFS and applications
- FA2: Work towards better integration between COFS and LOFS via downscaling (models & data), and in particular illustrate the added value of downscaling via consistent metrics
- FA3: Link with the active regional/coastal altimetry community and discuss how altimetry can improve the forecast quality and enable new applications in the regional/coastal oceans”
As agreed at GOVST5 (Beijing):

- **FA1:** Discuss science to enable/support the development of COFS and applications

- **FA2:** Work towards better integration between COFS and LOFS via downscaling (models & data), and in particular illustrate the added value of downscaling via consistent metrics

- **FA3:** Link with the active *regional/coastal altimetry community* and discuss how altimetry can improve the forecast quality and enable new applications in the regional/coastal oceans”
I. Discuss the interest of sea level measurements for the regional/coastal ocean modellers and COFS

II. Present the available altimetry missions and products to the coastal forecasting community; discuss recent advances and projects

III. Discuss how altimetry can improve the forecast quality and enable new applications in the regional/coastal oceans

IV. Discuss how to use altimetry products in R/COFS for assimilation and validation

V. Establish a community of practice to advance complementary uses of coastal altimetry in regional/coastal modelling and prediction, involving the COSS community and the regional altimetry groups

→ John Wilkin’s presentation
COSS-TT Focus Activities

As agreed at GOVST5 (Beijing):

• “FA1: Discuss science to enable/support the development of COFS and applications

• FA2: Work towards better integration between COFS and LOFS via downscaling (models & data), and in particular illustrate the added value of downscaling via consistent metrics

• FA3: Link with the active regional/coastal altimetry community and discuss how altimetry can improve the forecast quality and enable new applications in the regional/coastal oceans”
### Session 3: Data and metrics to assess the added value of downscaling

<table>
<thead>
<tr>
<th>Introduction to Session 3</th>
<th>Pierre De Mey and Villy Kourafalou</th>
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<tr>
<td>Overview of recent progresses of validation and inter comparison GOV activity of global forecasting systems</td>
<td>Fabrice Hernandez (IV-TT, Mercator Ocean, France)</td>
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<tr>
<td>GODAE OceanView Class 4 intercomparison</td>
<td>Andy Ryan (Met Office, UK)</td>
</tr>
<tr>
<td>New assessment of MyOcean forecasting systems in European Seas using process oriented metrics</td>
<td>Jan Maksymczuk (Met Office, UK)</td>
</tr>
<tr>
<td>Evaluation of Ocean Syntheses COST-EOS action: a European network to inform the quality of Ocean Syntheses for applications, downscaling and model nesting</td>
<td>Marie Drévillon (COST-EOS, Mercator Ocean, France)</td>
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<tr>
<td>IBIRYS: a Regional High Resolution Reanalysis (physical and biogeochemical) over the European North East Shelf</td>
<td>Bruno Levier (Mercator Ocean, France)</td>
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**Discussion: Practical steps to be taken jointly by COSS-TT, IV-TT and COST-EOS WG4 for the assessment of the added value of regional/coastal downscaling**

| Observing System Simulation Experiments in the North Atlantic Ocean hurricane region: system evaluation and regional applications | Villy Kourafalou (U. Miami, USA) |
| UK Environmental Prediction – coupled coastal modelling at high resolution               | Lucy Bricheno (NOCL, UK)        |
| Upgrade of the operational Global Real Time Ocean Forecast System: Global and Regional Metrics | Avichal Mehra (NOAA, USA)       |

**Discussion: Specific Science Topics to be targeted**
Summary

- Use of Metrics works well for evaluating upgrades
- All classes of metrics provide for a diverse evaluation which otherwise can be limited because of paucity of observations
- Regional metrics provide useful information on differences which Global metrics may not capture
- Appropriate regional metrics need to be defined for specific regions/coastal interests (transports, fronts etc.)
- Regional metrics will require higher frequency and resolution of measurements
- Engagement with regional stakeholders/users/applications

Conclusion of Avichal Mehra’s presentation in Lisbon
General workplan for COSS-FA2 proposed by the COSS-TT and IV-TT in Lisbon:

- **Action A**: Voluntary groups compare large-scale and downscaled regional/coastal systems with the same metrics.

- **Action B**: Launch coastal Pilot Projects with a focus on downscaling and quality metrics.
Focus Area 2 – Action A

- Aim: voluntary groups compare large-scale and downscaled regional/coastal systems with the same metrics
  - Best effort mode: use own metrics, use own resources
  - Aim is pragmatic: illustrate, provoke discussion at COSS-ICW5, consider common or separate publication in Topical Collection/Special Issue
UK Environmental Prediction

Lucy Bricheno, NOC Liverpool
Juan Manuel Castillo Sanchez & Huw Lewis, Met Office
2. A new km-scale coastal ocean model

OPERATIONAL – 7 km

NEXT-GENERATION – 1.5 km

[Ashley Brerton, Karen Guihou, Enda O’Dea]
Surface drifter experiments and oil drift modelling in coastal regions

Lars R. Hole, Knut F. Dagestad, Erna Joensen
Johannes Röhrs, Cecilie Wettre

17.11.2015
Ocean modelling: Arctic20 + Nordic4 + NorKyst800
Comparison of Isphere trajectories and oil drift model simulations

Isphere 9
30 min average speed

Drifter
Nordic4 2hr surface
Norkyst800 1 hr surface
IBIRYS reanalysis 2002-2011

B. LEVIER¹, M. Benkiran², G. Reffray¹, M. Garcia Sottilo³

1) MERCATOR OCEAN  2) CLS  3) PUERTOS DEL ESTADO

GODAE COSS-TT Lisbon 2015
Consistent trend for IBI and GLO at large scale.

SST trend

SSS trend
Bay of Biscay seasonal currents

Seasonal averages of depth-averaged currents at ADCP locations

GLORYS

IBIRYS

Le-Boyer et al. (2013)
Focus Area 2 – Action A

- **Aim:** voluntary groups compare large-scale and downscaled regional/coastal systems with the same metrics
  - Best effort mode: *use own metrics, use own resources*
  - Aim is pragmatic: illustrate, provoke discussion at COSS-ICW5, consider common or separate publication in Topical Collection/Special Issue

- **Participants**
  - First volunteers identified at ICW4 *(GOVST COSS-TT BOTH):* CMCC, MERCATOR Ocean, CSIRO, REMO, MRI?, UCSC, U. Thessaloniki, SOCIB, Puertos del Estado, IEO
  - Action provides opportunity for GOVST groups to show concern for own national stakeholders’ interests – at little cost!

- **Calendar and opportunities**
  - **Dec 2015:** IV-TT and COSS-TT co-chairs to contact GOV and COSS groups with rules: submit abstract; report at ICW5; interest for publication yes/no
  - Possible participation in IV-TT workshop – 1\textsuperscript{st} semester 2016
  - **During 2016:** COSS/IV-TT co-chairs to communicate with groups on publication
  - **March 2017:** Report at ICW5.
Focus Area 2 – Action B

Aim: Launch coastal Pilot Projects with a focus on downscaling and quality assessment – 2 steps:

1. **A cross-TT Working Group prepares a (publishable) White Paper**
   - COSS-TT + IV-TT members + optionally experts, DA-TT, MEAP-TT
   - Science and components of Pilot Projects towards regional/coastal downscaling and forecasting and quality assessment

2. **Launch (multi-year) projects [or enlist existing projects]**
   - Funding opportunities: CMEMS (User uptake and Service evolution calls), System-specific funding sources, GOV Patrons, ?
   - Report on project advancement at COSS-TT workshops; inter-project/inter-regional discussions at workshops

Calendar

- **Jan 2016**: IV-TT and COSS-TT co-chairs contact members of both Task Teams with working document to form WG *(GOVST groups very welcome!)*
- Contact external experts
- **June 2016**: First draft of WP [possibly optimistic...]
- **2016/2017**: build/submit proposals, discuss at ICW5, publish part of WP
1. **Objectives of WP**

2. **Coastal ocean modelling and forecasting in GOV**
   - Coastal ocean modelling in the GODAE OceanView Strategic Plan
   - Outline/common characteristics/own objectives/rough classification of COSS-TT systems [use SIT in Appendix]

3. **Science challenges related to regional/coastal downscaling and forecasting and quality assessment**
   - Written in publishable format (authors list=WG)
   - First keywords (as cited at ICW4): validation, downscaling, metrics, forecasting, river to ocean continuum [also cited: tides and dissipation, qc, reference datasets]... TBD

4. **Proposed approach**
   - Components of Pilot Projects

5. **Appendix: COSS System Information Table**
COSS White Paper – Relevant material

- **GODAE/CSSWG material**

- **GOV/COSS-TT material**
  - *COSS-TT Systems Information Table* – K. Wilmer-Becker and M. Cirano

- **GOV/IV-TT material**

- **GOV 2013 Symposium papers**

- **IV-TT and COSS-TT presentation material**
Quad chart describing the progress of annual activity in the GOV TTs

Name of TT: COSS-TT

Date: 29/07/2015

<table>
<thead>
<tr>
<th>Short description and objectives of the activities started/planned for this year:</th>
<th>Accomplishments of the TT this year:</th>
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<tbody>
<tr>
<td>• FA1: Continue general TT work on targeted science to enable/support the development of COFS and applications and meet priority challenges</td>
<td>• FA1: Organization of the GOV/COSS-TT International Collaboration Workshop 4 (ICW-4) in Lisbon (08/31-09/04)</td>
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<tr>
<td>• FA2: Work towards better integration between COFS and LOFS via downscaling, illustrate added value via consistent metrics</td>
<td>• FA2: Organization of a special session at ICW4 jointly with IV-TT and EU EOS project – homework to be decided upon in Lisbon</td>
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<td>• FA3: Link with the active regional/coastal altimetry community and accompany the jumps in resolution and in “information forcing” towards extending prediction capabilities of COFS</td>
<td>• FA3: Organization of a pilot ARCOM workshop embedded in ICW4 (ARCOM = Altimetry for Regional and Coastal Ocean Models)</td>
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<td>• Publication of two community papers in JOO following the 2013 GOV Symposium</td>
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<td>• Ongoing COSS Topical Collection in Ocean Dynamics (currently 12 papers)</td>
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Future plans to continue/improve current activities:

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<th>Issues/problems:</th>
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<tr>
<td>• ICW-5 planned in early 2017, themes to be decided in Lisbon</td>
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<tr>
<td>• Homework on COFS metrics and added value of downscaling to be decided in Lisbon jointly with IV-TT and discussed at ICW4</td>
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<td>• ARCOM future format and plans to be decided in Lisbon</td>
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<td>• COSS-TT-sponsored session proposal accepted at OSM 2016</td>
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<td>• Discuss publication/communication plan, in particular new TC</td>
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Issues/problems:

| Financial help by Patron(s) to buy O(100) copies of COSS Topical Collection would be extremely helpful (for whole GOV community). (Minor) amount known when editorial process will be over. |

Additional comments: KEY:--

FA = Focus Area (as agreed upon in Beijing)
COFS = Coastal Ocean Forecasting System
LOFS = Large-scale Ocean Forecasting System