TT meeting agenda (Nov. 5, 10:00-12:00)

- Review of TT and ongoing TT actions in 2012-2013
- Discussion – Possible topics:
  1. TT drivers – what we want to achieve
     - Including GOV Patrons views on drivers and needs
  2. Representing new coastal/regional systems
  3. Opportunities for linking TT with other international actions
     - In particular, linking with regional/coastal modelling communities (“geographically affiliated alliances”)
  4. New TT members
  5. Targeted scientific topics for 2013 workshop:
     - integrated observations, coastal observatories, data assimilation
     - downscaling approaches
     - coastal applications and feedback to TT and GOV
     - Ppl to invite
  6. Targeted scientific topics for 2013 GOV symposium
Activities of the Coastal Ocean and Shelf Seas Task Team

Pierre De Mey, LEGOS/U. Toulouse
Villy Kourafalou, RSMAS/U. Miami

Wed talk (still incomplete)
The coastal ocean and shelf seas: where most of the interactions between human activities and the ocean take place.

Coastal ocean processes have an influence felt far beyond the shelf break, and interact with open ocean dynamics.
Talk outline

- TT objectives and membership
- 2012 activities
- January 2012 workshop and subsequent actions
- February 2013 workshop
General missions and goals of TT

- The Coastal Ocean and Shelf Seas Task Team (COSS-TT) continues the action of the GODAE Coastal and Shelf Seas Working Group (2006-2009).

- The main goal of the TT is to work in coordination with the GOV-ST and GOOS towards the provision of a sound scientific basis for sustainable multidisciplinary downscaling and forecasting activities in the world coastal oceans.

- The strategic goal of the TT is to help achieve a seamless framework from the global to the coastal/littoral scale.

- The TT was created in 2009 but several key activities only started this year. The first international COSS workshop was organized at (in partnership with) U. Miami in Jan 2012, and the second (partner: CMCC) will be held in Italy in Feb 2013.

- The COSS-TT is one of the GOV Task Teams, but COSS is also a community in the building.
What we try to achieve

- The main objective of the TT is more the scientific coordination of coastal ocean forecasting systems (COFS) than a science forum as the previous CSSWG.
  - Try to get the most advanced teams to collaborate with each other.

- TT members: scientists, directly or closely associated with the development of COFS
  - Who can commit (along with their teams) to decisions made together at TT workshops
  - Who can serve as agents of exchange of ideas with a broader community

- In the TT membership, we favor coastal systems with clear objectives and calendar.

- The downstream/applicative aspects are important for us insofar as they open new fields for science.
  - Also it is important to bridge the gap between funded academic research (mainly from government funds) and applications suitable for the industry.
COSS-TT members as of Nov, 2012

<table>
<thead>
<tr>
<th>Name</th>
<th>Institution, City</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barth, Alexander</td>
<td>U. Liège</td>
<td>Belgium</td>
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<tr>
<td>Chao, Yi</td>
<td>UCLA, Los Angeles, CA</td>
<td>USA</td>
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<tr>
<td>Chassé, Joël</td>
<td>DFO, Mont-Joli, QC</td>
<td>Canada</td>
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<td>Cirano, Mauro</td>
<td>REMO, Rio de Janeiro</td>
<td>Brazil</td>
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<td>Craig, Peter</td>
<td>CSIRO, Hobart</td>
<td>Australia</td>
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<tr>
<td>De Mey, Pierre</td>
<td>CNRS / LEGOS, Toulouse</td>
<td>France</td>
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<tr>
<td>Dumas, Franck</td>
<td>IFREMER / Previmer, Brest</td>
<td>France</td>
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<tr>
<td>He, Ruoying</td>
<td>NCSU, Raleigh, NC</td>
<td>USA</td>
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<td>Herzfeld, Mike</td>
<td>CSIRO, Hobart</td>
<td>Australia</td>
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<td>Hirose, Naoki</td>
<td>Kyushu U., Fukuoka</td>
<td>Japan</td>
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<td>Jianping, Gan</td>
<td>Hong Kong U. of S&amp;T</td>
<td>China</td>
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<td>Kourafalou, Villy</td>
<td>U. Miami / RSMAS, Miami, FL</td>
<td>USA</td>
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<td>Kurapov, Alexander</td>
<td>Oregon State U. / COAS, Corvallis, OR</td>
<td>USA</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>Oddo, Paolo</td>
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<td>Patchen, Richard</td>
<td>NOAA / NOS, Silver Spring, MD</td>
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<td>Pinardi, Nadia</td>
<td>U. Bologna</td>
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<td>Richman, Jim</td>
<td>NRL, Stennis Space Ctr., MS</td>
<td>USA</td>
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<td>Staney, Emil</td>
<td>HZG, Hamburg</td>
<td>Germany</td>
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<tr>
<td>Zhu, Jiang</td>
<td>IAP, Shenzhen</td>
<td>China</td>
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</tbody>
</table>

(Membership still evolving)
2012 activities

- Establish community links between ongoing coastal ocean forecasting projects
  → First international coordination workshop in Miami, Jan 10-12, 2012

→ Workshop actions list complements TT workplan

- Convene forums to discuss targeted science issues
  → 4 oral session “slots” + posters at OSM, Salt Lake City, Feb 2012

- Regularly communicate with GOV co-chairs on TT objectives
  → teleconference in June (COSS-TT Co-chairs + GOV co-chairs +, KWB)
“Convene forums to discuss targeted science issues”

- Activity continuous since 2006
- Organised by GODAE CSSWG: (up to Nov 2008)
    - Ocean Dynamics special issue (Vol. 59, Feb 2009)
- Organised by GOV COSS-TT: (starting Dec 2008)
  - AGU Fall Meeting 2008, *San Francisco*, USA, Dec 2008: “Advances in prediction capabilities of interdisciplinary nested models in coastal and shelf seas” (*1 oral session + posters*)
First international coordination workshop (ICW-1)
U. Miami, USA, 10-12 Jan 2012

Mostly scientific coordination:

- Review ongoing (national) coastal ocean forecasting activities
  - People to represent more than their teams: national/regional activities
  - For each system, provide:

<table>
<thead>
<tr>
<th>System</th>
<th>Objectives Calendar Products + Issues</th>
<th>Assessment strategies + Issues</th>
<th>Use of large-scale products + Expectations, Issues</th>
<th>Applications + Issues</th>
</tr>
</thead>
</table>

- Discuss good practices & common strategies – in particular re: model assessment & error estimates, tools (model, nesting, DA)
  - White Paper

- Identify the objectives we have in common; discuss homework and collaboration between projects on that basis
  - Aim at starting pilot projects involving several groups (difficult within 2 years)

- Discuss use of altimetry in coastal ocean systems
  - Short-term step: evaluation of dedicated products: PISTACH, COASTALT, CTOH
  - Perspective of SWOT: HR/HF modelling, complementary in situ observations

- Examine linkages with regional GOOS & PICO
Systems Information Table – Input form

- System/project description
  - ID No, Contact name, System or project name, Institute(s), Country, System/project description, Domain(s)

- Project objectives
  - ID No, Project, Objectives, Project Status, Has a time-line?, Products, Realtime?, Issues

- Assessment strategies
  - ID No, Project, Strategies to assess quality, Data used for assessment, Issues

- Usage of large scale products
  - ID No, Project, Which products do you use?, Downscaling approaches, Issues

- Applications
  - ID No, Project, Applications, PICO POIs, Issues
Systems Information Table (SIT)

- [http://godaetwiki.ab-hosting5.co.uk/bin/view/Main/COSSTTSystemDescriptions](http://godaetwiki.ab-hosting5.co.uk/bin/view/Main/COSSTTSystemDescriptions)
- 31 entries so far
- What can we do with the table?
  - (Regularly updated) Web presence for systems
  - “Views”
    - Geographic
    - Related to objectives (serve communities, customers, ...)
    - Related to (domains of) application(s)
    - Related to methods
    - ?
## PICO Phenomena of Interest (PoIs) in the SIT

<table>
<thead>
<tr>
<th>PoI</th>
<th>Key Indicators of Ecosystem States</th>
<th>Response (SIT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Harmful Algal Blooms</td>
<td>Distribution &amp; abundance of toxic phytoplankton species</td>
<td>11/31</td>
</tr>
<tr>
<td>Coastal Eutrophication &amp; Hypoxia</td>
<td>Phytoplankton biomass fields</td>
<td>7/31</td>
</tr>
<tr>
<td></td>
<td>Dissolved oxygen fields</td>
<td></td>
</tr>
<tr>
<td>Vulnerability to coastal flooding</td>
<td>Extent &amp; condition of habitat buffers to flooding</td>
<td>7/31</td>
</tr>
<tr>
<td>Food Security</td>
<td>Abundance of harvestable finfish &amp; shellfish stocks</td>
<td>5/31</td>
</tr>
<tr>
<td>Ocean acidification</td>
<td>Extent &amp; condition of coral reefs</td>
<td>4/31</td>
</tr>
<tr>
<td></td>
<td>Abundance of calcareous plankton</td>
<td></td>
</tr>
<tr>
<td>Habitat Loss &amp; Modification</td>
<td>Extent &amp; condition of biologically structured habitats</td>
<td>3/31</td>
</tr>
<tr>
<td>Human Exposure to Waterborne Pathogens</td>
<td>Distribution &amp; abundance of waterborne pathogens</td>
<td>1/31</td>
</tr>
</tbody>
</table>
ICW1 agenda (Miami)

1. **Session 1** - Meeting objectives & background
2. **Session 2** - Ongoing coastal ocean forecasting activities in systems
3. **Session 3** - Methods for assessment and assimilation in coastal ocean forecast systems
4. **Session 4** - Data for forcing, assessment and assimilation in coastal ocean forecast systems and applications
5. **Session 5** - Setting a framework to discuss and decide good practices & common strategies (summaries from parallel sessions)
6. Workshop outcomes and future activities

+ **TT meeting**
ICW1 outcomes

- To be done
- Extract main statements from Miami Workshop Report
<table>
<thead>
<tr>
<th>No</th>
<th>Owner</th>
<th>Action</th>
<th>Progress/comments</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>Co-chairs</td>
<td>Stabilize TT membership</td>
<td>Identify Ifremer member (Done, Franck Dumas, with Guillaume Charria as backup)</td>
</tr>
<tr>
<td></td>
<td>PDM</td>
<td>Identify NMEFC member (Done, Liu Guimei, with Wang Dakui as backup)</td>
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<td></td>
<td>PDM</td>
<td>Identify CSIRO member (Done, Mike Herzfeld)</td>
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<td></td>
<td>PDM</td>
<td>Identify DFO member (Done, Joël Chassé, with Denis Lefaivre as backup)</td>
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<td></td>
<td>PDM</td>
<td>Identify S. Korean contact (Done, Prof. Byoung-Ju Choi, Kunsan U.)</td>
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<tr>
<td>2</td>
<td>KWB</td>
<td>Make talks available on the web site</td>
<td>Done</td>
</tr>
<tr>
<td>3</td>
<td>VK, CMCC</td>
<td>Discuss with potential hosts of next workshop &amp; make decision</td>
<td>Done</td>
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<tr>
<td>4</td>
<td>VK</td>
<td>Linkages with MEP-TT</td>
<td>Not started</td>
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<tr>
<td>5</td>
<td>KWB</td>
<td>Set up e-mail list for TT and COMM</td>
<td>Done</td>
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<tr>
<td>6</td>
<td>Co-chairs, TT, KWB</td>
<td>Draft meeting report &amp; work plan update with actions list</td>
<td>Done</td>
</tr>
<tr>
<td></td>
<td>PDM</td>
<td>Draft work plan update</td>
<td>Done</td>
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<tr>
<td>7</td>
<td>Co-chairs, TT, KWB</td>
<td>Establish System Information Table</td>
<td>Permanent</td>
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<tr>
<td></td>
<td>Co-chairs, KWB</td>
<td>Draft and mail template, including PICO POIs</td>
<td>Permanent</td>
</tr>
<tr>
<td></td>
<td>TT and community</td>
<td>Fill up template</td>
<td>Permanent</td>
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<tr>
<td></td>
<td>Co-chairs, KWB</td>
<td>Draft table on twiki</td>
<td>Permanent</td>
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<tr>
<td>8</td>
<td>Co-chairs, TT, KWB</td>
<td>COSS-TT web site architecture</td>
<td>Not started</td>
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<td>Co-chairs, TT, KWB</td>
<td>Include updatable census of useful links for web page (COMM, permanent): bathymetry, atm forcings, tools, etc.</td>
<td>Not started</td>
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<td></td>
<td>Co-chairs, TT, KWB</td>
<td>Include Job opportunities and other news (COMM, permanent)</td>
<td>Not started</td>
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<tr>
<td>9</td>
<td>Co-chairs, list unclear</td>
<td>Discussions with coastal altimetry community on possible common actions</td>
<td>Yes (CAW2012)</td>
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<tr>
<td>10</td>
<td>Co-chairs, panel members</td>
<td>Launch sub-TT panel on TT organization</td>
<td>Ongoing</td>
</tr>
<tr>
<td></td>
<td>Co-chairs, N. Pinardi</td>
<td>Identify panel members</td>
<td>Done</td>
</tr>
<tr>
<td>11</td>
<td>Co-chairs</td>
<td>Launch drafting of White Paper</td>
<td>Not started</td>
</tr>
<tr>
<td></td>
<td>Co-chairs</td>
<td>Establish focus: science or organization?</td>
<td>Not started</td>
</tr>
<tr>
<td>12</td>
<td>Co-chairs, local organizers, TT, KWB</td>
<td>Draft &amp; organize next workshop</td>
<td>Ongoing</td>
</tr>
</tbody>
</table>
**Affiliated regional groups**

- Not every regional/coastal model can be directly represented in TT
- Follow Regional Alliances strategy
  - John Siddorn’s email
- EuroGOOS C&SS modeling group (Paolo Oddo)
CA and COSS synergy

- COSS-TT co-chair (VK) invited to present COSS activities at CAW’2012 (La Garda, Italy)

- Challenges to address
  - Evaluate the CA contribution to COSS hindcasts and forecasts
    - short-term: compare the physical content of models and observations (need complementary data)
    - long-term: assimilate the data and quantify their impact on model simulations
  - Data assimilation in coastal models →
Existing issues with Data Assimilation in COSS areas

- Coastal and Shelf Seas: superposition of multiple scales
  - adapt the DA strategy: observation data treatment and covariance scales (Yi Chao, 5th CAW)
  - use multivariate DA to constrain the model (A. Kurapov; 5th CAW)

- Coastal and Shelf Seas: assimilate SLA in the presence of tides (large signal on shelf areas; largest tidal model errors)
  - 1st idea: remove tidal signal from the model before assimilating de-tided SLA (Xie et al., 2011)
    - How can we optimize such filtering? Do we lose some information?
    - Can we use that information directly? (the tidal signal is included in the altimetric data)
  - 2nd idea: correct the tidal boundary forcing (Barth et al., 2011, HF radar)
    - Do we need to correct bathymetry? (Mourre et al., 2006)

- Coastal and Shelf Seas: assimilate CA products in coupled circulation-waves models
  - address the consistency between altimetry estimates of roughness and model estimates of waves, wave action and vertical turbulence.
Potential for feedback from COSS to CA

- Relevant data developments
  - Mean sea surface (several datasets)
  - Dynamic atmospheric correction (DAC):
    - signal due to wind and pressure removed with barotropic model (Carrère and Lyard, 2003)
    - global model real-time products (delayed-time?; regional real time model developments?)
  - Tidal correction:
    - global tidal model in many zones; nested high-resolution DA regional model (G. Egbert, 5th CAW)
    - along-track harmonic analysis
- Model contributions needed
  - CA corrections/upgrades must be evaluated
  - COSS systems offer an excellent testbed!
  - Best way forward: common planning

Configuration of in-situ moorings array under a Jason track. (Beal et al., 2009)
ICW2, Lecce, Italy, Feb 4-7, 2013 – Agenda priorities

- Further improve Miami format
- (1) Review ongoing coastal ocean forecasting projects in the world coastal oceans, with a particular focus on system updates, progress and challenges since the Miami workshop
- (2) Discuss background scientific advances in three particular areas:
  - (2A) Integrated coastal observations and data assimilation
  - (2B) Downscaling to coastal regions
  - (2C) Coastal applications
- (3) Enhance international collaboration and formalize COSS sustainability
- (4) Review the list of actions decided in Miami and the status of the Systems Information Table, and decide new actions

- Attendance option: “open by invitation”
- Abstract submissions deadline: Friday, 16 November 2012
- Acceptance notification to authors: Wednesday, 12 December 2012
Thank you!

pierre.de-mey@legos.obs-mip.fr
vkourafalou@rsmas.miami.edu
Coastal Altimetry: recent developments important for COSS systems

Improving 2D maps: examples (1)

- by using tide gauges along the coast (Saraceno et al., 2008, Wang et al., 2011)

Example of interpolation of (left) AVISO SLA and currents based on the use of tide gauges data (middle). From Saraceno et al., 2008.

Improved along-shore currents
Coastal Altimetry: recent developments important for COSS

- Improving 2D maps: examples (2)

- by using shorter correlation scales,
in combination with multi-mission dataset

Example of optimal interpolation of HF along-track data to access mesoscale dynamics. (Dussurget et al., 2011);

> 3 or more altimeters required
Coastal Altimetry: recent developments important for COSS systems

- Improving along-track data: examples (2)

  - Bay of Biscay (NE Atlantic): characterization of the Navidad Current (North of Spain)

  - India: study of the East India Coastal Current (EICC)

  - West Florida Shelf: performance assessment over a wide shelf

Signature of the Navidad Current in along-track geostrophic current anomaly and SST. (Le Hénaff et al., 2011).

Structure of the EICC. (Adapted from Durand et al., 2009).

HF radar radial velocity with satellite tracks (Liu et al., 2011).
Coastal Altimetry: recent developments important for COSS systems

- improving along-track data: examples (3)

  • waveform analysis (PISTACH, COASTALT)
  
  • wet tropospheric correction (PISTACH, COASTALT):
    - better account for land in the altimeter footprint (*Desportes et al., 2007*)
    - combine altimeter radiometer measurements, local measurements and improved atmospheric models (*GPD product, Fernandes et al., 2010*)

![Diagram showing Zenith wet delay (ZWD, m) from the GPD method (black), the inboard radiometer (red) and ECMWF model (blue). Green area are polar/coastal zones. (Adapted from Fernandes et al., 2011).](image-url)