OceanGliders program and (meta)data management
Outline

The OceanGliders program
A component of the integrated GOOS

OceanGliders - BOON
Bringing Sustainable observation to the ocean boundary regions

The role of JCOMMOPS
Technical support to the ocean observations program’s development

Metadata : The key toward an integrated system
OG1.0 : a global glider format
The OceanGliders program
A component of the integrated GOOS

Glider tracks until December 2009

Glider tracks until October 2018
The OceanGliders program
A component of the integrated GOOS

JCOMM Observation Coordination Group (OCG) adopted OceanGliders as an ‘emerging’ network in 2016
The OceanGliders program
A component of the integrated GOOS

JCOMM Observation Coordination Group (OCG) adopted OceanGliders as an 'emerging' network in 2016

OceanGliders “strategy” - 2018

- recommend the development of a global operational program to undertake key ocean observing challenges addressing societal needs.
- recommend that the global glider program first consider three key areas of ocean observation: Ocean Boundary Currents, Storms, and Water Transformation. We recommend that OceanGliders lead an assessment by the ocean observation community on how best to address these three areas of societal need for ocean data.
- recommend the development of a global data management system to ensure the effective sharing and use of ocean data from underwater gliders.
- recommend that OceanGliders develop an implementation plan for a sustained Boundary Ocean Observing Network to meet the societal needs of improving ocean observing in this key region of the global ocean.
The OceanGliders program
A component of the integrated GOOS

- **Boundary Current**: Sustained glider observations in the ocean boundaries
- **Storms**: Increase extreme weather forecast with unique ocean observations
- **Water Transformation**: Monitor shelf/open sea water formations & (sub)mesoscale variability
- **Ocean Health & Ecosystems**: Observe variability, change and environmental stress in marine habitats
- **Data Management**: Harmonize globally and support implementation
- **Best Practices**: Support operations efficiency, harmonization and capacity development
The OceanGliders program
A component of the integrated GOOS

www.oceangliders.org
**OceanGliders**

a component of the integrated GOOS


<table>
<thead>
<tr>
<th>1</th>
<th>CNRS/LOCEAN, France</th>
<th>91</th>
<th>University of Tübingen, Germany</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>MUN, Canada,</td>
<td>14</td>
<td>TAU, South Africa</td>
</tr>
<tr>
<td>3</td>
<td>SIO, USA</td>
<td>15</td>
<td>University of the Hawaiian System, USA</td>
</tr>
<tr>
<td>4</td>
<td>Rutgers Univ., USA</td>
<td>16</td>
<td>UBC, Canada</td>
</tr>
<tr>
<td>5</td>
<td>OC-UCY, Cyprus</td>
<td>17</td>
<td>University of California, USA</td>
</tr>
<tr>
<td>6</td>
<td>Univ. Washington, USA</td>
<td>18</td>
<td>University of the West Indies, USA</td>
</tr>
<tr>
<td>7</td>
<td>UWA, Australia</td>
<td>19</td>
<td>University of the West Indies, USA</td>
</tr>
<tr>
<td>8</td>
<td>WMO, Switzerland</td>
<td>20</td>
<td>UBC, Canada</td>
</tr>
<tr>
<td>9</td>
<td>UNESCO, France</td>
<td>21</td>
<td>University of the West Indies, USA</td>
</tr>
<tr>
<td>10</td>
<td>FMI, Finland</td>
<td>22</td>
<td>University of the West Indies, USA</td>
</tr>
<tr>
<td>11</td>
<td>PLOCAN, Spain</td>
<td>23</td>
<td>University of the West Indies, USA</td>
</tr>
<tr>
<td>12</td>
<td>Oregon State University, USA</td>
<td>24</td>
<td>University of the West Indies, USA</td>
</tr>
</tbody>
</table>

**Community White Paper, Frontiers Marine Sciences, OceanObs’19**
Outline

The OceanGliders program
A component of the integrated GOOS

OceanGliders - BOON
Bringing Sustainable observation to the ocean boundary regions

The role of JCOMMOPS
Technical support to the ocean observations program’s development

Metadata: The key toward an integrated system
OG1.0: a global glider format
OceanGliders in the next decade
Bringing Sustainable observation to the ocean boundary regions

recommend that OceanGliders develop an implementation plan for a sustained Boundary Ocean Observing Network to meet the societal needs of improving ocean observing in this key region of the global ocean.
recommend that OceanGliders develop an implementation plan for a sustained Boundary Ocean Observing Network to meet the societal needs of improving ocean observing in this key region of the global ocean.
OceanGliders in the next decade
Bringing Sustainable observation to the ocean boundary regions

Global coverage target : 100 sustained gliders lines and areas by 2030

recommend that OceanGliders develop an implementation plan for a sustained Boundary Ocean Observing Network to meet the societal needs of improving ocean observing in this key region of the global ocean.

Next Steps

• Highlight the need for a sustained glider network
• Work to develop monitoring capability in under sampled areas
• Link to forecasting systems
• Develop regional products

BOON: A BOUNDARY OCEAN OBSERVING NETWORK

- Surface currents
- Subsurface currents
- Nutrients
- Particulate matter
- Dissolved Organic carbon
- Phytoplankton biomass & diversity
- Zooplankton biomass & diversity
- Fish abundance & distribution
- Ocean Color
- Ocean Sound

Global coverage target is 100 sustained observing lines and areas by 2030
The OceanGliders program
A component of the integrated GOOS

OceanGliders - BOON
Bringing Sustainable observation to the ocean boundary regions

The role of JCOMMOPS
Technical support to the ocean observations program’s development

Metadata: The key toward an integrated system
OG1.0: a global glider format
The role of JCOMMOPS

Governance

UN Agencies, Joint Commission, Observing Networks

Coordination Monitoring Support

OPA  DMPA  SFSPA
The role of JCOMMOPS

Governance

Recently integrated into the scope of JCOMMOPS – May 2019
The role of JCOMMOPS
Technical support to the ocean observations program’s development

- Resources
  - Premises hosted by Ifremer (Brest - FRANCE)
  - IS powered by CLS (Toulouse - FRANCE)
  - 7-person team: 4 TCs, 2 IT, 1 oceanographer Sc./communication/outreach
  - JCOMMOPS funded by yearly voluntary contributions from MS and EU

2018 JCOMMOPS Contributors
The role of JCOMMOPS

International partners

Based on operational platforms registered at JCOMMOPS as of June 2018
The role of JCOMMOPS
Implementation, Data/Metadata exchange, Monitoring

- Coordinate all actors
- Encourage collaborations and the free exchange of data/metadata
- Facilitate the access to the Exclusive Economic Zones (EEZ notifications)
- Assist in the implementation and deployment of the observing networks
- Encourage the data harmonization and we evaluate the performance of the system
- Improve the overall effectiveness and development of the system
- Develop and provide the tools to monitor the observing system status and the data/metadata distribution

10,000 instruments deployed at the sea for observing the ocean

La Seyne sur Mer – Journées Nationales Gliders 2019

Generated by www.jcommops.org, 04/06/2019

Septembre 2019
The role of JCOMMOPS: Distribute metadata and monitor the networks

- Monthly authoritative status maps: [www.jcommops.org/map](http://www.jcommops.org/map)

- Annual JCOMM Report Card to inform ocean observing stakeholders, society and decision-makers about the status and value of the GOOS: [www.jcommops.org/reportcard](http://www.jcommops.org/reportcard)

- Web application to make query, maps, graphs, stats, 3D data visualization: [www.jcommops.org](http://www.jcommops.org)

What can we do with it?
The role of JCOMMOPS: Communication and outreach

Disseminate the importance of the ocean observations

- Participation to local/international ocean observations-related events
- Educational activities in the classrooms
- Collaboration with civil society (race yachts, ONGs, boaters)
Outline

The OceanGliders program
A component of the integrated GOOS

OceanGliders- BOON
Bringing Sustainable observation to the ocean boundary regions

The role of JCOMMOPS
Technical support to the ocean observations program’s development

Metadata : The key toward an integrated system
OG1.0 : a global glider format
Metadata: The key toward an integrated system
OG1.0: a global glider format
Metadata: The key toward an integrated system

OG1.0: a global glider format
Metadata : The key toward an integrated system

OG1.0 : a global glider format
**Metadata : The key information toward an integrated system**

OG1.0 : a global glider format

**Recommendations**

- recommend the development of a global data management system to ensure the effective sharing and use of ocean data from underwater gliders.
- recommend that OceanGliders develop an implementation plan for a sustained Boundary Ocean Observing Network to meet the societal needs of improving ocean observing in this key region of the global ocean.

**Needs**

- Hamonization of the glider format across Data Assembly Center
- Harmonization of the metadata mandatory information across glider groups.
Metadata: The key information toward an integrated system
OG1.0: a global glider format

Recommendations

- recommend the development of a global data management system to ensure the effective sharing and use of ocean data from underwater gliders.
- recommend that OceanGliders develop an implementation plan for a sustained Boundary Ocean Observing Network to meet the societal needs of improving ocean observing in this key region of the global ocean.

Needs

- Harmonization of the glider format across Data Assembly Center
- Harmonization of the metadata mandatory information across glider groups.

Strategy

- Agreement on a label OG1.0: under review Comparative analysis of glider formats and requirements toward OG1.0)
- Harmonization of the metadata mandatory information across glider groups: OceanGliders Reference tables
- Development of JCOMMOPS website to integrate properly OceanGliders activity
- Development of (meta)data management tools for easy implementation
Metadata: The key information toward an integrated system

OG1.0: a global glider format and a new data flow

JCOMMOPS metadata
integrated system

Metadata upload

limited glider group

Data

metadata

OG1.0

Data diffusion in RT

Data archiving

complete glider group

metadata
Metadata: The key information toward an integrated system
OG1.0: a global glider format and a new data flow

Data diffusion in RT  Data archiving

limited glider group → metadata

JCOMMOPS online tools → Metadata file

OceanGliders processing chain → OG1.0

Metadata upload → JCOMMOPS metadata

complete glider group → metadata

Data archiving
Metadata: The key information toward an integrated system

OG1.0: a global glider format and a new data flow
Metadata: The key information toward an integrated system

OG1.0: a global glider format and a new data flow

metadata QC: Feedback loop between TC and glider group

JCOMMOPS metadata integrated system

Metadata QC: Feedback loop between TC and glider group

Data diffusion in RT

Data archiving

JCOMMOPS online tools

Metadata file

OceanGliders processing chain

Metadata upload
Thanks for your attention!

See *in situ* and emerging networks tables for map legend. Symbol size is not to scale, in the maps they are exaggerated to an order of hundreds kilometers for readability.
The OceanGliders program
A component of the integrated GOOS

Mean sections of geostrophic velocity from the Atlantic and Mediterranean and Indian Ocean. In the Atlantic are (a) the North Atlantic Current west of the UK, (b) the Nova Scotia Current off the east coast of Canada, (c) the Gulf Stream off the eastern US coast, (d) the Gulf of Mexico Loop Current. Sections in the Northern Current System of the Mediterranean Sea are (e-h) along the southern coast of France, (i) between the Spanish coast and the island of Ibiza. Community White Paper, OceanObs’19

Sustained glider observations in the ocean boundaries

Chair: Dan Rudnick, SCRIPPS

Mailing list: og-boundary-network@jcommops.org
The OceanGliders program
A component of the integrated GOOS

Increase extreme weather forecast with unique ocean observations

Chair: Scott Glenn, Rutgers University

Mailing list: og-storms@jcommops.org

(a) Hurricane Gonzalo track forecast, (b) minimum sea level pressure, (c) maximum wind forecast, along with the best track. Gliders improve hurricane forecast. The dashed line denotes the track location closest to the glider at 0000 UTC 13 Oct 2014 (Dong et al. 2017)
The OceanGliders program
A component of the integrated GOOS

Monitor shelf/open sea water formations & (sub)mesoscale variability

Chair: Pierre Testor, CNRS – LOCEAN

Mailing list: og-water-transformation@jcommops.org

Some highlights of (sub)mesoscale oceanic processes revealed by gliders that have been identified as important for the functioning of the physical, chemical and biological ocean (Community White Paper, OceanObs’19)
The OceanGliders program
A component of the integrated GOOS

Chair: Grace Saba, Rutgers University
Mailing list: saba@marine.rutgers.edu

Chair: Emma Heslop, IOC/UNESCO
Inmaculada Ruiz, SOCIB
Mailing list: e.heslop@unseco.org
iruz@socib.es

Chair: Dan Hayes, UC-UCY
Victor Turpin, JCOMMOPS
Mailing list: og-dm@jcommops.org