Deployment Opportunities for Argo

Argo TC, M. Belbeoch
Ship TC, M. Kramp
Argo & Logistics

• To deploy 1000 units / year:
  – a continuous and intense effort for Argo teams
  – Planning cruise, preparing floats, shipping, customs, etc.
  – Subject to changes, float delivery, funding rhythm, problems.

• A global array can’t be maintained using the same lines.

• We start to see some accumulation zones

• Areas are still to be sampled after 12 years of Argo

• Development of co-operations at sea using synergies between GOOS programmes:
  – a domain where JCOMM concept can be tangibly efficient.
Aim

• How can I deploy/retrieve/service my instrument(s) at x,y,t in the global ocean?

• JCOMMOPS takes the challenge to be the focal point:
  – Dedicated resource serving the community
  – Centralized information system
  – Development of innovative solutions

• Long run vision (10 years ...)
Ship TC

• 3 years of preparation:
  – Justification, paperwork
  – Money engineering
  – Negotiations with host
  – Recruitment process
  – ..
Since 2013, JCOMMOPS has a ship coordinator: Martin Kramp

<table>
<thead>
<tr>
<th>Technical Coordination</th>
<th>2/3</th>
<th>SOT (SOOP, VOS, ASAP)</th>
<th>1/3</th>
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<tr>
<td></td>
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<td>GO-SHIP</td>
<td>1/3</td>
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<td>JCOMMOPS</td>
<td>1/3</td>
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- The ship coordinator, per ToR, works part-time for SOT (including VOS and SOOP) and GO-SHIP, which already means he is in contact with volunteer ships and research vessels in his day-to-day work.

- A third of his time is dedicated to cross-program ship-related issues, in particular deployment opportunities.
Ship TC

• A year of activity:
  – Immediately operational and productive
  – Reactivity, efficiency, creativity, quality
  – Team spirit

• Met key actors and started communication

• Finalized, initialized partnerships with RV focal points, charters, sailing community, industry.

• Act as coordinator for SOT and GO-SHIP.

• Funding (Year1):
  – SOT/DBCP – JCOMMOPS – GOSHIP
Integrated Ship Coordination

JCOMMOPS works with all potential players on deployment, retrieval, service and other operations across all programs

- Research Cruises
- Commercial Shipping
- Charter Missions
- Sailing Community
- Other Resources (Navy...)

Send your request to mkramp@jcommops.org
Including industrial partners (tests)
Research Ships

The GO-SHIP coordination allows for immediate synergies, and the cruise plans gathered at JCOMMOPS already serve now to plan deployments of floats (including BGC) and drifters.

With the support of other organizations, further RV data can now be accessed by JCOMMOPS, and an automated synchronization between the data bases and, on-line access is under finalization.

- Data from individual institutes or ship owners (such as SIO, AWI)
- Data from group organizations (such as UNOLS, IRSO)

The gathered data contain in particular cruise plans and ship capacities (berths, deployments, mooring work)
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Commercial Shipping

Drifters have been optimized for deployments from container vessels, but some Argo operators also use these volunteer ships for deployments - in particular on XBT lines with rider.

Ongoing discussions target:
- Freight (already involved in substantial VOS/SOOP observations)
- Oil & Gas (make it “green”), Cable
- Fishing (operating in key zones such as Indian Ocean)
- Liners (exploiting deployments as touristic attraction / eco-label)

Ongoing pilot project with the German Weather Service (DWD):
- Strong VOS program (#2 behind USA) with many ships on crucial lines
- Only a few shipping companies involved, with strong commitment
- Hamburg focal point: DWD, BSH, ships and shipping companies HQs
- Extended role for DWD PMOs (particularly logistics)
A typical Month in the DWD-VOS Program

Most of the lines are occupied more than once per month
Charter Missions

Without dedicated charter missions, the arrays would already face more important gaps.

Cost-free deployments do not exist: Volunteer ships cover only ship time, most often cannot deploy in ideal positions and some instruments get lost during these operations at full ship speed.

In cooperation with Pro Large Partner, we propose professional cross-program missions with different vessel types, particularly:

- Polar vessels in the northern polar areas.
- An innovative fast multirole vessel in risky areas, for cost-efficient and substantial operations.
- Professional sailing vessels in non-piracy and non-ice areas.

JCOMMOPS through its partners can provide solutions for ALL sea areas.
How to fund charter missions

• Difficult to fund ship time from national budgets
  – Floats, science, data management, infrastructure
  – Shipping
  – Why not going slightly further with the deployments?

• A national budget could include this «fee per float» for deployments (+10 to 20%)

• We can make partnerships with manufacturers so customer purchase «floats deployed anywhere».

• Guarantee/responsibility to work out:
  – Use: gentleman agreement
  – with JCOMMOPS floats ensured when arrive on-board.

• The earlier, the longer, the most cooperative, the cheaper...
CAPACITIES FOR SURVEY AND STUDY OF MARINE ENVIRONMENT

- Towing of HF sonar for survey of sea bed
- Sea bed characterization with multibeam sounder
- Towing of light geophysics system
- Implementation of ROV & AUV
- CTD profile
- Deployment of autonomous instruments
- Light mooring work
- Support of scientific campaigns in so-called « high risk areas » (Horn of Africa, Gulf of Guinea, …)

PERFORMANCES
- Operational range 3000 nm @ 18 kts
- Max sustainable cruising speed > 30 kts
- Max. range > 5000 nm @ eco speed
- Consumption < 2t /day @ eco speed
- Easy maintenance for large availability

Depending on annual rate of command, daily rates can drop below 5,000 EUR
Depending on annual rate of command, daily rates drop below 5,000 EUR (apart of 2t bunker: all inclusive for normal zones)

With a deployment every 3°, the ship could deploy 120 floats in 50 days, in optimal positions and conditions.

→ Costs per float 2kEUR without bunker

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Charter Missions

For best-price-and-practice charter solutions with Pro Large, the following grid is used, with piracy zones I1 and M5.
Lady Amber is on stand-by in Cape Town.

After its last mission, technical and administrative conditions have been evaluated and enhanced with Pro Large to a full-professional service, with particularly:

- regular checks of ship and crew
- proper insurance of the payload

The ship can store up to 100 instruments on board.

With a deployment every 3°, the ship could deploy 40 floats in 50 days, respecting seasonal winds.

→ Costs per float: < 2 kEUR
Upgraded by Pro Large: Lady Amber

The last mission was unfortunately impacted by:
Delayed delivery of instruments ➔ delayed departure ➔ other seasonal wind pattern ➔ longer cruise ➔ time-out of final floats

It will be difficult to find a more efficient charter solution. With such solutions clearly recommended by some of you, we request a clear feedback if this opportunity should be kept alive, or not - and why.

The ship can store up to 100 instruments on board.

With a deployment every 3°, the ship could deploy 40 floats in 50 days, respecting seasonal winds.

➔ Costs per float:
< 2 kEUR
Lady Amber

- Educational (official program with Mauritius)
- Inspired by South African partners
- Adopting a skipper, a float, etc...
- Any candidate for a cruise in 2014?
- Any funding available?
Sailing Community: New Opportunities

A number of pilot projects have been successfully initialized in the last few months and showed the unexploited potential.

It is important to distinguish between Charter, Rally, Race, NGOs and individual ships.

<table>
<thead>
<tr>
<th>No of Instruments</th>
<th>Complexity logistics</th>
<th>Precise Positions</th>
<th>Handicap competition</th>
<th>Education</th>
<th>Communication</th>
<th>Costs</th>
<th>Repeat</th>
<th>Pilot project</th>
</tr>
</thead>
<tbody>
<tr>
<td>Charter</td>
<td>++</td>
<td>++</td>
<td>++</td>
<td>+</td>
<td>-</td>
<td>--</td>
<td>++</td>
<td>Lady Amber</td>
</tr>
<tr>
<td>Rally</td>
<td>+</td>
<td>+</td>
<td>0</td>
<td>+</td>
<td>++</td>
<td>+</td>
<td>+</td>
<td>Cornell Odyssey</td>
</tr>
<tr>
<td>Race</td>
<td>-</td>
<td>+</td>
<td>--</td>
<td>+</td>
<td>++</td>
<td>+</td>
<td>+</td>
<td>Barcelona</td>
</tr>
<tr>
<td>NGO</td>
<td>0</td>
<td>0</td>
<td>+</td>
<td>++</td>
<td>0</td>
<td>0</td>
<td>+</td>
<td>Volles Sans Frontières</td>
</tr>
<tr>
<td>Individual</td>
<td>--</td>
<td>--</td>
<td>+</td>
<td>++</td>
<td>--</td>
<td>--</td>
<td>0</td>
<td>OceanoScientific</td>
</tr>
</tbody>
</table>

++ very positive - good for us
-- very negative - bad for us
0 neutral

All approaches have different pros and cons, but all have been established with high enthusiasm, and all were successful or are still underway.
Sailing Community: Rallies

Rallies lead groups of private sailing ships across the oceans in an organizational framework.

Social and security networks are for these non-competitive events the driver, they follow clear routes and schedules.

Rallies are repeated regularly (1 – 4 years between events).

The pilot project was established last November, and a lottery had to be organized to distribute the 4 test instruments: All ships wanted to deploy, many with children on board.

The success resulted in a MoU on free deployments between IOC, JCOMMOPS and the main organizer of these events, J. Cornell.

Up to 250 yachts participate in the same event and could deploy.
Sailing Community: Examples for Rallies
Sailing Community: Races

Races lead groups of high-tech yachts, short-handed or fully crewed, non-stop or in several legs, all around the world.

Races are repeated regularly (mostly 4 years between events).

The pilot project will be established late 2014 within the Barcelona World Race (~ 12 ships with 1 float each)

Deployments are mandatory per Racing Instructions on a date tbd by the organizer with the scientific partner.

In future races, the teams will even fund the instruments they will deploy and donate them to IOC-UNESCO.

The number of instruments is less important, but these events also attract the media very much and have educational potential.
Sailing Community: Examples for Races

Many events lead around the world and start every few years.
BWR

- Dec. 2014
- Indian Ocean gaps
- .com/edu.
- Candidates?
SECOND ANNOUNCEMENT

The 2nd International Ocean Research Conference (IORC) is an opportunity for the scientific community to come together to plan the coming decade of international collaboration in marine science and technology, with a view to improving ocean governance. The inaugural IORC was held in June 2005, when the Intergovernmental Oceanographic Commission of UNESCO (IOC-UNESCO), together with The Oceanography Society (TOS), brought attendees together to discuss expected developments in marine sciences in the decade that followed. Now, almost ten years later, the same institutions are convening the 2nd IORC to review progress made in ocean science in the last twenty years, and plan ahead in light of important policy developments such as The Future We Want (UNCSW Rio+20) and Future Earth.

Read the 2nd Announcement:  Read the 1st Announcement:
Sailing Community: NGOs and Individuals

JCOMMOPS has organized in several seasons deployments with specialized NGOs, which act as focal point and facilitate communication & logistics with many ships.

Per instrument, around 500 EUR are invoiced, but the floats are deployed smoothly from trained crews in precise positions.

The number of such NGOs is growing, JCOMMOPS worked or discussed until now with VSF, MerOceans, RIEM and STW.

In special conditions the effort to work with individual sailing ships could also be justified, if they
- call in a port with a partner institute or warehouse
- sail in areas with no other deployment opportunity
- could store an important number of instruments
Sailing Community: Example NGO

MerOceans works with ships like Bark EUROPA or NAVOSE Boogaloo, which, beyond deployments, also carry underway (OSC) Systems.
Sailing Community: Example Individuals

S/Y Chamade (12m) called in San Diego before crossing the Pacific and Luca Centurioni handed out 2 instruments in front of Scripps.
Conclusion

In the last few months, JCOMMOPS Ship Coordination made good progress and many solutions have already been proposed.

Contacts have been established with key players from all involved or potential parties (RVs, Charter, NGOs, etc) and discussions go on.

Manual matching of needs and opportunities is already possible today and only requires to follow the procedure with form.

Synchronization with other data bases is planned to provide more automated propositions, tables and maps.

Pilot projects have been established for rather innovative solutions or are underway.

The solutions we propose combine needs from different programs: Argo, DBCP, OceanSITES, SOT (VOS, SOOP, ASAP).
Drop floats in red areas!
conclusion

• Planning !!!

• Support Ship TC concept

• Do not hesitate to use the « service »

• Operations, communication, coordination and integration.

• Long run opportunities (deploy / retrieve / service)

• We need floats (and demo floats) to run and test partnerships

• Martin is already in Brest where JCOMMOPS will officially move (see 5.7)

• JCOMMOPS is fostering a new standard for sailing races and even raising competition between foundations
Thanks

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