

ICAN developments. Activities over the last year in regard to outreach and training are outlined along with successful efforts to engage additional members in the Network. Finally a medium to long-term strategy for ICAN and a potential governance model for the Network are presented. These will help to give a coherent focus to the activities and underpin the structure of ICAN therefore securing its future and enhancing its relevance among those interested in the future of coastal areas worldwide.

ICAN GOVERNANCE

As discussed at ICAN 3 (Dwyer and Wright, 2008), in order for ICAN to function properly a governance structure is vital. Therefore the workshop began with presentations and discussions led by John Helly of the San Diego Supercomputer Center/Scripps Institution of Oceanography and Roy Lowry of the British Oceanographic Data Center. Both have been involved over the last year in proposing and structuring possible governance models for ICAN. The discussion began with a consideration of what other organizations exist in the world that are similar to ICAN? One end member suggested by John was the Internet Engineering Task Force (IETF; <http://www.ietf.org>), a large, open international community of network designers, operators, vendors, and researchers concerned with the evolution of the Internet architecture and the smooth operation of the Internet. The actual technical work of the IETF is done in its working groups, which are organized by topic into several areas (e.g., routing, transport, security, etc.). Much of the work is handled via mailing lists. The organization holds meetings three times a year, and membership is open to any interested individual. It is a flat, decentralized organization that is funded in different ways and at different levels.

Another end member is an organization such as the Open Geospatial Consortium (OGC; <http://www.opengeospatial.org>) or the Consortium for Ocean Leadership (<http://www.oceanleadership.org>). These organizations involve a hierarchical system of officers, board members, and staffers, both paid and voluntary. They are much more centralized and charge significant membership fees (e.g., OGC membership fees range from \$55,000 for principle members to \$500 for individual associate members). The pros and cons of these end-member governance examples are presented in Table 1.

Table 1. Comparison of Reference Governance Examples

Governance Type	Pros	Cons	Examples
<ul style="list-style-type: none"> • De-centralized • Voluntary • Loosely hierarchical 	<ul style="list-style-type: none"> • Low cost • Flexible • Motivated • Community-based • Reputation-building 	<ul style="list-style-type: none"> • Unreliable funding • Unreliable progress • Peer pressure accountability 	<ul style="list-style-type: none"> • Internet Engineering Task Force (IETF)
<ul style="list-style-type: none"> • Centralized • Paid and voluntary 	<ul style="list-style-type: none"> • Funded • Many levels of membership 	<ul style="list-style-type: none"> • Costly • In-the-club of not • Tends to mature 	<ul style="list-style-type: none"> • Open Geospatial Consortium,

- | | | | |
|---|--|---|---|
| <ul style="list-style-type: none"> • Strongly hierarchical | <ul style="list-style-type: none"> • Well-understood standard operating procedures • Project management principles | <p>and become organizationally protective</p> | <p>Inc. (non-profit)</p> <ul style="list-style-type: none"> • Consortium for Ocean Leadership (non-profit) |
|---|--|---|---|

Somewhat in the middle of the spectrum is the Global Spatial Data Infrastructure (GSDI) Association, where most of the work is done by volunteers. There is a range of membership fees, especially to accommodate those from developing nations, and the organization brings in annual revenues (~\$40-50,000) from holding conferences. So unlike the OGC, which started off as a non-profit venture, GSDI (as well as the European Umbrella Organisation for Geographic Information or EUROGI) started off as conferences and went into the realm of non-profit organizations. They now have an essentially scaled-down OGC-type structure in terms of being an “association of associations,” including also members from industry. It was pointed out in the discussion that ICAN should consider keeping its membership as broad as possible, perhaps even down to the level of individual members.

In identifying the best governance model for ICAN, the group discussed the value of ICAN at this stage in its development, which can be found in its:

- ❖ Web presence, with services and resources therein.
- ❖ Implementation stack (stack of software and preferred implementation approaches, made freely available to participants and advancing the interests of coastal community).
- ❖ Interoperable layer discovery (building a local ontology, building specified technologies such as semantic mediators, and mapping into ICAN master or global ontology).
- ❖ Outreach to the community by way of lessons to be learned from experiences of others, best practices across state boundaries or national boundaries; sharing best practices, networking via workshops, social context.

There was encouragement for ICAN to continue to think about *tangible* products that will advance the interests of the ICAN community. An example cited by John, was that one of IETF’s keys to success is that they don’t let topics come to the table only because they sound good. They require that someone has working software in order for it to be included in the framework of Internet protocols. ICAN will seek to develop a common method developed for creating a coherent, self-consistent map of the coastal zone. We have the potential to build a high-resolution international coastline, as there is no current, existing definition for such. This might be a core vector data set that ICAN can create as a community, and claim as an ICAN product (a global coastline is being created by GSDI, at ~1:100,000, but is not suitable for local coastal management. ICAN could potentially create a much higher resolution product for local municipalities.

Updated ICAN Governance Model

At ICAN 3, the formation of three main bodies was suggested to steer the strategic and technical activities of ICAN. These were revisited at ICAN 4 and renamed the Steering Group (SG), Management Working Group (MWG), and the Technical Working Group (TWG).

Steering Group (SG)

Membership in the SG should be based on the unique contributions a member would make from a political, technical or financial aspect to the advancement of ICAN goals. The SG is responsible for providing valuable direction for the MWG and TWG based on their various expertise. The SG would be a more restrictive selective body, and would provide a check-and-balance for the MWG.

- ❖ **Composition:** Membership in the SG should be based on the unique contributions a member would make from a political, technical or financial aspect to the advancement of ICAN goals. The SG will be comprised of individuals who will have little time to devote to this enterprise but have a strong interest in the goals of ICAN. Their role is to articulate the vested interests of the organizations they represent and to interpret and negotiate with the MWG.
- ❖ **Roles and Responsibilities:** The role and responsibility of SG members is to review and comment on the published policies of ICAN, contribute to the agenda for meetings, and participate in any ICAN event (listed and defined in Table 2 below).
- ❖ **Continuing Membership:** Membership will be occasionally reviewed by the working groups and pruned on the basis of active participation and contributions to the goals of ICAN.
- ❖ **New Members:** Membership beyond the initial complement will be added by a process of open nomination from any member of the ICAN working groups and accepted or rejected by a vote of the working group membership.

Management Working Group (MWG)

The Management Working Group (MWG) has the responsibility for the functions listed in Table 2. In summary, the MWG is the public-facing aspect of the ICAN and is responsible for all funding, operations, external relations and documentation.

- ❖ **Composition:** The MWG will be comprised of individuals who provide active leadership to the activities of the ICAN, contributing time and labor to the established strategic objectives and priorities (e.g., funding efforts, event organization, etc.).
- ❖ **Roles and Responsibilities:** The role and responsibility of each MWG member is to carry out the functions listed and defined in Table 2 below.
- ❖ **Continuing Membership:** Membership will be occasionally reviewed by the working groups and pruned on the basis of active participation and contributions to the goals of ICAN.
- ❖ **New Members:** Membership beyond the initial complement may be extended to include a representative of a new coastal atlas added to ICAN.

Technical Working Group (TWG)

The TWG is the team of individuals that defines, implements and deploys the cyberinfrastructure for the ICAN technical projects, including the governance of what OGC and other kinds of standards and profiles ICAN is adopting. There may be necessary offshoots of the TWG such as an ontology content governance group.

- ❖ **Composition:** The TWG will be comprised of individuals who contribute their technical expertise through voluntary efforts organized into domain-specific or discipline-specific

working groups (WGs) with published charters. Membership in any of these WGs is open to any interested participant.

- ❖ **Founding:** The initial membership of the TWG will be founded from interested individuals from the ICAN coastal atlases and existing activities. WG chairs should be established by volunteers who agree to define their area of technical effort and its relevance to ICAN strategic goals and to draft an initial charter and technical documents appropriate to the activity.
- ❖ **Roles and Responsibilities:** The role and responsibility of each TWG member is to carry out the functions listed and defined in Table 2 below.
- ❖ **Continuing Membership:** Membership will be occasionally reviewed by the working groups and pruned on the basis of active participation and contributions to the goals of ICAN.
- ❖ **New Members:** Membership beyond the initial complement will be added to include a single representative of coastal atlases added to ICAN, as well as any new ICAN member with an active interest in the topics covered.

The group also discussed the need for an External Advisory Group of experts so that the SG and MWG in particular may be able to gain perspectives and advice on the strategic directions of ICAN. This external advisory group might be composed of those who have done similar technical work in more mature organizations (such as the Marine Metadata Interoperability initiative, the Directorate General for Maritime Affairs and Fisheries of the EU or DG-MARE, industry members, etc.) or those with a strong knowledge of our coastal user communities, giving those communities an even stronger voice and representation.

The relationship between all of the above working groups is illustrated in Figure 1. With regard to funding, as shown in Figure 1, there was discussion of the need for a set of criteria that are essential for ICAN to grasp in order to organize into a larger entity. At some point, ICAN will need to develop a business model with some sort of legal structure that will be made into an integral part of the governance structure. It very much comes down to showing value or benefit of ICAN (i.e., the value of belonging to ICAN).

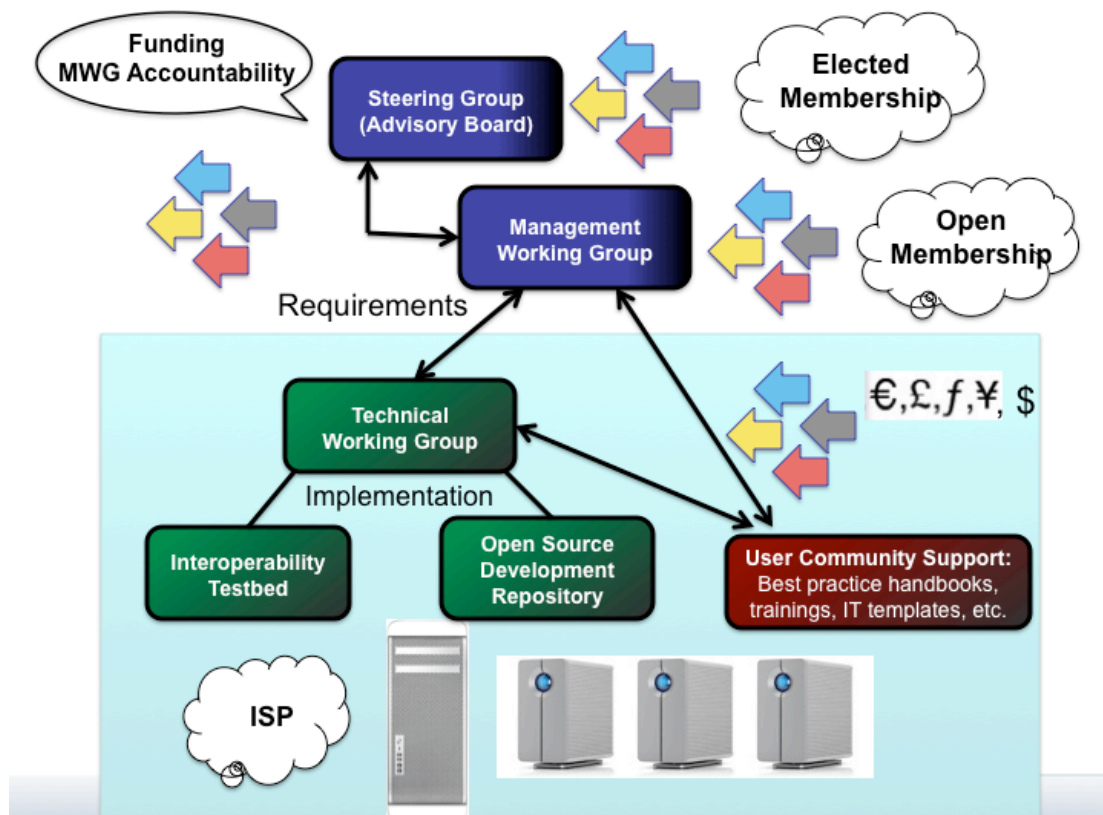


Figure 1: Illustration adaption from an original by John Helly of the updated governance model for ICAN including the three main working groups: Steering, Management, and Technical, the requirements for which are indicated in the paragraphs above, and the implementation details for which are found in Table 2.

The workshop participants split into breakout groups to consider and finalize primary and secondary roles for the SG, MWG, and TWG, as well as short descriptions of the responsibilities and tasks of each working group. This is detailed in Table 2. Table 3 lists the initial volunteers for each of the working groups (co-chairs in bold).

Table 2. ICAN Organizational Roles and Responsibilities. <i>Key: X = Lead Group; x = Contributing Group</i>			
Function	Steering Group	Management Working Group	Technical Working Group
Data or Product QA/QC – standards and practices; ensure quality of ICAN products; MWG sets general principles; TWG is advisory in this role, may even be the ones to discover a problem (e.g., metadata quality, standards conformance, ontology quality).		X	x
Policy – by-laws, incorporation, roles and responsibilities (inc IPR), standard operating procedures; Policy lays out objectives that trickle down to implementation (procedures) (e.g., By-laws of OGC, EUROGI, GSDI) – charter, terms of ref may be more appropriate for ICAN?; Who we are, how we operate, how we relate to other orgs	X		
Oversight of Mgmt Group – strategic priorities are part of this	X		
Standard Operating Procedures – the “how” in relation to policy (objectives)		X	
Priorities – e.g., what we will do in the next year; funding priorities, MWG functions; Strategic, Tactical, Operational? General priorities at SG level, further defined and managed by MWG.	x	X	x Technical project management priorities.

Table 2. ICAN Organizational Roles and Responsibilities. <i>Key: X = Lead Group; x = Contributing Group</i>			
Function	Steering Group	Management Working Group	Technical Working Group
<p>Intellectual Property – access to content, use of content and services; who signs agreements? Agreements between data owner and who wants to access data/info; IPR is owned by data owner/service provider GSDI example: steering sets policy and Mgmt implements; ICAN SG would sign actual agreements; take into account ICAN members who are members of sister orgs. dealing w/those issues.</p>	X Issue resolution	x Specification of licensing terms of tools and products produced by ICAN.	x Conformance to licensing terms of tools & data products used and developed by ICAN.
<p>Stakeholder Representation – engages stakeholders, puts together programs, resources for them Stakeholder Def 1 = user communities, data providers (e.g., state gov); CWA is there to serve local gov; those w/ an interest in the activity; vested interest Stakeholder Def 2 = funding provider Stakeholder Def X Define levels of interest too – user perspective, or “this is useful, I want to contribute resources,” license and attribution provider Steering could handle funding stakeholders; Mgmt could handle use stakeholders Could be separate user groups for different stakeholders</p>	x	X	

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Function	Steering Group	Management Working Group	Technical Working Group
<p>Funding – this is the responsibility of writing proposals to get the funding; engaging the funders (e.g., agency or foundation visits, etc.); Steering group IDs major sources of funding, gives guidance as to where to expend efforts Mgmt group picks an opp according to a priority and writes proposal, often in concert w/Tech as necessary Who would be a PI?? Mgmt w/Tech Funding for holding a workshop or conference might fall to Steering, but funding to advance use case or interop or develop new CWA might fall to Mgmt/Tech</p>	x	X	x
<p>Operations (w/Finance) – managing, reporting budging, compliance activities; Steering raises red flags if they see Mgmt going down wrong road</p>		X	
<p>Communications & Public Relations – internal w/in ICAN as well as external public relations</p>		X	

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Key: X = Lead Group; x = Contributing Group			
Function	Steering Group	Management Working Group	Technical Working Group
<p>Membership – levels of membership; look at a number of working examples where issues have been worked out over the years (willing to pay model); impt voices to be heard; GSDI model (board is elected), some orgs pay \$25K, some \$5K, down to individual membership which ends up doing a lot of work, indiv members able to sit on board?</p> <p>EUROGI each member org puts people forward to serve on council (Steering) – can be unwieldy</p> <p>Roger & Tim’s project</p> <p>ICAN needs to become legal body at some point to attract funding, maintain stability</p> <p>UCGIS model is institution member only</p> <p>Should ICAN consider being subsumed under an existing group such as GSDI?</p> <p>Might decrease heavy admin functions</p> <p>OGC now has thematic working groups but these are very small</p> <p>GSDI? Wrap CoastGIS into ICAN?</p> <p>Revisit incorporation issue in about 12 months time</p>		X	
Marketing & Events		X	
<p>Liaison with Service Providers – e.g., we put up an ICAN service for which we need to buy equipment, buy a service; anything dealing w/vendors, entering into a <i>commercial</i> contract</p>		X	
<p>Outreach –</p> <p>Papers, posters, presentations at conferences, etc. Participating in working groups, panels, etc</p>		X	x

Table 2. ICAN Organizational Roles and Responsibilities. <i>Key: X = Lead Group; x = Contributing Group</i>			
Function	Steering Group	Management Working Group	Technical Working Group
Technical “Things” – Requirements, architecture, standards incorporation and implementation and guidance			X
Data & Products Delivery – Data providers and ICAN data products. Interfaces into data sources. Helping data providers to interface with ICAN	x		X
Interoperability Compliance – Semantic mapping and bridging between data providers. Selecting and promoting best practices and architectures.			X
Metadata – FGDC, ISO 19115, INSPIRE OAI, etc. Getting it populated/provided. Defining minimum required elements. Development of metadata capture methods. Legal requirements for most govt bodies Steering/Mgmt says this might also be a subset under Interop Compliance			X
Network Services & Deployment – Web services.			X
Standards – Identification, adoption, development of technical specifications that facilitate interoperability. Steering/Mgmt says this might be a subset under Interop Compliance			X
User Support – Communicating with technical users to solve their problems.			X

Table 2. ICAN Organizational Roles and Responsibilities. <i>Key: X = Lead Group; x = Contributing Group</i>			
Function	Steering Group	Management Working Group	Technical Working Group
Training & Documentation – Workshops, technical cookbooks, user support, online help, developing ICAN website content.		X	X
Atlas Inventory & Assessment – need data from technical group to complete assessment; tech team incorporated into a survey; about setting priorities but Mgmt group will implement this along with Tech Need inventory in order to do assessments: user assessment and developer/administrator assessment	x	X	x
Interface Extension – user interface to interop prototype Further work on the ICAN portal interface prototype, development of additional access methods			X
Steering Group	Management Working Group		Technical Working Group
<ul style="list-style-type: none"> • Roger Longhorn • Kathy Taylor • Kathy Belpaeme • Val Cummins • Tony LaVoi • Andrus Meiner • Tim Nyerges • Gonzalo Malvarez-Garcia • Ronan Uhel Plus External Advisory Group	<ul style="list-style-type: none"> • Ned Dwyer • Dawn Wright • Marcia Berman • Alejandro Iglesias-Campos • Luis Conti • John Helly • Kathrin Kopke • Mika Odido • Sean Paddy 		<ul style="list-style-type: none"> • Roy Lowry • Liz O’Dea • Juan Arevalo-Torres • Luis Bermudez • Ramona Carr • Richard Cyganiak • Declan Dunne • Tanya Haddad • David Hart • Yassine Lassoued • Jose Ojeda-Zujar • Rita Silva • Hristo Stanchev

ICAN Membership Levels

Time did not permit discussion of the specific details of membership levels, beyond what was already established at ICAN 3 (Dwyer and Wright, 2008), and reproduced again here:

Participants in ICAN would need to sign up to a Memorandum of Agreement (MOA) or non-contractual arrangement that has clear objectives, milestones and deliverables. Participants can comprise two levels: *full participating membership* and *associate membership*. The former gives “executive” benefits in terms of defining the strategic direction of ICAN, objective setting and input to technical and business developments. The latter gives a passive benefit in being able to keep abreast of developments.

Associate Membership

Those with an interest in CWA come from a variety of backgrounds and represent a wide range of application areas. These include the following entities.

- Central/Federal Government (e.g., Defra; NOAA).
- Regional / Local Government including coastal groups (e.g., Flanders; Wisconsin State; Irish Coastal network).
- Content Providers (e.g., SeaZone/UKHO; NOAA).
- Industry Groups (e.g., Oil & Gas UK).
- Technology Providers (e.g., Google; ESRI).
- Research Groups (e.g., university research groups such as CMRC of University College Cork, Ireland, OSU; national research groups such as NERC-UK).
- Educational Bodies (e.g., universities, curriculum development groups).
- Inter-Governmental Bodies (e.g., EU; IOC; IMO).
- Non Profit Organisations (e.g., MapAction; World Wildlife Fund; OGC).

Memorandum of Agreement

The Memorandum of Agreement (MOA) drafted during the first ICAN workshop in Cork, Ireland (<http://workshop1.science.oregonstate.edu/mou>) forms a sound basis for an initial agreement between full participating members. It covers organisational commitment for participation by its employees in ICAN activities. An adaptation of this preliminary MOA reads:

Pursuant to the stated aims and objectives of the International Coastal Atlas Network (ICAN) we, the undersigned, are endorsing this Memorandum of Agreement. This is an agreement between the signatory institutions to jointly pursue funding and projects in the interest of advancing the utility and interoperability of coastal web atlases. Our goals are to develop a community of common purpose to improve collectively and individually the information resource represented by the existing resources and to develop standards and practices that will improve the value of these for the future.

These efforts will encompass information technology, geographic information systems, and data and metadata content standardization to enhance compatibility of information and interoperability of data systems. ICAN participants will be involved in the development and subsequent shared use of resources subject to which the developers have Intellectual Property Rights. ICAN participants agree to respect these rights by not distributing these resources without the developers' permission and by providing full acknowledgement to the developers where these resources are deployed.

What remains to be clarified is the identity of the entity signing up to the agreement. Is it an individual, a group, a department, or a ‘legal entity’ (e.g., NERC for BODC)? This needs to be clearly resolved.