14 October 2008

Dear Jesse,

Please find attached our revised NaGISA renewal proposal for the Census of Marine Life’s Synthesis Phase 2009-2010.

We thank the Census of Marine Life, specifically Ron O’Dor and Ian Poiner, for reviewing our renewal proposal, and for their strong support of the proposal and the NaGISA project in general. Both reviewers have made some very important suggestions to improve the proposal. In response, we included clarification of what we believe are the most important gaps in NaGISA’s global nearshore coverage and how this may affect our ability to answer our scientific questions and to provide new knowledge to the scientific community. We also have addressed more specifically our data management plans and linkages to OBIS. Thirdly, we clarified and expanded on how long-term monitoring as a legacy products will be pursued.

We also were provided the specific expectations that were formulated for the NaGISA project in 2006. There was not sufficient room in the proposal to address how specifically NaGISA has met or will meet these metrics and we have hence included our responses as Appendix B. We hope that this will serve well to explain where and how NaGISA has met these expectations, where the project has deviated from previous goals and what NaGISA sees as realistic goals.

This renewal proposal is the result of a very productive NaGISA group meeting in Venezuela in August 2008. This was an important meeting where NaGISA’s structure was substantially re-organized after Robin Rigby’s passing. This resulting proposal represents a collective group effort and is a specific, achievable and agreed-on work plan for NaGISA for the remaining two years.

We are very enthusiastic in joining the Census of Marine Life in its final synthesis phase and we thank you and the Sloan Foundation for the continuous support of the NaGISA project. Please let us know if there are any questions that NaGISA may be able to clarify further.

Sincerely,

Katrin Iken and Ann Knowlton
For the NaGISA team
University of Alaska Fairbanks Proposal

TO: Alfred P. Sloan Foundation  
630 Fifth Avenue, Suite 2550  
New York, NY 10111

FROM: Institute of Marine Science  
School of Fisheries and Ocean Sciences  
University of Alaska Fairbanks  
Fairbanks, AK 99775-7220

CONTACT: Office of Grants and Contracts Administration  
PO Box 757880  
Fairbanks, AK 99775-7560

TITLE: Natural Geography In Shore Areas (NaGISA)

PRINCIPAL INVESTIGATORS: Katrin Iken, Associate Professor  
Brenda Konar, Associate Professor

NEW/CONTINUATION: Continuation

DURATION: 2 Years

PROPOSED START DATE: 1 January 2009

UAF AMOUNT REQUESTED: $1,000,000

______________________________  8 Oct 08  
Katrin Iken  
Principal Investigator

______________________________  10/10/08  
Brenda Konar  
Co-Principal Investigator

______________________________  10/15/08  
David Christie  
Director  
GURU Unit  
School of Fisheries and Ocean Sciences

______________________________  10/29/08  
Andrew Parkerson-Gray  
Director  
Office of Sponsored Programs

______________________________  10/15/08  
Terry Whitlett  
Director  
Institute of Marine Science  
School of Fisheries and Ocean Sciences

______________________________  10/10/08  
Michael Castellini  
Associate Dean  
School of Fisheries and Ocean Sciences

October 2008
A Proposal for the Continuation of

Natural Geography in Shore Areas (NaGISA)

A Project of the Census of Marine Life

Proposal for 2009-2010

Katrin Iken, University of Alaska Fairbanks, USA (PI)
Brenda Konar, University of Alaska Fairbanks, USA (co-PI)
Yoshihisa Shirayama, Kyoto University, Japan (co-PI)

In collaboration with:

Lisandro Benedetti-Cecchi, University of Pisa, Italy
Juan Jose Cruz-Motta, Universidad Simón Bolívar, Venezuela
Edward Kimani, Kenya Marine & Fisheries Research Institute, Kenya
Patricia Miloslavich, Universidad Simón Bolívar, Venezuela
Gerhard Pohle, Huntsman Marine Science Centre, Canada

Ann Knowlton, University of Alaska Fairbanks, USA (Project Manager)
Tohru Iseto, Kyoto University, Japan (Project Manager)
1. Context

1.1. Overarching goals and scope:

NaGISA is a habitat-specific, quantitative survey of the world’s ocean shores, consisting of a series of standard transects from the high intertidal zone to a depth of 20 meters. NaGISA creates a nearshore biodiversity baseline from which scientific questions can be answered, long-term monitoring sites can be established, and stakeholders can become engaged.

NaGISA’s Overarching Goal is:

- to create the first global quantitative baseline of coastal biodiversity in rocky shores and seagrass beds.

Our baseline data and activities will:

- Answer scientific questions such as those regarding diversity patterns and their scales of variability, drivers of coastal diversity and the interactive effects of multiple drivers
- Improve the state of nearshore benthic taxonomy
- Identify hot spots of marine coastal biodiversity, suitable to become targets of increased monitoring, new Marine Protected Areas, or reserves
- Determine ranges of species and habitat distribution
- Increase coastal community marine awareness, interaction and involvement

1.2. Scientific questions, methods, and limits to knowledge:

As the nearshore component of the Census’ field projects, NaGISA’s past emphasis has been on field activities to establish the first global coverage of coastal biodiversity. In this endeavor, involvement of local stakeholders and education has always been a focus of NaGISA. Some of these field activities will continue to maintain the important ties and collaborations established in the past, but NaGISA’s main emphasis is now transitioning into synthesis. The global
standardized dataset allows NaGISA to ask novel questions about the status and patterns in nearshore biodiversity, and test previously established hypotheses on a worldwide scale:

- What are the various spatial and temporal scales of variability in distribution patterns of major nearshore taxa and of nearshore community biodiversity patterns?
- How do multiple drivers, including human activities and climate change, impact spatial patterns of biodiversity in marine coastal waters?
- Are trends in biodiversity similar in the subtidal and intertidal environments?
- Are there intertidal and subtidal hotspots of biodiversity where long-term monitoring or protected areas should be established?
- Can simple community attributes be identified that will allow us to establish reliable community-based, long-term monitoring? Are these community attributes identical for nearshore systems on a global scale?
- Can we confirm hypothesized latitudinal trends of decreasing biodiversity and increasing biomass at higher latitudes on a global scale and for multiple taxa?
- Do organisms become less abundant towards the ends of their ranges, and are these currently known species or habitat ranges correct?

One current limit to our ability to fully answer some of these questions is the challenge to identify all target taxon groups from all sites that have been sampled in time for synthesis. Other limits to our knowledge include the inadequate taxonomic resolution of some taxa, which may harbor a significant unrecognized portion of biodiversity. These are the areas where limited funds are the main problem for progress and NaGISA will appreciate assistance through the CoML network in seeking out additional sources for taxonomy funding. Yet other limits are the availability of continuous long-term data to test certain hypotheses on temporal variability in
biodiversity patterns. With NaGISA’s anticipated continuous efforts even beyond 2010, some of these limitations will eventually be resolved.

1.3. Notable accomplishments:

Creating global coverage in nearshore biodiversity is an ambitious task but NaGISA, with the development of new regional centers and sampling sites over the last two years, has established coverage along shores of all oceans, although gaps remain in global coverage (see Appendix B). NaGISA has accomplished important milestones in its two main focus areas, 1) to start answering important scientific questions about nearshore biodiversity patterns and variability, and 2) to raise marine coastal awareness in stakeholders through involvement and education. Several important scientific publications have disseminated the scientific findings of NaGISA. For example, important differences in biodiversity patterns in intertidal versus subtidal communities were discovered in the North Pacific (Hondolero et al., 2007; Chenelot et al., 2007; Konar et al., in press). Similarly, taxonomic resolution in the analysis of nearshore algal biodiversity patterns indicated differing resilience in intertidal and subtidal communities to taxonomic aggregation (Konar and Iken, in press). Further, NaGISA found that rare species are disproportionately important relative to their abundance in nearshore community structure under environmental fluctuations relative to common species within the community (Benedetti-Cecchi et al., 2008). Regional spatial comparisons in rocky communities in the Caribbean showed intertidal macroalgae to differ on larger scales (100’s km) than invertebrates (10’s km) (Cruz-Motta, 2007). NaGISA research has also resulted in discoveries of habitat distribution ranges, with the discovery of the northern-most East-Pacific rhodolith bed in Alaska (Konar et al., 2006) and a range extension of rocky substrate habitats with highly diverse communities in the Arctic Beaufort Sea (Iken et al., 2006). Much effort has been invested into the improvement of the
status of benthic taxonomy and has resulted in significant contributions to the scientific community. Field guides for southeast Asia and South America (e.g., Yasin et al., 2008; Häussermann and Försterra, in prep) have been published, as have multiple taxonomic papers with species descriptions (e.g., Adrianov et al., 2002; Chang et al., 2002; Kawai et al., 2008).

Outreach and education as a focal point of NaGISA’s mission has resulted in 30 taxonomic workshops on various taxa that have educated >600 emerging scientists in the field (see Table 2). In addition, an expanding network of high schools has entered into international collaborations and many university students now learn about NaGISA and coastal biodiversity through the inclusion of NaGISA monitoring protocols in class curricula. These outreach and education activities have resulted in important “buy-in” from the Nippon Foundation and Chevron in the western Pacific and Caribbean, respectively.

2. The Project

2.1. Overview of proposed work

In this renewal proposal we outline NaGISA’s main efforts for the period of January 2009 – December 2010, during which focus will be on project synthesis, cross-project synthesis, and contributions to the overall synthesis of the Census of Marine Life program. Traditionally the backbone of NaGISA has been fieldwork, for it is not only how NaGISA gets its data, it is how NaGISA involves its stakeholders. However, while NaGISA will always continue to do some fieldwork and look for collaborators to increase global coverage, the regional centers are now transitioning towards the integration of findings into regional and global synthesis products. That said, field activities will still play a larger role in regions that were established only recently (e.g., Atlantic Ocean, Polar Seas, Indian Ocean) as well as in regions where large areas remain as unstudied gaps. Similarly, several field collections are still in the process of being sorted and it
is our highest priority to get them taxonomically identified. Nevertheless, NaGISA’s goals for the final two years are synthesis-driven and structured in three tiers: regional NaGISA products, global NaGISA project synthesis products, and cross-project products integrating past, present and future patterns in coastal biodiversity (also see synthesis plan, Appendix D).

2.2. Regional NaGISA products

NaGISA is organized into eight geographic regions to obtain global coverage (see Figure 1). Important scientific and outreach products are planned within each region. Many of the questions regarding spatial variability, drivers of biodiversity and the identification of hot spots outlined above will be addressed on regional spatial scales.

Recent examples of such regional outcomes are the analyses of mechanisms underpinning diversity patterns in hard bottom communities (Benedetti-Cecchi, in press), differences in spatial variability patterns in intertidal versus subtidal communities (Konar et al. in press; Konar and Iken, in press), and the importance of rare species in regional diversity patterns (Benedetti-Cecchi et al. 2008). Regional products planned are, among others, a comparison of Arctic boulder field communities that are separated by only about 100 km but harbor distinctly different community structures (PS region), and a comparison of intertidal and subtidal rocky shore communities in the Gulf of Maine and Bay of Fundy (AO region). In addition, important legacies will be created on the regional scale. One of NaGISA’s goals is to identify hot spots in coastal biodiversity and initiate monitoring in such areas, ideally by involving coastal...
communities or other stakeholders. An increasing number of regions are already implementing long-term monitoring by including NaGISA protocols as part of governmental monitoring efforts (e.g. Monitoring 1000, WPAC) and in university class curricula (e.g., CS, EPAC, SAS, WPAC). Other governmental entities have expressed interest (e.g., DFO, Canada; MMS, USA) in supporting such long-term efforts and regional efforts are underway to pursue these options. Overall, NaGISA plans to identify and start about 25 long-term monitoring sites by 2010 (~3 per region) through governmental, university or community involvement, although some regions may be able to accomplish more sites than this (e.g. WPAC through the Japanese “Monitoring 1000” program, which includes 40 coastal sites). However, establishing community-based monitoring requires that relatively simple biodiversity attributes be identified that can be reliably implemented by non-scientists but at the same time can appropriately detect community patterns and change. NaGISA has now obtained the baseline data that will allow us to identify such attributes through statistical methods of taxonomic surrogacy (Benedetti-Cecchi, 2000; Konar and Iken, in press). Currently, we assume that these attributes may be region-specific but it will be interesting to see if common attributes may emerge over larger, or even global, scales.

2.3. Global NaGISA project synthesis products

Global coverage of nearshore communities is unique to NaGISA; other nearshore projects have either focused on smaller geographic areas or, if on a large scale, then on few taxa only. Hence, much of NaGISA’s final synthesis efforts will be devoted to integrating our data on the global scale. It is anticipated that this will allow us to identify, within the limits of our data coverage (see below), coastal diversity patterns and scales of variability along latitudinal, longitudinal and hemispherical gradients and across ocean basins. For this, the NaGISA team has identified a series of publications for a journal special issue, where such global patterns are first identified for
major taxa (macroalgae, polychaetes, decapods, gastropods, echinoderms, seagrasses) and then on the overall community level for rocky shore habitats (for further details see Appendix E). The special issue will also include a paper on global quantitative seagrass distributions for which NaGISA is the first to ever provide a dataset.

Obviously, the feasibility of these synthesis plans depends on data availability. NaGISA has currently sampled over 170 sites, several of these repeatedly. Recent compilation of data for the synthesis chapter on macroalgae (106 sites, Appendix B) shows that global coverage still is patchy concerning actual data availability from these collections because of incomplete sample identification (intertidal macroalgae data available for ~40 sites). Still, this coverage is sufficient to discern global trends of highest macroalgal diversity at high-temperate latitudes (Konar et al. 2008). This challenges the proposed view of highest intertidal diversity at lowest latitudes based on encrusting bryozoans (Witman et al., 2004; comparable coverage to NaGISA’s macroalgal data). NaGISA is the first approach ever to explore such trends for multiple taxa over the same global distribution and then on the overall community-level. This bears important and new scientific insights for our advancement of knowledge of global nearshore diversity patterns for various taxa, of how comparable trends are among taxa, and of how valid often-attempted generalizations of such single-taxon trends are for entire communities.

In addition to the scientific synthesis, the NaGISA group will also contribute products geared towards the public. The education and involvement of the next generation of scientists has been one aspect in which NaGISA has been particularly active. As a product of this proposal, NaGISA targets an even younger generation by creating a children’s book that conveys the wonders of biodiversity and the sense of global interconnectedness to children age 7-8. Aside from the traditional publishing venue, we also are exploring an online, self-publishing option.
2.4. Coastal biodiversity in the past, present and future

The benefit of being part of the Census of Marine Life is the opportunity to collaborate easily with other Census projects to go beyond the results that a single project can achieve. In 2006 NaGISA initiated collaboration with HMAP known as the History of the Near Shore (HNS) to more fully extend the temporal view of biodiversity along the ocean’s edge. For the synthesis phase, this collaboration has now been extended to use HNS data to identify the drivers (e.g. sea surface temperature, major weather disturbances, fishing pressure) that have shaped biodiversity patterns in the past 100+ years. This collaboration is complemented by a synthesis effort in partnership with FMAP to extend temporal coverage into the future by modeling current drivers of nearshore biodiversity. An understanding of current patterns of biodiversity, in conjunction with potential drivers such as nutrient regimes, sea surface temperature, human populations, human energy use, fishing pressure etc., will provide a prospect for modeling future scenarios of coastal diversity. For this NaGISA not only provides the present-day data but also delivers information about interannual variability from its repeatedly sampled sites, which allows us to differentiate between shorter- and longer-term changes. These cross-project collaborations are expected to produce novel results that we expect to have high impact in the scientific community while also being relevant for management and climate change response applications. Finally, after identifying past and future drivers, we will ultimately attempt to combine our results in a HMAP-NaGISA-FMAP collaboration to evaluate if and how the relative importance of drivers of biodiversity may have changed over time.

3. Project Milestones and Outcomes

After major restructuring of the NaGISA team following the passing of the previous program manager, the NaGISA team met in August 2008 to discuss and develop attainable synthesis goals.
As an outcome, we not only devised a productive new structure, but are also energized at having formulated milestones that build on the strengths and uniqueness of the NaGISA program. Following below, we present the major milestones, with further details given in the Synthesis Plan and Milestones appendices (Appendix D and G, respectively).

3.1. **By June 2009:** NaGISA will shift the focus of its activities to the production and completion of regional and global synthesis products. The February Long Beach Synthesis Workshop will be a focal point of synthesis activities and an opportunity for the NaGISA SSG to again meet face-to-face. By that time, a working draft of NaGISA’s McIntyre chapter will be produced. Manuscript drafts on global biodiversity patterns of selected taxa will be discussed and developed for inclusion in the NaGISA special issue. These manuscripts build on NaGISA data currently being prepared for upload into the database by Fall 2008. Preliminary text and illustrations for a children’s book are expected. NaGISA’s cross-projects with HMAP and FMAP will hold their initial workshops by spring 2009.

3.2. **By December 2009:** Final manuscripts for overall deliverables to CoML (e.g. McIntyre chapter) will be submitted, as well as the final product of the cross-project with FMAP. Manuscripts for the NaGISA special issue will be submitted to the issue editor to be sent out for peer-review. We anticipate that the children’s book will be in the hands of the publisher for printing. The HMAP-NaGISA cross-project will hold its final workshop and provide a draft of its final manuscript to CoML for inclusion in the Snelgrove synthesis book.

3.3. **By June 2010:** Most tangible products will be in the final phase of publication including the NaGISA special issue on global trends in biodiversity, the children’s book, and final products from the HMAP-NaGISA cross-project. The HMAP-NaGISA-FMAP project will have completed the overall analysis. Regional products will continue to be produced. To highlight
research and participants, NaGISA will host a special session at one or more scientific conferences in 2010. At this time more NaGISA sampling sites will have shifted towards long-term monitoring efforts.

3.4. By December 2010: NaGISA’s major findings and products up to that point will be published, including the overall CoML synthesis products, NaGISA’s special issue, the children’s book, and several regional biodiversity papers. NaGISA will join CoML in the London Grande Celebration.

3.5 Beyond 2010: Plans for continuing NaGISA beyond 2010 are being discussed among all NaGISA members. We will focus these efforts on long-term monitoring with community involvement and on hypothesis-driven research. NaGISA has successfully collected baseline data on a very large scale and will aim to establish long-term monitoring sites at identified biodiversity hot-spots. An excellent example for this is “Monitoring 1000” in Japan, a governmental monitoring project that adopted NaGISA protocols. Concerted lobbying efforts to achieve similar buy-in in other regions of the world include lobbying at major conferences and organizations (see Appendix B). Successful NaGISA promotion at high-level organizations, such as EPA, will need assistance from the CoML SSG or NRICs. Hypothesis-driven research can begin to test factors driving the biodiversity trends identified through the HMAP-NaGISA-FMAP collaboration. Based on these activities, we expect that the legacy of NaGISA and the infrastructure developed through it can continue for years past 2010.

4. Project Management

NaGISA organizational restructuring in 2008 after the loss of Project Manager Robin Rigby implements changes to facilitate communication and fortify program management. The previous four-tier strategy with Headquarters, Regional centers, Local researchers and Communities is
still employed, but with modifications in the uppermost tier. Project headquarters is now comprised of a Project Senior Advisor (Shirayama), two new Project Leads (Iken and Konar), and two Headquarters Managers, one based in Japan (Iseto) and one based in the US (Knowlton) (see NaGISA 2008 Annual Report for diagram). This restructuring was necessary to meet the increased communications and coordination needs during the final synthesis phase and to be proactive about seeking venues for NaGISA’s continuation after 2010. The second tier still includes the eight regional PIs who manage sampling and data collections in their geographic areas and who collaborate with local researchers (3rd tier) and local communities (4th tier).

5. Data Management

Data management has been problematic within NaGISA for a long time and implementation of a database has recently become highest priority within NaGISA. In collaboration with OBIS-Canada, NaGISA now has a functional database compatible with OBIS.

5.1. Internal data management and integration: While primary data management is at the regional level, the data manager at HQ (Iseto) can assist with this task. Each regional center is responsible for the collecting, recording, and validation of all data, as well as uploading them into the NaGISA database. Complete access to the quantitative data through the NaGISA database is essential for the success of the anticipated synthesis products and is of highest priority for us to achieve by December 2008.

5.2. OBIS interoperability: The NaGISA database was developed by OBIS-Canada and will thus be interoperable with OBIS. The data manager is currently working on establishing a functional link or interface between the NaGISA and OBIS databases that will allow straightforward and easy upload of data into OBIS for the diverse, global network of NaGISA researchers. The importance of data availability through OBIS will be stressed to all NaGISA participants and
assistance or training provided where necessary through the data manager. All regional data are
currently being uploaded into the OBIS database (~19,000 species presence data entries into
OBIS as of October 2008). Data will continue to be added to OBIS as they are made available in
the NaGISA database.

5.3. Long-term database maintenance: NaGISA currently has a contract with OBIS-Canada to
maintain its database through March 2010. An agreement to extend the maintenance contract to
beyond 2010 will be negotiated by March 2009. NaGISA envisions utilizing its database as a
repository for data from other nearshore researchers and agencies and is currently seeking
partnerships (e.g., AKEMAP, PISCO, etc). After regional and global scientific publications have
been produced, NaGISA intends to open its quantitative database to the public.

6. Synthesis

Based on its plans, NaGISA is looking forward to the CoML Synthesis Phase with excitement.

We anticipate that the largest impacts of this monumental program will be felt through the
synthesis products. NaGISA is committed to completing its own synthesis plans as well as
contributing to as many CoML synthesis projects as possible.

Table 1. Specific synthesis responsibilities of NaGISA personnel.

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<thead>
<tr>
<th>Name</th>
<th>Contact</th>
<th>Responsibilities</th>
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<tbody>
<tr>
<td>Ann Knowlton, University of Alaska Fairbanks, USA</td>
<td><a href="mailto:knowlton@sfos.uaf.edu">knowlton@sfos.uaf.edu</a></td>
<td>Synthesis coordination; M&amp;V liaison; E&amp;O coordinator</td>
</tr>
<tr>
<td>Yoshihisa Shirayama, Seto Marine Biological Laboratory, Kyoto University, Japan</td>
<td><a href="mailto:meiobenthos2007@yahoo.co.jp">meiobenthos2007@yahoo.co.jp</a></td>
<td>WPAC region contributions to McIntyre Chapter; lead author ‘Introduction’ for NaGISA special issue</td>
</tr>
<tr>
<td>Brenda Konar, University of Alaska Fairbanks, USA</td>
<td><a href="mailto:bkonar@guru.uaf.edu">bkonar@guru.uaf.edu</a></td>
<td>EPAC region contributions and lead writer for McIntyre Chapter; lead author ‘Macroalgae’ and co-author ‘Echinoderm’ papers for NaGISA special issue; NRIC contributions</td>
</tr>
<tr>
<td>Katrin Iken, University of Alaska Fairbanks, USA</td>
<td><a href="mailto:iken@ims.uaf.edu">iken@ims.uaf.edu</a></td>
<td>PS region contributions to McIntyre Chapter; co-author ‘Echinoderm’ paper for NaGISA special issue; contributor children’s book; NRIC contributions</td>
</tr>
<tr>
<td>Name</td>
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<td>Responsibilities</td>
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<tr>
<td>Patricia Miloslavich, Universidad Simón Bolívar, Venezuela</td>
<td><a href="mailto:pmilos@usb.ve">pmilos@usb.ve</a></td>
<td>SAS region contributions to McIntyre Chapter; editor NaGISA special issue, co-author ‘Conclusions’ and ‘Mollusk’ papers for NaGISA special issue; NRIC contributions</td>
</tr>
<tr>
<td>JJ Cruz, Universidad Simón Bolívar, Venezuela</td>
<td><a href="mailto:juancruz@usb.ve">juancruz@usb.ve</a></td>
<td>CS region contributions to McIntyre Chapter; lead author ‘Rocky Community’ paper for NaGISA special issue; NRIC contributions</td>
</tr>
<tr>
<td>Gerhard Pohle, Huntsman Marine Science Center, Canada</td>
<td><a href="mailto:gpohle@huntsmanmarine.ca">gpohle@huntsmanmarine.ca</a></td>
<td>AO region contributions to McIntyre Chapter; lead author ‘Decapod’ paper for NaGISA special issue</td>
</tr>
<tr>
<td>Lisandro Benedetti-Cecchi, University of Pisa, Italy</td>
<td><a href="mailto:lbenedetti@biologia.unipi.it">lbenedetti@biologia.unipi.it</a></td>
<td>ES region contributions to McIntyre Chapter; lead author ‘Polychaete’ paper for NaGISA special issue; co-lead for FMAP-NaGISA cross-project</td>
</tr>
<tr>
<td>Edward Kimani, Kenya Marine and Fisheries Research Institute, Kenya</td>
<td><a href="mailto:ekimani@kmfri.co.ke">ekimani@kmfri.co.ke</a></td>
<td>IO region contributions to McIntyre Chapter; arrange author for ‘Seagrass’ paper for NaGISA special issue</td>
</tr>
<tr>
<td>Tom Trott, Suffolk University, USA</td>
<td><a href="mailto:codfish2@earthlink.net">codfish2@earthlink.net</a></td>
<td>Lead PI HMAP-NaGISA cross-project synthesis; lead author ‘Conclusions’ for NaGISA special issue; lead writer children’s book; contribute to McIntyre chapter</td>
</tr>
<tr>
<td>Tohru Iseto, Seto Marine Biological Laboratory, Kyoto University, Japan</td>
<td><a href="mailto:tohru_iseto@hotmail.com">tohru_iseto@hotmail.com</a></td>
<td>Database, website, and financial management</td>
</tr>
</tbody>
</table>

6.1. People and their Synthesis responsibilities: Overall synthesis efforts will be coordinated by Ann Knowlton, HQ Program Manager, with regional PIs taking the lead on individual synthesis products including overall deliverables to CoML. Each region will contribute relevant data and expertise to the NaGISA synthesis products as outlined in Table 1.

6.2. Building the picture of biodiversity within NaGISA: A more comprehensive understanding of biodiversity patterns and drivers in the nearshore will result from the completion of several global synthesis products, both within NaGISA and as part of CoML’s overall synthesis volumes.

6.2.1. NaGISA special issue: A major scientific outcome of NaGISA will be the publication of a special issue in *PLoS-ONE* in 2010 on global patterns of biodiversity for selected taxa (macroalgae, polychaetes, decapods, echinoderms, gastropods, seagrasses), and nearshore hard
substrate community and seagrass assemblages (also see section 2.3). Lead authors for each paper, issue editor, and a completion timeline have been determined (Appendix E).

6.2.2. Snelgrove synthesis book: NaGISA’s primary contribution to the Snelgrove book will most appropriately center on Chapter 4: Around the Ocean Rim. NaGISA’s global coverage of the nearshore environment can add much about large-scale biodiversity patterns and its drivers. NaGISA also can contribute to other chapters such as Chapter 2: A Riot of Species, having discovered several new species as well as regularly sampling thousands of nearshore species; Chapter 5: At the Ends of the Earth with NaGISA’s Polar Seas region; Chapter 9: Failing Ocean, with results from NaGISA’s past-present-future cross-project products; and Chapter 10: Beyond 2010, incorporating the questions remaining unanswered and the new questions that have arisen as a result of NaGISA’s research.

6.2.3. McIntyre project synthesis publication: Brenda Konar is the lead writer for this chapter and will combine contributions from all eight NaGISA regions into a cohesive product. An outline of the content of NaGISA’s McIntyre chapter can be found in our Synthesis Plan (Appendix D). The final product will be delivered to CoML by the December 2009 deadline.

6.2.4. Special Sessions at scientific conferences: NaGISA aims to broadly share its results with the scientific community through special sessions at one or more scientific conferences in 2010. NaGISA will also use this opportunity to encourage collaboration among nearshore researchers. Currently we are targeting the Benthic Ecology Meeting, the Ecological Society of America Meeting, the Temperate Reef Symposium, the Western Society of Naturalists Symposium, and/or the Intertidal Biodiversity Meeting in Hong Kong.

6.3. National & Regional Implementation Committees (NRIC) synthesis product: NaGISA could contribute information to nearly all of the NRIC articles since nearshore sampling has occurred
on a global scale. At this time, contributions are specifically planned to the Caribbean, South American and US NRIs. NaGISA regional PIs are establishing contact with the NRIC leaders of their regions to offer collaboration in the NRIC articles.

6.4. Other NaGISA outputs and scientific communications activities: Other regional scientific outputs from NaGISA will primarily be in the form of scientific papers published in peer-reviewed journals. Each region has been and will continue to produce several papers over the ensuing years (see Appendix D for details).

6.5. Cross-project synthesis activities: NaGISA has integrated two major cross-project collaborations into its synthesis plans. The collaborative HNS program has set the stage for a HMAP-NaGISA cross-project synthesis to identify changes in diversity over the past 100+ years and to identify possible drivers of these changes. Collaboration with FMAP has also been established to model drivers of biodiversity in the nearshore. After each cross-project has completed its individual product, an overall past-present-future synthesis will be developed by all three projects. NaGISA is looking forward to contributing also to other appropriate cross-projects as they are being developed by the Synthesis Committee (e.g. fresh estimates of biomass by trophic and/or species levels in all realms).

6.6. Mapping & Visualization: The global scale of NaGISA makes M&V an important visualization tool, especially in displaying overarching results to the broader public. A major interest and need for NaGISA during the synthesis phase is to develop interactive maps of coastal biodiversity. NaGISA will participate in the October 2008 M&V workshop (Ann Knowlton, NaGISA E&O liaison) and contribute products for the CoML website. These products will likely include, but are not limited to, GIS maps of global diversity patterns of key nearshore taxonomic groups and communities overlaid with habitat information. Such maps can be expanded to include temporal trends derived from the HMAP-NaGISA-FMAP syntheses, as
well as other published global information (e.g. Valentine and Moores, 1974; Witman et al., 2004). An interactive 3D map/globe can be envisioned where a user can click on a specific location to zoom in from a coastal region overview all the way down to an individual sampling quadrat and key organisms. Maps that show species ranges with links to Encyclopedia of Life and Algaebase species entries, and genus-level phylogenetic tree maps are also of interest.

NaGISA is also participating in the creation of several short animations on ocean biodiversity and processes at work in the ocean. Ann Knowlton will be in charge of M&V developments and also is a member of the CoML group developing animation ideas and writing a proposal for their creation.

6.7. CoML Grande Celebration October 2010: NaGISA is eager to take part in CoML’s Grande Celebration in 2010. The NaGISA special issue in *PLoS-ONE* on global trends in nearshore biodiversity will be our major scientific highlight at the meeting. Additionally, the cross-project products with HMAP and FMAP will provide intriguing insights to temporal changes along our ocean’s coasts. Each region will have their own scientific highlights in the form of published papers. An aspect unique of the NaGISA project to be highlighted is its strong outreach efforts to involve, educate, and empower young scientists and local communities in coastal issues. Through a children’s book we will show our youngest generation the beauty and diversity of our ocean’s shorelines. Another unique aspect of NaGISA is the establishment of long-term monitoring sites, which we plan to highlight at the meeting. Many of these sites are maintained with the assistance of communities and young scientists. We anticipate all of our regional PIs and Headquarters personnel will attend the London meeting and have budgeted appropriately.

7. Education and Outreach

Education and outreach are vital parts of NaGISA’s mission and are managed by our E&O
coordinator, Ann Knowlton. Outreach activities cover public presentations and media coverage, hands-on involvement of local communities in NaGISA field work, training of students, and training of local researchers in countries where scientific knowledge and training is less developed. All regions are actively involved in education and outreach.

7.1. Recent E&O examples: NaGISA conducts E&O activities on a regular basis within regional centers (see Table 2 for summary). Some of the recent activities that have occurred include the involvement of teachers in field crews. In the Atlantic Ocean Region, two school teachers (Michael Head, Pattie DeMario) participated in the field activities at two sites (USA and Canada), with DeMario producing a web-blog that has a strong outreach component (e.g. used in curriculum of Saco Middle School, Maine). Taxonomic and protocol workshops to educate and engage researchers from less developed countries are a hallmark of the WPAC Region. For example, a NaGISA protocol workshop in March 2008 in Malaysia involved 23 participants from three countries conducting sampling at Pulau Bassar using the NaGISA protocol. This experience encouraged each of the participants to plan a sampling trip in their own region. At the university level, the NaGISA protocol continues to be part of the undergraduate Marine Biology course at Universidad Simón Bolivar, Venezuela. While these data are currently not included in the NaGISA database due to rigorous data quality assessment and control, they have been

Table 2. Summary of NaGISA’s primary E&O activities.

<table>
<thead>
<tr>
<th>Type of Activity</th>
<th># Occurrences</th>
<th>Participation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regional sampling and/or taxonomic workshops</td>
<td>30</td>
<td>&gt;600 researchers and community members from more than 25 countries</td>
</tr>
<tr>
<td>University courses incorporating NaGISA protocols into curriculum</td>
<td>7</td>
<td>&gt;200 undergraduate and graduate students; most courses taught regularly</td>
</tr>
<tr>
<td>University theses using NaGISA protocols for methodology</td>
<td>2 completed  4 in progress</td>
<td>Includes undergraduate theses where multiple students may collaborate</td>
</tr>
<tr>
<td>K-12 classes incorporating NaGISA activities into curriculum</td>
<td>11 (2+ in planning)</td>
<td>Reaching over 400 students; several classes have multiple years of including NaGISA</td>
</tr>
<tr>
<td>Academic guidance meetings for high school students</td>
<td>2</td>
<td>&gt;1000 students informed of degree courses and research activities including NaGISA</td>
</tr>
</tbody>
</table>
presented at scientific meetings in the last 2 years as well as been part of a paper in a local peer-reviewed journal. Other, supervised sampling involving university students (e.g. EPAC region) yields data that meet NaGISA QA/QC standards and are incorporated into the database.

7.2. Planned E&O outputs: NaGISA will continue its regional E&O efforts such as classroom visits to K-12 schools, participation in academic guidance meetings for pre-university students that highlight degree courses and research activities including NaGISA, incorporation of NaGISA protocols and biodiversity topics in university courses, and interactions with coastal communities. One goal for 2010 and beyond is to establish community-based monitoring utilizing simplified key criteria. It is part of our synthesis plan to identify such simple community attributes (see section 2.2 above). Specific E&O outputs by 2010 are a children’s book exploring the biodiversity around the world and an outstanding field guide of nearshore species in Chilean fjords. NaGISA will be highlighted in three video documentaries (CBC TV special on the state of the oceans in Canada, a Venezuelan production on NaGISA activities in the Caribbean and along the shores of South America, and a segment in the CoML feature program by videographer Richard Morris) and will collaborate on two museum exhibits (rocky shores of Venezuela with the Museum of Natural Science, and an ongoing exhibit at the Kyoto University Aquarium). Continued expansion of the NaGISA high school initiative will be fostered, with plans for involvement of students in NaGISA sampling activities in Zanzibar (fall 2008) and Crete (spring 2009). Additionally, a team from Niceville High School in Florida has been invited to do a NaGISA presentation to a high school in San Salvador, as well as at the 2009 National Ocean Science Bowl in Washington, DC. NaGISA will also support and contribute to CoML E&O efforts, including the development of short animations for CoML and project websites and/or for classroom presentations.
7.3. Website: NaGISA is in the process of updating its website (http://www.nagisa.coml.org/) and providing more interactive content, with the guidance of the Mapping & Visualization team. We intend our website to be educational, informative, and easy to navigate. HQ web manager Tohru Iseto will ensure that our website stays current. The website is currently hosted on a server linked through Kyoto University in Japan. NaGISA will purchase a server specifically for the website, where it can be hosted and maintained beyond 2010.

8. Legacies and Partnerships

8.1. Contribution to CoML legacies: Following, we provide an overview of NaGISA’s main legacies and how they will be implemented:

- **New views on how and why biodiversity varies on latitudinal, longitudinal, and temporal scales**
  Implementation through the production of scientific publications (including new taxonomic descriptions/revisions) and maps displaying global diversity patterns, the established network of nearshore researchers, the use of standardized protocols to increase global coverage, and the availability of a continually enhanced database as a repository for global nearshore biodiversity data.

- **Provide marine resource managers with information and methodology to implement long-term monitoring and to improve conservation and management practices**
  Implementation through the availability of a publicly accessible database, establishment of NaGISA long-term monitoring sites, development of simple nearshore community attributes that can be used for simplified community-based monitoring, contribution to other accessible online resources such as EoL and MarBOL, and the publication of field guides.

- **Public education about nearshore biodiversity**
Implementation through development of community-based monitoring, integration of protocol-based monitoring within university and high school course curricula, publication of field guides, and provision of information via the NaGISA website.

8.2. Contribution to Encyclopedia of Life (EoL), Marine Barcode of Life (MarBOL): NaGISA has sampled thousands of species in the nearshore and intends to contribute to many EoL species pages once EoL had provided specific guidelines. NaGISA has developed a plan with MarBOL to provide tissue samples of four taxa of interest (crustaceans, polychaetes, mollusks, and echinoderms) based on current MarBOL primer sets and a pilot collection program is underway in Alaska and will soon be expanded into other regions.

8.3. Applications: Primary users of NaGISA’s findings will be other nearshore researchers and resource managers (e.g. DFO, Canada; MMS, USA). Dissemination of the information will be through peer-reviewed publications, scientific meeting presentations, as well as access to NaGISA’s quantitative database after 2010. Partnerships and collaborations with other research groups and agencies are ongoing with the intent of NaGISA’s name and database becoming a portal and repository for nearshore data for scientists and the broader public.

8.4. Capacity building: Due to its inherent nature of studying the most accessible region of the ocean and its involvement with local communities and schools, NaGISA has a strong capacity-building component. NaGISA’s sampling and taxonomic education has included many less-developed regions and countries (see Table 2). NaGISA also has a strong presence in the university setting with sampling protocols being incorporated in course curricula and used as methodology for undergraduate and graduate theses. In addition, the NaGISA high school network is thriving and becoming self-perpetuating. Four high schools in Florida are using NaGISA protocols as a teaching and research tool.
### Appendix A: NaGISA 2009-2010 Budget Request and Justification

#### A1. Budget Request

Following is the NaGISA renewal budget request for 2009-2010, funding amounts given in US$

<table>
<thead>
<tr>
<th>Budget item</th>
<th>2009</th>
<th>2010</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>HQ support</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HQ-Japan manager salary (Tohru Iseto)(^{Jp})</td>
<td>55,000</td>
<td>55,000</td>
<td>110,000</td>
</tr>
<tr>
<td>HQ-Alaska manager salary (Ann Knowlton)</td>
<td>67,000</td>
<td>70,000</td>
<td>137,000</td>
</tr>
<tr>
<td>HQ administrative support (^{Jp})</td>
<td>12,000</td>
<td>9,065</td>
<td>23,000</td>
</tr>
<tr>
<td><strong>Synthesis products</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Special issue (PLoS ONE)</td>
<td></td>
<td>20,000</td>
<td>20,000</td>
</tr>
<tr>
<td>Chilean Fjord guide</td>
<td>22,000</td>
<td></td>
<td>22,000</td>
</tr>
<tr>
<td>Children’s book</td>
<td>25,000</td>
<td></td>
<td>25,000</td>
</tr>
<tr>
<td>HMAP-NaGISA synthesis (workshops)</td>
<td>50,000</td>
<td></td>
<td>50,000</td>
</tr>
<tr>
<td>FMAP-NaGISA synthesis (workshops)</td>
<td>35,000</td>
<td></td>
<td>35,000</td>
</tr>
<tr>
<td>HMAP-NaGISA-FMAP synthesis (workshop)</td>
<td>15,000</td>
<td></td>
<td>15,000</td>
</tr>
<tr>
<td>Regional support (see details below)</td>
<td>152,000</td>
<td>152,000</td>
<td>304,000</td>
</tr>
<tr>
<td>HNS obligations (project completion)</td>
<td>23,500</td>
<td></td>
<td>23,500</td>
</tr>
<tr>
<td><strong>Travel</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PI-travel to Synthesis workshop, Long Beach (Feb 2009), includes NaGISA-SSG meeting</td>
<td>40,000</td>
<td></td>
<td>40,000</td>
</tr>
<tr>
<td>PI-travel to Grande Celebration, London (Oct 2010), includes NaGISA-SSG meeting</td>
<td></td>
<td>45,000</td>
<td>45,000</td>
</tr>
<tr>
<td>HQ manager travel support for networking (^{Jp})</td>
<td>9,000</td>
<td>9,000</td>
<td>18,000</td>
</tr>
<tr>
<td><strong>Data management</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Database support through OBIS</td>
<td></td>
<td>4,000</td>
<td></td>
</tr>
<tr>
<td><strong>Sub-total</strong></td>
<td>490,500</td>
<td>379,065</td>
<td>869,565</td>
</tr>
<tr>
<td><strong>15% Overhead</strong></td>
<td>73,525</td>
<td>56,860</td>
<td>130,435</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>564,075</td>
<td>435,925</td>
<td>1,000,000</td>
</tr>
</tbody>
</table>

**Subcontracts within total budget**

| Subcontract to Kyoto University, Japan           | 84,500| 83,000| 167,500|
| Subcontract to Pisa University, Italy            | 19,000| 19,000| 38,000 |
| Subcontract to Huntsman Marine Science Center, Canada | 28,000| 28,000| 56,000 |
| Subcontract to University Simon Bolivar, Venezuela | 38,000| 38,000| 76,000 |
| Subcontract to Marine Fisheries Center, Kenya    | 19,000| 19,000| 38,000 |

**12% overhead on subcontracts (except Venezuela)**\(^*\)

| Subcontract to Kyoto University, Japan           | 18,060| 17,880| 35,940 |

**Total subcontract amount**

|                | 206,560| 204,880| 411,440 |

\(^{Jp}\) indicates that budget item is included in the subcontract to Japan

\(^{Jp}\) indicates that part of the budget item is included into the subcontract to Japan

\(^*\) Universidad Simon Bolivar, Venezuela does not request overhead
A2. Budget Justification

This proposal to the Alfred P. Sloan Foundation requests continuing support for the NaGISA project for January 1, 2009 – December 31, 2010 (24-month duration). Funds are specifically requested for the administration of HQ and the eight regional centers, and to facilitate the production of synthesis publications including two cross-project initiatives (an HMAP-NaGISA project, and an FMAP-NaGISA project).

We ask that the grant be administered through the University of Alaska Fairbanks (UAF) under the supervision of co-NaGISA project leaders Katrin Iken and Brenda Konar. Funds for Headquarters (HQ)-Alaska, EPAC and PS regional centers, the two cross-project synthesis initiatives, other synthesis product costs (PLoS-ONE special issue, field guide, children’s book), and NaGISA SSG meeting costs (Long Beach meeting February 2009 and London Grande Celebration meeting October 2010), and funds for OBIS database maintenance (totaling $503,978) will remain at UAF. 15% UAF overhead ($ 75,597) will be charged to that portion of the grant. The remaining funds ($411,440) will be subawarded to regional NaGISA collaborators including 12% overhead, except for Universidad Simon Bolivar Venezuela, which does not require overhead: Caribbean Seas and South American Seas at the University Simon Bolivar, Venezuela ($76,000); Indian Ocean at the Marine Fisheries Center, Kenya ($42,560); WestPac and HQ-Japan at Kyoto University, Japan ($187,600); Atlantic Ocean at Huntsman Marine Science Center in Canada ($62,720); European Seas at University of Pisa, Italy ($42,560). A 3% overhead charge (total $8,985) on these subcontracts will remain at UAF to facilitate administration of awards, in agreement with Sloan Foundation budget guidelines. No double overhead will be charged between UAF and the receiving institution.

A2.1 Salary Costs:
We request funds to support two full-time HQ managers to oversee the project, one based at University of Alaska Fairbanks and one at Kyoto University. The project managers will split project responsibilities to better address the increased needs of coordination and communication during the synthesis phase. Other salary costs occur in the regional centers (included in subawards to regional centers) to support a regional manager to assist with data needs for the synthesis products and taxonomic identification of existing samples.

A2.2 Meeting Costs:
Annual SSG meetings are essential for the success of NaGISA’s synthesis phase. To save costs and take advantage of a planned synthesis workshop, the 2009 NaGISA SSG meeting will be held during the Long Beach Synthesis Workshop in February 2009. All regional PIs are directly involved in NaGISA’s contributions to overall Census products (e.g. McIntyre and Snelgrove synthesis books), as well as NaGISA’s global diversity of the nearshore special issue. Long Beach provides an ideal venue to focus on completing NaGISA synthesis tasks while also interacting with other Census groups for the broader scope of the synthesis. For additional SSG meetings, NaGISA will take advantage of its members presenting at many of the same scientific conferences. NaGISA will continue quarterly conference calls with all SSG members that were started in September 2008. Regular direct communication will maintain the renewed cohesion of NaGISA. Costs to cover conference calls are requested in HQ administrative support. All HQ and regional PIs are planning on attending CoML’s London Grande Celebration in October 2010.
to celebrate the success of the first Census of Marine Life, highlight project results, and continue making plans for NaGISA’s future. Funds to cover the cost of these meetings during the proposal period are requested as they are directly associated with administration and project maintenance. Travel funding for the two HQ managers is requested to cover costs to attend additional meetings (CoML or scientific) during the synthesis phase to ensure that NaGISA is well-connected, database workshops with OBIS, or attendance of cross-project synthesis workshops. Other travel may be associated with efforts to lobby for continued NaGISA activities beyond 2010 and the establishment of long-term monitoring sites.

A2.3 Cross-Projects:
NaGISA requests funding for two major cross-project syntheses (HMAP-NaGISA and FMAP-NaGISA), as recommended by the Synthesis Group based on the LoI’s submitted for the synthesis call. These cross-project syntheses will be accomplished during several workshops for which travel funds are requested. In addition, NaGISA will work with FMAP and HMAP in a 3-way collaboration to synthesize past, present and future drivers of nearshore biodiversity. NaGISA requested (and was granted) permission from Jesse Ausubel to add the costs of these cross-projects in its renewal proposal to the Sloan Foundation. Included in the cross-project costs also are outstanding project funds for two HNS projects. Previously available funds for these projects were deferred to the NaGISA SSG meeting in Venezuela in August 2008, which was essential to reorganize NaGISA and develop the synthesis plan.

A2.4 Synthesis Products:
Funds are requested to cover publication costs of NaGISA’s synthesis products. These products include a special issue in *PLoS-ONE* (proposal to *PLoS-ONE* was approved) on global biodiversity patterns of selected taxa (see details in Appendix E). NaGISA will also be part of a high-profile field guide of marine invertebrates of Chilean fjords. In addition, NaGISA will be producing a children’s book targeted at 7-8 year olds that will invite them to explore the diverse and unique organisms and habitats along the shores of the world’s ocean. Regional support through subcontracts will fund regional synthesis products like publications, animation videos, museum exhibits, etc.

A2.5 Administrative costs:
Administrative support for HQ includes quarterly international conference calls (see “Meetings” above), data servers, computer and printers, etc. Fees to OBIS for maintenance of the NaGISA database are requested for the second year; fees for 2009 maintenance were already paid.
Appendix B: Current NaGISA Status Compared to Sloan Foundation’s Expectations

Here we provide a comparison of previously formulated expectations and metrics of the Sloan Foundation for the NaGISA program. As always in large, dynamic projects, some focus areas have changed and not all metrics may be achieved as outlined before. NaGISA would like to provide an honest self-assessment of which expectations are on track, where and how directions have changed, and how NaGISA sees itself able to accomplish the major goals in the next 2 years.

1. Conduct transects at 300 sites by end of 2009, be on track for 420 in 2010, and successfully archive data in OBIS

In the table below we provide our currently active sampling sites by region, as well as new sites due to be sampled. We have abandoned the 20° bin concept used in previous estimates as we are unable to determine how Robin Rigby originally designated the bins and which bins were removed from consideration. Compared to previous expectations, NaGISA has fallen short of the anticipated number of sampling sites, and we do not expect to reach 300 or 420 sites by the end of 2009 and 2010, respectively. Site coverage will increase within the next two years but will likely not exceed ~200 by the end of 2010. Reasons for this are that several regions came on late during NaGISA’s life and will have to focus on synthesis rather than geographical expansion shortly after their initiation. In addition, the massive work associated with taxonomic identifications of samples makes it unfeasible to collect more. Therefore, NaGISA will focus on working up samples rather than new collections so that data are available for synthesis. Also, NaGISA in some cases devoted effort to the re-sampling of sites instead of sampling new sites, which is important for our questions and cross-project syntheses with HMAP and FMAP. Still, NaGISA does have a widely distributed set of active sites with relatively few major longitudinal and latitudinal gaps. Geographically, there are currently sampling gaps in the Indian Ocean, around Australia, and in portions of South America and western Africa. NaGISA also has some intensely sampled geographic regions (e.g. Venezuela, Alaska).

<table>
<thead>
<tr>
<th>Region</th>
<th>Number of Sites Sampled</th>
<th>Number of Collections*</th>
<th>Number of Sites in Planning</th>
<th>Macroalgal Sites</th>
<th>Seagrass Sites</th>
<th>Other Sites**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atlantic Ocean (AO)</td>
<td>12</td>
<td>14</td>
<td>0</td>
<td>4</td>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td>Caribbean Sea (CS)</td>
<td>10</td>
<td>14</td>
<td>0</td>
<td>6</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Eastern Pacific (EPAC)</td>
<td>26</td>
<td>57</td>
<td>0</td>
<td>21</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>European Seas (ES)</td>
<td>8</td>
<td>9</td>
<td>1</td>
<td>7</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Indian Ocean (IO)</td>
<td>6</td>
<td>10</td>
<td>1</td>
<td>4</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Polar Seas (PS)</td>
<td>14</td>
<td>31</td>
<td>5</td>
<td>14</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>South American Seas (SAS)</td>
<td>71</td>
<td>91</td>
<td>0</td>
<td>39</td>
<td>32</td>
<td>0</td>
</tr>
<tr>
<td>Western Pacific (WPAC)</td>
<td>25</td>
<td>25</td>
<td>0</td>
<td>11</td>
<td>14</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>172</td>
<td>251</td>
<td>7</td>
<td>106</td>
<td>63</td>
<td>3</td>
</tr>
</tbody>
</table>

*total number of sample collections from active sites, includes resampling

**includes rhodolith beds, mudflats, and sandy beaches

The most important metric is whether NaGISA can answer its scientific questions with the available data set. For these, sampling coverage is sufficient and exceeding that of previous global nearshore biodiversity assessments (e.g. Witman et al., 2004). The key obstacle to NaGISA’s successful evaluation of global patterns is that many sampled sites have not been fully worked up taxonomically and quantitatively (abundance and biomass). Much of the regional support in this renewal proposal is devoted to taxonomy but this still is the area of most significant financial shortage that we experience in most regions, and any assistance by the CoML SSG to identify new funding sources is much appreciated and needed.
In spite of the geographical gaps, NaGISA will be able to make important global comparisons of biodiversity trends, as outlined in the proposal (see section 2.3). For temporal resolution, enough repeated sampling has occurred at select sites to discern inter-annual variations in biodiversity on a regional scale. This is important information so it can be differentiated from long-term variations due to changing global conditions which will be analyzed in collaboration with HMAP.

With regards to OBIS, NaGISA has contributed 18,849 records already and will continue to provide data to OBIS. In a recent conversation with Jesse Ausubel, NaGISA has gained a better understanding of what CoML and Sloan wants in regards to OBIS with not only data submission, but also increasing its usage, and providing information to make the database easier to access and navigate by any potential user. NaGISA will encourage its participants and partners to use OBIS and to provide feedback on their experience using it. If there is sufficient interest, NaGISA will request and assist in the development of a NaGISA-specific user interface to facilitate OBIS’ use by the NaGISA community.

2. Publish papers in leading journals with findings, e.g., re new species or patterns, to merit broader media attention (press releases, coverage)

This metric is met with publications on the identification of new species and patterns of biodiversity in leading journals, with many more anticipated as synthesis products progress. Some of the highlight publications are mentioned in the proposal and a complete list can be accessed in the CoML Bibliography database (~139 entries). NaGISA has not had much recent broad media coverage, partly due to the mundane, yet critical, task of sorting through the enormous quantity of samples that have been collected. In addition, many of NaGISA’s events or findings are more locally important and highlighted. When major findings occur, NaGISA will procure a broad media coverage as it has done for past findings (e.g. discovery of new rhodolith beds in Alaska with international media coverage in >20 countries).

3. Win additional needed global commitments (estimated to be about $10 m between Jan 2007-Dec 2010) to carry out the sampling and analysis strategy by 2010

Overall, funding for NaGISA activities is barely adequate. Support from the Sloan Foundation is primarily used for maintaining NaGISA’s administrative structure and synthesis products. This support is adequate. There is a significant lack of funds for sufficient progress in the area of taxonomic identification of samples, where additional financial support is much needed. In nearly all regions we still have unsorted and unidentified samples that may be lost for synthesis if additional sources of funds cannot be raised. Financial support remains the single greatest obstacle to changing this issue. The financial needs among NaGISA regional centers vary based on current partnerships established. Current (does not include past) external funding amounts to approximately $1 million with major contributions from the Nippon Foundation (Japan), Chevron (Venezuela), and the Department of Fisheries and Oceans (Canada). NaGISA will continue to solicit additional commitments and welcomes suggestions for other possible sources by the CoML SSG.
4. Win commitments from many countries for commitment to Legacy, i.e., maintaining NaGISA sites for long-term ecological monitoring (e.g. to 2050)

NaGISA has developed commitments within several countries for long-term monitoring of sites with governmental entities (e.g. Monitoring 1000 (Japan), Department of Fisheries and Ocean (Canada), Environmental Monitoring and Assessment Program (USA)) or as part of university courses. NaGISA recognizes the importance of local, national and global lobbying for the implementation of long-term monitoring. Currently, NaGISA’s leadership is exploring several options, but would benefit from additional support and advice from the CoML leadership. Discussions are underway for collaborations with PISCES, which could strengthen government commitment especially in the WestPac region. We also had past success in collaborating with NGOs and are seeking more contact in the future (e.g., Nature Conservancy). Shira is also exploring options to add coastal monitoring to monitoring activities related to ocean acidification through his position as a task force member of the Pacific Science Association. More venues and concerted efforts will be discussed during a NaGISA mini-leadership meeting during the MARBEF meeting in Valencia. NaGISA also is interested in maintaining its capacity-building legacy and is working on establishing closer relations with the Global Taxonomy Initiative (GTI).

5. Manage the international program in a way that sticks to schedule, continues to attract partners, and minimizes friction or disputes

In 2008 NaGISA reorganized its leadership structure within International Headquarters as well as increased its personnel to better handle the increased need for communication and coordination as we enter the synthesis phase of CoML. New co-Project Leaders Katrin Iken and Brenda Konar manage day-to-day needs and decisions while Shira provides guidance and long-term vision as Senior Advisor. Two HQ project managers have been hired to coordinate synthesis activities and project needs. Tohru Iseto (Japan) maintains NaGISA’s database and website. Ann Knowlton (USA) is the lead synthesis coordinator, E&O liaison, communications officer, and M&V liaison. Since the SSG meeting in Venezuela (August 2008) communications have been very open regarding issues within NaGISA and an atmosphere where constructive criticism is welcomed has developed. All of these changes have created a much stronger cohesion and commitment within NaGISA and will contribute to the publication of quality synthesis products. The change in the NaGISA group spirit can maybe be best described as:

“There is a difference between merely having a goal and being committed to a huge, daunting challenge” (Robert Grant, 2005)

6. By early 2009, share clear picture with SSC of what can be learned by 2010 and have plan in place for integration

NaGISA has completed this goal with the development of a clearly defined synthesis plan. The highlights to be especially shared with the CoML community include a series of global biodiversity papers on selected taxa and on ecosystem types. As we have explained elsewhere in the proposal, these will be valuable and new scientific contributions because they will be the first to address questions as outlined in section 1.2 of the proposal for multiple taxa as well as communities on a global scale. NaGISA will address a critical shortcoming of our current scientific knowledge as any previous study attempted to make community-wide inferences from single-taxon patterns. We cannot yet predict if common community patterns will be discernable or if in fact patterns are mainly taxon-specific, but we will know by 2010. We expect NaGISA to also make significant contributions to the validity of taxonomic surrogacy in nearshore biodiversity. This is a highly-debated issue and in NaGISA’s efforts to identify simple community attributes that can be used reliably in community-based monitoring we can add extremely valuable information for the scientific community.

One possible shortcoming of NaGISA are the gaps in geographical coverage, as explained above. A more continuous coverage would certainly be better. However, knowing the reality of effort involved in solid sampling, the ideal tightly-spaced and continuous spatial coverage, including temporal replication of nearshore communities, may still be part of the unknowable for a very long time.
Appendix C: NaGISA References

A complete list of NaGISA references entered in the CoML Bibliographic Database can be found on the NaGISA website (http://www.nagisa.coml.org/). This list is updated on a regular basis as new publications are released.

References Cited in Proposal:


I. Context and questions

NaGISA is a habitat-specific, quantitative survey of the world’s ocean shores, consisting of a series of well-distributed standard transects from the high intertidal zone to a depth of 20m. NaGISA creates a baseline from which monitoring of sites can move forward, and stakeholders can become engaged.

NaGISA’s Overarching Goals

- To create the first global baseline of coastal biodiversity in rocky shores and seagrass beds
- To elucidate the scales of variability (temporal and spatial) in nearshore habitats
- To increase coastal community marine awareness and improve the state of benthic taxonomy
- To assess the interactive effects of multiple drivers, including human activities, on spatial patterns of biodiversity in marine coastal communities at the global scale
- To identify hot spots of marine coastal biodiversity, suitable to become new Marine Protected Areas

Questions NaGISA hopes to elucidate answers for:

- Are there intertidal and subtidal hotspots of biodiversity?
- Does biodiversity truly decrease towards the poles (both in the intertidal and subtidal)?
- Do organisms become less abundant towards the ends of their ranges?
- What is the rate of new species discoveries with NaGISA sampling?
- Can the NaGISA sampling determine species or habitat range extensions?

II. Synthesis management

a. Lead synthesis writer

Ann Knowlton with the assistance of the NaGISA SSG

b. Synthesis team and individual’s responsibilities for project synthesis and overall deliverables to the CoML

<table>
<thead>
<tr>
<th>Name</th>
<th>Contact</th>
<th>Responsibilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ann Knowlton, University of Alaska Fairbanks, USA</td>
<td><a href="mailto:knowlton@sfos.uaf.edu">knowlton@sfos.uaf.edu</a></td>
<td>Synthesis coordination; M&amp;V liaison ; E&amp;O coordinator</td>
</tr>
<tr>
<td>Yoshihisa Shirayama, Seto Marine Biological Laboratory, Kyoto University, Japan</td>
<td><a href="mailto:meiobenthos2007@yahoo.co.jp">meiobenthos2007@yahoo.co.jp</a></td>
<td>WPAC region contributions to McIntyre Chapter; lead author Introduction to NaGISA special issue</td>
</tr>
<tr>
<td>Brenda Konar, University of Alaska Fairbanks, USA</td>
<td><a href="mailto:bkonar@guru.uaf.edu">bkonar@guru.uaf.edu</a></td>
<td>EPAC region contributions and lead writer for McIntyre Chapter; lead author Macroalgae and co-author Echinoderm papers for NaGISA special issue</td>
</tr>
<tr>
<td>Katrin Iken, University of Alaska Fairbanks, USA</td>
<td><a href="mailto:iken@ims.uaf.edu">iken@ims.uaf.edu</a></td>
<td>PS region contributions to McIntyre Chapter; co-author Echinoderm paper for NaGISA special issue</td>
</tr>
<tr>
<td>Name</td>
<td>Contact</td>
<td>Responsibilities</td>
</tr>
<tr>
<td>------</td>
<td>---------</td>
<td>------------------</td>
</tr>
<tr>
<td>Patricia Miloslavich, Universidad Simón Bolívar, Venzuela</td>
<td><a href="mailto:pmilos@usb.ve">pmilos@usb.ve</a></td>
<td>SAS region contributions to McIntyre Chapter; editor, co-author concluding paper, and co-author for Mollusk paper for NaGISA special issue</td>
</tr>
<tr>
<td>JJ Cruz, Universidad Simón Bolívar, Venzuela</td>
<td><a href="mailto:juancruz@usb.ve">juancruz@usb.ve</a></td>
<td>CS region contributions to McIntyre Chapter; lead author Rocky Community paper for NaGISA special issue</td>
</tr>
<tr>
<td>Gerhard Pohle, Huntsman Marine Science Center, Canada</td>
<td><a href="mailto:gpohle@huntsmanmarine.ca">gpohle@huntsmanmarine.ca</a></td>
<td>AO region contributions to McIntyre Chapter; lead author Decapod paper for NaGISA special issue; co-lead HMAP-NaGISA cross-project</td>
</tr>
<tr>
<td>Lisandro Benedetti-Cecchi, University of Pisa, Italy</td>
<td><a href="mailto:lbenedetti@biologia.unipi.it">lbenedetti@biologia.unipi.it</a></td>
<td>ES region contributions to McIntyre Chapter; lead author Polychaete paper for NaGISA special issue; co-lead for FMAP-NaGISA cross-project</td>
</tr>
<tr>
<td>Edward Kimani, Kenya Marine and Fisheries Research Institute, Kenya</td>
<td><a href="mailto:ekimani@kmfri.co.ke">ekimani@kmfri.co.ke</a></td>
<td>IO region contributions to McIntyre Chapter; arrange author for Seagrass paper for NaGISA special issue</td>
</tr>
<tr>
<td>Tom Trott, Suffolk University, USA</td>
<td><a href="mailto:codfish2@earthlink.net">codfish2@earthlink.net</a></td>
<td>Lead PI HMAP-HNS-NaGISA cross project synthesis; lead author concluding paper for NaGISA special issue; lead writer children’s book</td>
</tr>
<tr>
<td>Tohru Iseto, Seto Marine Biological Laboratory, Kyoto University, Japan</td>
<td><a href="mailto:tohru_iseto@hotmail.com">tohru_iseto@hotmail.com</a></td>
<td>Database and website management</td>
</tr>
</tbody>
</table>

**III. Synthesis Products**

**a. Overall deliverable to CoML**

NaGISA will submit in December 2009 its contribution to the Project Synthesis Volume (McIntyre book). A tentative plan for the chapter is in progress and should be finalized in Fall 2008. The writing phase will follow. We expect some sections to be completed during the CoML Synthesis Workshop in February 2009, while others will be completed by Fall 2009.

Tentative layout of NaGISA contribution to the Project Synthesis Volume:

*I. The Known (Status of discipline prior to Census)*

- Historical perspective of taxonomic knowledge
  - Discuss how regional taxonomy fits in with global taxonomy (i.e. discuss issues with “global” taxonomy)
- Historical knowledge of patterns of variability
  - Discuss what is known about global nearshore biodiversity
- Historical knowledge of nearshore hotspots and trends in biodiversity
- History of NaGISA
2. From Unknown to Known (Evolution of discipline during the Census)
   - Identification of major gaps (geographic, taxonomic)
     - Discuss how taxonomic issues limited NaGISA
     - Approaches taken to closing gaps - involvement of local communities and stakeholders
     - Major findings (variability patterns, taxonomic discoveries)
     - Implementations (monitoring efforts, adoption of protocols)
     - New questions

3. The Currently Unknown (Remaining gaps)
   - What can be learned with continuing NaGISA efforts?
     - How can we get remote areas and still unknown areas surveyed?

4. How Can we Move From Unknowable to Knowable (Novel approaches to resolve the currently “impossible”)
   - Selection of hot-spot locations for future hypothesis testing, e.g. high diversity regions, key species distribution boundary areas, etc
   - Ideas to move the goalposts and survey remote and still unknown areas (dream cruises)
   - Blueprint for the future (beyond 2010)

5. Conclusions (Major findings and major gaps, how to move forward)
   - Overall synthesis of NaGISA efforts and results
   - Practical suggestions on how knowledge/understanding might be moved forward from here.

b. Project-Specific Products

<table>
<thead>
<tr>
<th>Outputs</th>
<th>Lead author &amp; Deadline</th>
</tr>
</thead>
<tbody>
<tr>
<td>NaGISA special issue: articles analyzing global distribution and abundance patterns of selected taxa (macroalgae, seagrasses, decapod crustaceans, mollusks, echinoderms and polychaetes)</td>
<td>P Miloslavich (editor) and all NaGISA, PLoS-One (tentatively), Fall 2010</td>
</tr>
<tr>
<td>Marine benthic fauna of the Patagonian fjord region (field guide)</td>
<td>V Häussermann, G Försterra, Huinay Foundation, early 2009</td>
</tr>
<tr>
<td>Influence of taxonomic resolution and morphological functional groups in multivariate analyses of macroalgal communities</td>
<td>Konar et al., Phycologia, submitted 2008, in review</td>
</tr>
</tbody>
</table>
### Outputs

| Organizing collaborative initiatives at a regional level in South America (e.g. bringing together experimental ecologists working in rocky shores) | P Miloslavich and JJ Cruz-Motta |
| Rocky shore faunal community structure within the intertidal and shallow subtidal zone of the Gulf of Maine and Bay of Fundy | T Trott, G Pohle and P Lawton, anticipated in 2009 |
| Nearshore benthic macrofauna of western Africa. Sites sampled July 2008 | G Pohle and T Trott, anticipated in 2009 |
| Temporal change in species diversity and distribution in a megatidal estuary (Minas Basin, Bay of Fundy, Canada) | N Gibson and A Redden, anticipated 2009 |
| Biodiversity in Arctic nearshore boulder communities | K Iken et al., anticipated in 2009 |

### For the General Public

| NaGISA children’s book | T Trott, anticipated Fall 2010, publisher TBD |
| NaGISA Venezuela will collaborate with the museum of natural science to elaborate an itinerant exhibit about rocky shores in Venezuela (description, treatise and conservation measures) | JJ Cruz-Motta and P Miloslavich |
| The NaGISA project in Venezuela is going to implement during 2008 and 2009 a series of workshops with two coastal communities to increase their awareness about their immediate environment and how they might get involved to use it in a sustainable manner. | P Miloslavich and JJ Cruz-Motta |
| Smithsonian world ecosystem atlas – kelp forest contribution | K Iken, 2007 |
| Kyoto University Aquarium permanent display for ‘Research in Action’ module, and in the process of improving NaGISA’s section to an interactive ‘wet’ display. | Y Shirayama, 2007 and ongoing |
| Video documentaries of NAGISA activities in the Caribbean and South American shores
  - Short video (5-10 minutes) for CoML website
  - Longer documentary in Spanish to be shown at local and regional levels | P Miloslavich and JJ Cruz-Motta, anticipated broadcasts in 2009 |
| NaGISA segment in CBC TV special on the state of the oceans in Canada. | G Pohle for NaGISA, anticipated broadcast in 2009/10 |

### For Conservation Stakeholders, Off Shore Industry and Environmental agencies

c. Cross-Project Products

A list of cross-project products and contributions to larger CoML synthesis efforts is provided with NaGISA leaders or contacts identified.

<table>
<thead>
<tr>
<th>Type of Product</th>
<th>Leader</th>
<th>Collaborating CoML Projects</th>
<th>NaGISA contacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Nearshore biodiversity: what can the past reveal about the future? (target journals: Science, Nature)</td>
<td>T Trott (HNS)</td>
<td>HNS, HMAP, NaGISA</td>
<td>T Trott, G Pohle</td>
</tr>
<tr>
<td>3. The nearshore: past, present, future (overall product)</td>
<td>L Benedetti-Cecchi (NaGISA), C Mora (FMAP), T Trott (HNS)</td>
<td>HNS, HMAP, NaGISA, FMAP</td>
<td>L Benedetti-Cecchi, T Trott</td>
</tr>
<tr>
<td>4. Contributions to the Marine Barcode of Life</td>
<td>D Steinke</td>
<td>MarBOL, NaGISA</td>
<td>A Knowlton</td>
</tr>
<tr>
<td>5. Contributions to the Encyclopedia of Life</td>
<td></td>
<td></td>
<td>A Knowlton</td>
</tr>
</tbody>
</table>

IV. Visualization and Mapping

NaGISA will participate in the Mapping and Visualization Workshop (Ann Knowlton, liaison) and will contribute products for the CoML website. These products will likely include, but are not limited to, GIS maps of global diversity patterns of key nearshore taxonomic groups and communities overlaid with habitat information. An interactive 3D map/globe is envisioned where a user can zoom in on a specific region to look at location of sampling sites, zoom in closer to see pictures of a specific site, zoom in even closer to view an individual sampling quadrat. Maps that show species ranges with links to Encyclopedia of Life and Algaebase species entries, and Genus-level phylogenetic trees are also of interest. Additional products will be considered and developed after the workshop in October 2008.

V. Synthesis timelines

<table>
<thead>
<tr>
<th>Dates</th>
<th>Items</th>
<th>Leaders or Contacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-12 August 2008</td>
<td>NaGISA SSG Workshop, Caracas, Venezuela</td>
<td>P. Miloslavich</td>
</tr>
<tr>
<td>10 September 2008</td>
<td>NaGISA SSG conference call</td>
<td>A. Knowlton</td>
</tr>
<tr>
<td>15 September 2008</td>
<td>Annual Report Due to CoML</td>
<td>K. Iken and SSG members</td>
</tr>
<tr>
<td>September 2008</td>
<td>Database available for regional data uploading</td>
<td>T. Iseto, A. Knowlton</td>
</tr>
<tr>
<td>1 October 2008</td>
<td>NaGISA 2009-10 Renewal proposal due to CoML</td>
<td>A. Knowlton and SSG members</td>
</tr>
<tr>
<td>15 October 2008</td>
<td>NaGISA 2009-10 Renewal proposal due to Sloan</td>
<td>A. Knowlton and SSG members</td>
</tr>
<tr>
<td>Dates</td>
<td>Items</td>
<td>Leaders or Contacts</td>
</tr>
<tr>
<td>----------------------</td>
<td>------------------------------------------------------------------------</td>
<td>--------------------------------------</td>
</tr>
<tr>
<td>20-24 October 2008</td>
<td>5th World Fisheries Congress, Yokohama, Japan.</td>
<td>Y. Shirayama (HQ, WPAC)</td>
</tr>
<tr>
<td></td>
<td>Session chair: Assessment of biodiversity and ecosystem services with NaGISA presentations:</td>
<td>P. Miloslavich (SAS)</td>
</tr>
<tr>
<td></td>
<td>– Marine biodiversity associated to rocky shores and seagrasses in South America: a latitudinal comparison using the global Natural Geography in Shore Areas (NaGISA) project</td>
<td>J. Cruz-Motta (CS)</td>
</tr>
<tr>
<td></td>
<td>– Biodiversity of rocky shores and seagrasses in Venezuela: results of the NaGISA project</td>
<td></td>
</tr>
<tr>
<td>27-28 October 2008</td>
<td>NaGISA Western Pacific Conference, Jakarta, Indonesia</td>
<td>Y. Shirayama, T. Iseto</td>
</tr>
<tr>
<td>11-15 November 2008</td>
<td>World Conference on Marine Biodiversity, Valenica, Spain</td>
<td>B. Konar (EPAC)</td>
</tr>
<tr>
<td></td>
<td>– Macroalgal biodiversity across our global sea (oral presentation)</td>
<td>K. Iken (PS)</td>
</tr>
<tr>
<td></td>
<td>– Biodiversity in Arctic boulder fields (oral presentation)</td>
<td>L. Benedetti-Cecchi, I. Bertocci (ES)</td>
</tr>
<tr>
<td></td>
<td>– Interactive effects of red and white noise processes on marine coastal biodiversity</td>
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<tr>
<td>December 2008</td>
<td>Database direct link to OBIS active</td>
<td>T. Iseto, A. Knowlton</td>
</tr>
<tr>
<td>January 2009</td>
<td>Storyline for children’s book completed (tentative, publisher TBD)</td>
<td>T. Trott</td>
</tr>
<tr>
<td>Early January 2009</td>
<td>NaGISA SSG conference call</td>
<td>A. Knowlton</td>
</tr>
<tr>
<td>1-5 February 2009</td>
<td>CoML Synthesis Workshop, Long Beach</td>
<td>NaGISA group</td>
</tr>
<tr>
<td></td>
<td>– NaGISA SSG meeting/workshop</td>
<td></td>
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<tr>
<td></td>
<td>– HMAP-HNS-NaGISA workshop</td>
<td></td>
</tr>
<tr>
<td>1 April 2009</td>
<td>Synthesis papers &amp; drafts provided to Paul Snelgrove for inclusion in Census Digest Book</td>
<td>SC members and project leaders</td>
</tr>
<tr>
<td>Early May 2009</td>
<td>NaGISA SSG conference call</td>
<td>A. Knowlton</td>
</tr>
<tr>
<td>26-28 May 2009</td>
<td>Oceans Past II</td>
<td>T. Trott</td>
</tr>
<tr>
<td></td>
<td>– HMAP-HNS-NaGISA workshop</td>
<td></td>
</tr>
<tr>
<td>July 2009</td>
<td>FMAP-NaGISA workshop (location TBD)</td>
<td>L. Benedetti-Cecchi</td>
</tr>
<tr>
<td>August 2009</td>
<td>HMAP-HNS-NaGISA virtual meeting</td>
<td>T. Trott</td>
</tr>
</tbody>
</table>
## Synthesis Plan

<table>
<thead>
<tr>
<th>Dates</th>
<th>Items</th>
<th>Leaders or Contacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>August 2009</td>
<td>FMAP-NaGISA draft product due</td>
<td>L. Benedetti-Cecchi</td>
</tr>
<tr>
<td>15 August 2009</td>
<td>Submission of Drafts of NaGISA contribution to the CoML 2010 Report &amp; other final products of the synthesis, including within and cross-project products</td>
<td>SC members and project leaders</td>
</tr>
<tr>
<td>Early September 2009</td>
<td>NaGISA SSG conference call</td>
<td>A. Knowlton</td>
</tr>
<tr>
<td>November 2009</td>
<td>FMAP-NaGISA workshop (location TBD)</td>
<td>L. Benedetti-Cecchi</td>
</tr>
<tr>
<td>November 2009</td>
<td>HMAP-HNS-NaGISA virtual meeting</td>
<td>T. Trott</td>
</tr>
<tr>
<td>December 2009</td>
<td>Drafts of NaGISA special issue manuscripts due to editor (PloS One – tentative)</td>
<td>P. Miloslavich</td>
</tr>
<tr>
<td>December 2009</td>
<td>**HMAP-HNS-NaGISA workshop, draft product due (location TBD)</td>
<td>T. Trott</td>
</tr>
<tr>
<td>December 2009</td>
<td>FMAP-NaGISA final product due</td>
<td>L. Benedetti-Cecchi</td>
</tr>
<tr>
<td>30 December 2009</td>
<td>Submission of NaGISA contribution to the CoML 2010 Report &amp; other final products of the synthesis, including within and cross-project products</td>
<td>SC members and project leaders</td>
</tr>
<tr>
<td>Early January 2010</td>
<td>NaGISA SSG conference call</td>
<td>A. Knowlton</td>
</tr>
<tr>
<td>February 2010</td>
<td>Reviews of NaGISA special issue manuscripts back to authors</td>
<td>P. Miloslavich</td>
</tr>
<tr>
<td>February 2010</td>
<td>**HMAP-HNS-NaGISA final product due</td>
<td>T. Trott</td>
</tr>
<tr>
<td>April 2010</td>
<td>Overall HMAP-NaGISA-FMAP final product due</td>
<td>T. Trott, L. Benedetti-Cecchi</td>
</tr>
<tr>
<td>Early May 2010</td>
<td>NaGISA SSG conference call</td>
<td>A. Knowlton</td>
</tr>
<tr>
<td>May 2010</td>
<td>Revised NaGISA special issue manuscripts due to editor</td>
<td>P. Miloslavich</td>
</tr>
<tr>
<td>31 June 2010</td>
<td>Final deadline for submission of special issue to journal</td>
<td>P. Miloslavich</td>
</tr>
<tr>
<td>Early September 2010</td>
<td>NaGISA SSG conference call</td>
<td>A. Knowlton</td>
</tr>
<tr>
<td>Fall 2010</td>
<td>Publication of NaGISA special issue</td>
<td>P. Miloslavich</td>
</tr>
<tr>
<td>Fall 2010</td>
<td>Publication of children’s book (tentative, publisher TBD)</td>
<td>T. Trott</td>
</tr>
<tr>
<td>4-7 October 2010</td>
<td>Census “Grand Celebration”, London</td>
<td>NaGISA group</td>
</tr>
</tbody>
</table>

**NOTE:** A due date later than December 2009 for final product was discussed with CoML (D. Crist) since funding will not be available until January 2009 to start project (funded through NaGISA renewal proposal, not through Synthesis Group cross-projects).
VI. NaGISA Response to Selected Synthesis Committee Comments

For the London 2010 celebration, NaGISA would like to highlight the science that has been and is being accomplished within the project. Major aspects of the results are encompassed in the “NaGISA Special Issue” being planned for publication in PLoS-One (tentative). Another highlight to be showcased is NaGISA’s outreach efforts of involving the public and local communities in its research and sampling efforts. We have spent substantial effort in making science accessible to the public in a very hands-on manner, and allowing local communities to gain “ownership” of knowledge of their local marine resources. Other products that could be highlighted in London are contributions to the overall synthesis products, various publications and field guides, and books, such as the NaGISA children’s book that is being planned.

NaGISA recognizes the Synthesis Committee’s concern that NaGISA’s products, as originally presented, seem “less ambitious” and more regionally oriented than plans of the past. An outcome of the NaGISA Steering Committee meeting in early August is the development of more globally-oriented syntheses and products (e.g. PLoS-One Special Issue). NaGISA has scaled back on the number of products to reflect a more realistic set of synthesis products. In addition, many of the products listed in prior plans were the brainstorms of Robin Rigby and with her untimely death we lost many of the ideas and contacts that she was developing. In many aspects NaGISA had to recreate or rediscover itself.
Appendix E: NaGISA Proposal to *PLoS-ONE*

NaGISA’s full proposal to *PLoS-ONE* for a NaGISA special issue can be viewed in our 2008 Annual Report. A condensed version highlighting the proposed articles is presented here. This proposal has been approved by *PLoS-ONE*.

**CENSUS OF MARINE LIFE: NaGISA SYNTHESIS**
**PROPOSAL TO PLOS-ONE JOURNAL FOR A SPECIAL ISSUE**
**AUGUST 2008**

**Title:** BIODIVERSITY PATTERNS OF GLOBAL NEARSHORE COMMUNITIES

**Editor:** Patricia Miloslavich

**Main Contributors:**
Katrin Iken, University of Alaska Fairbanks, USA  
Brenda Konar, University of Alaska Fairbanks, USA  
Ann Knowlton, University of Alaska Fairbanks, USA  
Juan Cruz, Universidad Simón Bolívar, Venezuela  
Patricia Miloslavich, Universidad Simón Bolívar, Venezuela  
Lissandro Benedetti-Cecchi, University of Pisa, Italy  
Iacopo Bertocci, University of Pisa, Italy  
Thomas Trott, Suffolk University, USA  
Yoshihisa Shirayama, University of Kyoto, Japan  
Tohru Iseto, Kyoto University, Japan  
Edward Kimani, Kenyan Institute of Marine and Fisheries Research Institute, Kenya  
Jackeline Uku, Kenyan Institute of Marine and Fisheries Research Institute, Kenya  
Gerhard Pohle, Atlantic Reference Center, Canada

**Articles:**
- Introductory article. Y. Shirayama et al.: The concept of NaGISA. Main questions the project seeks to answer. The protocol. History of how the regional groups were organized and began activities. Global map of the NaGISA sites and the communities sampled.

- Regional / taxonomic articles:
  1. A global comparison of community assemblages in the nearshore (J Cruz et al)
  2. Spatial patterns of decapod diversity in nearshore environments (G Pohle et al)
  3. Gastropod assemblages in worldwide nearshore communities (P Miloslavich, JM Diaz, G Bigatti et al)
  4. Spatial patterns of macroalgal diversity in rocky intertidal environments (B Konar, K Iken et al)
  5. Spatial patterns of macroalgal diversity in rocky subtidal environments (B Konar, K Iken et al)
  6. Polychaetes around the world (L Benedetti et al)
  7. Echinoderm diversity in the rocky shores (K Iken, B Konar, et al)
  8. A quantitative assessment of seagrass beds around the world (J Uku et al)

- Integrative article. T Trott and P Miloslavich: conclusions of NaGISA. Analysis of latitudinal and longitudinal gradients of diversity, distribution and abundance of macroalgae, seagrasses, decapods, gastropods, echinoderms and polychaetes
Appendix F: Funding Support for NaGISA (other than the Sloan Foundation)

The value of these commitments is not a pledge of match/cost share by the University of Alaska Fairbanks. The value represents contributions leveraged from our other partners.

<table>
<thead>
<tr>
<th>Sponsor</th>
<th>PI</th>
<th>Award Objective</th>
<th>Amount (USD)*</th>
<th>Year</th>
<th>Award Term</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australian Antarctic Division</td>
<td>K Iken</td>
<td>NaGISA in Antarctica (in-kind support)</td>
<td>~$20,000</td>
<td>2008</td>
<td>2</td>
</tr>
<tr>
<td>Centre for Marine Biodiversity</td>
<td>G Pohle</td>
<td>NaGISA field and labwork support for Cobscook Bay site</td>
<td>$12,131*</td>
<td>2008</td>
<td>1</td>
</tr>
<tr>
<td>Chevron</td>
<td>P Miloslavich JJ CruzMotta</td>
<td>Geografía Natural en áreas costeras (NaGISA): Venezuela</td>
<td>$482,000</td>
<td>2007</td>
<td>3</td>
</tr>
<tr>
<td>Department of Fisheries &amp; Oceans, Canada</td>
<td>G Pohle</td>
<td>Supporting NaGISA protocol activities in the Quoddy Bay area</td>
<td>$15,867*</td>
<td>2007</td>
<td>1</td>
</tr>
<tr>
<td>Department of Fisheries &amp; Oceans, Canada</td>
<td>G Pohle</td>
<td>NaGISA intertidal and shallow subtidal sampling at Simpsons Island</td>
<td>$15,867*</td>
<td>2008</td>
<td>1</td>
</tr>
<tr>
<td>Department of Fisheries &amp; Oceans, Canada</td>
<td>M Wong, A Silva</td>
<td>Establishment of NaGISA sites for long term monitoring of benthic biodiversity in nearshore habitats on the Atlantic coast of Nova Scotia</td>
<td>$47,594*</td>
<td>2008</td>
<td>3</td>
</tr>
<tr>
<td>Environmental Trust Fund</td>
<td>G Pohle</td>
<td>New Brunswick near-shore environmental monitoring &amp; baseline assessment - Canadian lead participation in a world-wide initiative toward sustainable ecosystem resource management</td>
<td>$23,330*</td>
<td>2007</td>
<td>1</td>
</tr>
<tr>
<td>Italian Ministry of University, Research and Education</td>
<td>L Benedetti-Cecchi</td>
<td>Resistance and resilience of coastal biodiversity to the effects of environmental changes on local and global scales</td>
<td>$28,653*</td>
<td>2008</td>
<td>2</td>
</tr>
<tr>
<td>Japan Society for the Promotion of Science</td>
<td>Y Shirayama</td>
<td>Coastal oceanography</td>
<td>$14,376*</td>
<td>2007</td>
<td>1</td>
</tr>
<tr>
<td>Japan Society for the Promotion of Science</td>
<td>Y Shirayama</td>
<td>Coastal oceanography</td>
<td>$14,376*</td>
<td>2008</td>
<td>1</td>
</tr>
<tr>
<td>Nippon Foundation</td>
<td>Y Shirayama</td>
<td>Promotion of NaGISA project in the western Pacific region</td>
<td>$172,513*</td>
<td>2008</td>
<td>2</td>
</tr>
<tr>
<td>Nippon Foundation</td>
<td>Y Shirayama</td>
<td>Promotion of NaGISA project in the western Pacific region</td>
<td>$191,681*</td>
<td>2008</td>
<td>1</td>
</tr>
<tr>
<td>Suffolk University, USA</td>
<td>T Trott</td>
<td>Support Cobscook Bay HNS site, report at Benthic Ecology Meeting</td>
<td>$16,960*</td>
<td>2007</td>
<td>1</td>
</tr>
</tbody>
</table>

Total Funding Support: $1,055,348

*Funds not reported in USD were converted on 17 September 2008 using Universal Currency Converter (http://www.xe.com/ucc/) and may not reflect exchange value at the time funds were received.
Appendix G: NaGISA Milestones Report

Project Milestones: NaGISA
(Abbreviated version, for complete version see Annual Report 2008)

Category 1: Participation
Participation in NaGISA activities is linked with the cohesiveness and leadership of NaGISA HQ. Restructuring of HQ in summer 2008 revitalized NaGISA and reconnected the eight regional centers (Figure 1).

2008
- SGG Meeting – all regions represented
- Sampling occurred in all 8 geographic regions for both seagrass and macroalgal habitats
- Incorporation of new sampling sites to fill geographical gaps, especially in newer regions (e.g. AO, PS, and IO regions)
- Establish new connections to local communities and schools where sampling is being established; include communities in field activities
- Transitioning of select sites within each region to long-term monitoring with community and/or student involvement
- Compilation of global datasets on nearshore biodiversity (selected taxa); analysis and presentation of results (first uses of global dataset to be presented at MARBEF, November 2008; additional presentations of NaGISA data at World Fisheries Congress, October 2008)
- Completion of baseline sample processing on target taxa
- Participation in CoML M&V workshop (October 2008)

2009
- All regions will be represented at the CoML Queen Mary Synthesis Workshop (February 2009); SSG meeting will be held in conjunction with the workshop
- All regions participating in development of synthesis products, including overall deliverables to CoML (e.g. McIntyre synthesis book, Snellgrove synthesis book, NRIC volume)
- Development of NaGISA overall products (global biodiversity papers, children’s book): all regions participating
- Development of regional synthesis products
- Development of cross-project synthesis products (HMAP-NaGISA, FMAP-NaGISA)
- Continuation of field work, especially in newer regions; more long-term monitoring sites established in each region
- Establish new connections with nearshore researchers and high school groups not already in the NaGISA network

2010
- All regions will participate in finalizing synthesis products
- Participation in CoML Grande Celebration (October 2010)
- Sponsor special sessions at one or more scientific conference
- Establish more community connections for long-term monitoring; increase the NaGISA nearshore network
Category 2: Funding Commitments

NaGISA’s administrative structure has depended on funding from the Sloan Foundation, including funding for HQ personnel, and some funding for the regional offices, meetings, capacity-building workshops, etc. Funds for field work and sample processing have primarily been obtained from other regional sources.

2008
- NaGISA database development and maintenance: Sloan Foundation (USA)
- AO field and lab activities: Centre of Marine Biodiversity (Canada), Department of Fisheries & Oceans (Canada)
- Field guide publication costs: Nippon Foundation (Japan)
- WPAC student exchange program between Japan and Southern Asia: Nippon Foundation (Japan)
- CS/SAS regional manager support, field lab activities: Chevron (Venezuela)
- ES proposal on the effects of environmental change of coastal biodiversity: Italian Ministry of University and Research

2009
- Cross-project synthesis activities (HMAP-NaGISA, FMAP-NaGISA): Sloan Foundation – pending renewal
- Field guide publication costs: Nippon Foundation, Sloan Foundation (Chilean benthos – pending renewal)
- Development of children’s book: Sloan Foundation – pending renewal
- AO field and lab activities: Centre Department of Fisheries & Oceans (Canada) – in progress
- AO proposal to support work in west Africa: Global Environment Facility – potential
- WPAC continuation of student exchange program: Nippon Foundation – to be requested
- Continued support of CS/SAS regional manager: Chevron (Venezuela)
- 2nd year of ES proposal on the effects of environmental change of coastal biodiversity: Italian Ministry of University and Research
- PS field sampling (Casey Station): Australian Antarctic Division in-kind support

2010
- Children’s book publication costs: Sloan Foundation – pending renewal
- WPAC continuation of student exchange program: Nippon Foundation – to be requested
- WPAC regional networking workshops: JSPS (Japan) – to be requested
- PS field sampling (Davis Station): Australian Antarctic Division in-kind support
- ES proposal for continued work: Italian Ministry of University and Research – to be requested

Category 3: Partnerships

2008
- Regional collaborations within NaGISA fostered (e.g. taxonomic assistance, sampling, etc.)
- Establish cross-project syntheses with other CoML projects: HMAP, FMAP
- Continue existing CoML collaborations: ArcOD, CAML, Euro-CoML, GoMA, OBIS, NRICs
- Develop/maintain partnerships with regional and national agencies working in the nearshore: Alaska Monitoring and Assessment Program (USA), Department of Fisheries and Oceans (Canada), Ministry of Environment (Japan), Ministry of Housing, Lands and the Environment (Barbados)
- Develop/maintain partnerships with research institutions and universities: MARBEF (Belgium), EMPAFISH (Spain), Institute of Marine Science (Tanzania), Suffolk University (Maine), Suffolk University Dakar (Senegal), Zoological Institute St. Petersburg (Russia), Alaska Sea Grant Marine Advisory Program (USA), San Diego State University (USA), Universidad Autónoma de Baja California Sur (Mexico), University of British Columbia (Canada), University of New Brunswick (Canada), Acadia University (Canada), Sir James Dunn Academy (Canada),
University of the West Indies (Trinidad and Tobago), JSPS multinational benthos group (Japan), Smithsonian Tropical Research Institute (Panama), Instituto de Investigaciones Marinas y Costeras (Colombia), Universidad de la Habana (Cuba), Universidade do Parana (Brasil), Museo de Ciencias Naturales (Argentina), Universidad de Mar del Plata (Argentina), Centro Nacional Patagónico (Argentina), Universidad de Guayaquil (Ecuador), Circumpolar Biodiversity Monitoring Program (Norway), University Saint Malaysia (Malaysia), University of Philippines Visayas (Philippines), Institution of Oceanography (Indonesia), Hanoi Institution of Oceanography (Vietnam), Phuket Marine Biological Center (Thailand), Ecology Café (Japan), Shizugawa Nature Center (Japan), University of Lecce (Italy), University of Bologna (Italy), Centro Interdisciplinar de Investigação Marinha e Ambiental (Portugal), Marine Biological Association (UK), Hellenic Centre for Marine Research (Greece), University of Gdansk (Poland), University College Dublin (Ireland), Medicinal Plant Conservation Project (Egypt). Australian Antarctic Division (Australia)

- Develop/maintain partnerships with major funding organizations: Alfred P. Sloan Foundation (USA), Chevron (Venezuela), Nippon Foundation (Japan)

2009
- Maintain established partnerships
- Develop new research partnerships to fill in geographic gaps and increase network base
- Search out new funding sources for long-term monitoring projects

2010
- Develop new partnerships; maintain established collaborations
- Support NaGISA beyond 2010 through the NAGISA network of nearshore scientists

Category 4: Program Management
NaGISA reorganized its management structure in 2008 to better address current issues in communication and prepare for increased demands and coordination during the synthesis phase. Within International Headquarters, a Senior Scientist and two co-Project Leaders will direct and advise NaGISA’s activities for the ensuing synthesis phase. Two new headquarters managers, one based in Japan, the other based in the US, will coordinate and manage NaGISA’s database, website, financial distributions, communications, E&O, M&V, and synthesis activities. NaGISA activities within specific geographical regions will be coordinated by regional PIs with the assistance of regional managers. It is primarily at this level that interaction with local communities, students, and volunteers will occur through sampling activities, outreach programs, and marine education and awareness presentations.

2008
- Two HQ managers hired (Iseto, Knowlton), HQ restructured to include Sr. Advisor (Shirayama) and co-Project Leaders (Iken, Konar)
- SSG meeting (Caracas, Venezuela, August 2008); mini-SSG meeting at World Biodiversity Conference (Valencia, Spain, November 2008)
- SSG quarterly conference calls (started September 2008)
- Continued communication among HQ, regional PIs and regional managers
- Hiring of regional staff as needed (e.g. AO: PI, manager; WPAC: manager)

2009
- Financial distribution to regional centers by HQ (pending Sloan renewal)
- SSG quarterly conference calls
- SSG meeting during CoML Long Beach Synthesis Workshop (February 2009); mini-SSG meetings when opportunities arise during other scientific meetings

2010
- NaGISA special session at one or more scientific conferences (possible meetings include Benthic
Ecology Meeting, Western Society of Naturalists Annual Meeting, Hong Kong Biodiversity Symposium, International Temperate Reefs Symposium
• SSG quarterly conference calls
• Mini-SSG meetings when opportunities arise during other scientific meetings
• CoML Grande Celebration (London, October 2010)

**Category 5: Observations Made or Otherwise Obtained**

**2008**
• Identify target taxa (macroalgae, echinoderms, polychaetes, mollusks, decapods, seagrass) from collected samples and upload datasheets to database for inclusion in NaGISA special issue papers on global biodiversity trends
• Identify gaps in coverage within each region; establish contacts in gap areas to activate sites
• Transition key sites within each region to long-term monitoring

**2009**
• Maintain long-term monitoring and transition additional sites in each region to long-term monitoring; develop simple indices for use by local communities
• Establish support of long-term monitoring programs with national governments, research institutions, museums, K-12 schools, and universities
• Activate sites within coverage gaps
• Complete sample processing of all samples collected through 2008; upload data to NaGISA database
• Contribute to MarBOL and EoL

**2010**
• Complete all sample processing of baseline global data; upload to NaGISA database
• Continue long-term monitoring at established sites in each region under regional/national programs

**Category 6: Scientific Results; Societal Outcomes; Legacies**

By 2010 NaGISA will have established an extensive network of nearshore workers including scientists, researchers, teachers, students, and government officials dedicated to increasing the catalog of nearshore information. This network will be available to interested scientists and people and will continue to grow well beyond 2010. NaGISA’s database will become a focal point and a portal allowing nearshore researchers to disseminate their results to others scientists and the general public.

**2008**
• Continue long-term monitoring in Kachemak Bay, Alaska; Point Loma, California; and Shirahama; continue to involve university courses in these efforts
• Develop simple monitoring indices suitable for long-term monitoring use by local communities
• Establish partnerships with other nearshore researchers and organization (e.g. PISCO, EPA, EMAP); partnership with AKMAP established (Alaska), Department of Fisheries and Oceans (Canada)
• Completion of NaGISA database

**2009**
• Continue existing long-term monitoring activities (Alaska, California, Japan); establish long-term monitoring sites in other regions
• Involve local communities in long-term monitoring activities
• Strengthen integration of marine research institutions for long-term monitoring of the nearshore; establish partnerships with governmental agencies and other nearshore researchers; establish NaGISA as a national assessment program in Japan (Monitoring 1000)
- Increase involvement of university students in nearshore research using NaGISA protocols: incorporate into course curricula and theses methodology
- Capacity building of future policy makers through the NaGISA High School Initiative

**2010**
- Long-term monitoring at sites in all regions with community and student involvement
- Establish partnerships to see NaGISA continue beyond 2010
- Prepare NaGISA database to be opened to the public (tentatively 2011)

### Category 7: Tangible Outputs

**2008**
- **Websites**: 2: NaGISA’s own website; research journal of AO Region field and lab activities on GoMA website
- **Database**: 1, NaGISA’s database with link to OBIS
- **Workshops**: 4: Nematode taxonomy in Japan; protocol in Malaysia; protocol in Ecuador; sampling workshop in Japan
- **Books/chapters**: 4: Field guide to the echinoderms (sea cucumbers and sea stars) of Malaysia (Yasin et al. 2008); Environmental variability in hard bottom assemblages: Analysis and ecological implications (Benedetti-Cecchi) and Mechanisms underpinning diversity-stability relationships in hard bottom assemblages (Benedetti-Cecchi). Both in: Ecology of benthic communities (M. Wahl ed.). Springer. (*in press*); Aquatic animals, a field guide for children (Shirayama) [in Japanese]
- **University Classes using NaGISA protocols**: 7 in USA, Japan, Venezuela

**2009**
- **Peer-reviewed papers**: 4: Rocky shore faunal community structure within the intertidal and shallow subtidal zone of the Gulf of Maine and Bay of Fundy (Trott et al); Nearshore benthic macrofauna of western Africa (Pohle and Trott); Temporal change in species diversity and distribution in a megatidal estuary (Minas Basin, Bay of Fundy, Canada) (Gibson and Redden); Biodiversity in Arctic nearshore boulder communities (Iken et al)
- **Books**: 5: Marine benthic fauna of the Patagonian fjord region (Häussermann and Försterra); Field guide to hermit crabs of Indonesia; Field guide to gastropods of Philippines; Field guide to benthos of Halong Bay, Vietnam; Field guide to nudibranchs of Thailand
- **University Classes using NaGISA protocols**: 10+
- **K-12 schools involved**: 11 in USA, Italy, Japan, Tanzania

**2010**
- **Peer-reviewed papers**: 10+: NaGISA special issue including 10 peer-reviewed papers on global biodiversity patterns of selected taxa and communities, *PLoS-ONE*;
- **Books/chapters**: 2+: Children’s book on nearshore biodiversity (Trott et al); NaGISA chapter for McIntyre synthesis book (Konar et al); contributions to the Snelgrove synthesis book and NRIC synthesis volume
Category 8: Outreach and Education; Recognition

Strong outreach and education is one of NaGISA’s unique aspects. From its conception, NaGISA was involved with reaching out to local communities and offering educational activities at a variety of levels.

2008

- Mentor and support NaGISA High School Initiative
- Involvement in K-12 classrooms; activities range from classroom visits to incorporating NaGISA activities in the curriculum to including students and teachers in NaGISA field sampling; participation in guidance meetings for high school students preparing for college; all regions are involved in these types of activities
- NaGISA presentations and use of protocols in university courses
- Documentaries: NaGISA segments will be included in two documentaries to be aired in 2008 and later (CBC’s Land and Air, air date November 2008; Richard Morris’ CoML video documentary)
- Exhibits: Kyoto University Aquarium, and an exhibit to be developed in Venezuela
- Website updates: information (ongoing) and new interactive maps (after M&V workshop)

2009

- Increased number of university courses utilizing NaGISA protocols in curricula
- Continued involvement in K-12 classrooms
- Expansion of NaGISA High School Initiative: teams to be established in Crete and possibly San Salvador
- Development of a children’s book on nearshore biodiversity
- Development of modified NaGISA protocols for implementation and monitoring of sites by local communities
- Website updates: inclusion of short animation on nearshore biodiversity

2010

- Special sessions sponsored at scientific conferences
- Implementation of community-based monitoring of select NaGISA using a simplified protocol to detect changes in community structure

Category 9: Data Management

2008

- Completion of final version of NaGISA database (ready Fall 2008)
- Continued uploading of data to OBIS; direct link with NaGISA database will be established by December 2008, with “manual” transfer of NaGISA data to OBIS occurring until link is active
- Regional uploading of data to NaGISA database (starting Fall 2008); focusing on taxa targeted for NaGISA special issue

2009

- Maintenance contract for database negotiated with OBIS-Canada to extend beyond March 2010
- Continued uploading of regional data
- Submission of HNS historical data (AO, IO, EPAC, ES regions)

2010

- Database maintenance
- Continued uploading of regional data including HNS historical data
- Establishment of long-term monitoring programs and partnerships with governmental agencies and programs using NaGISA’s database as a repository (e.g. AKMAP with EPAC, DFO with AO)
• Prepare to open NaGISA database to the public (anticipated in 2011)

**Category 10: Synthesis**
Our data are biogeographical in nature and directly relate to CoML synthesis plans without extensive translation. Maps and visual representations will aid in disseminating the results. NaGISA has developed regional, global, and cross-cutting synthesis projects and will be contributing to CoML’s overall synthesis products.

**2008**
- Synthesis activities outlined and coordinated at SSG meeting (August 2008) with quarterly conference calls to confirm timely completion of synthesis goals and facilitate collaboration among regional PIs
- Development of renewal proposal to Sloan with contributions from all regions
- Participation in the Mapping & Visualization workshop (Duke University, October 2008) and development of interactive maps and visualizations for websites and presentations
- Participation in the development of CoML animations

**2009**
- Participation in CoML Queen Mary Synthesis Workshop (Long Beach, CA, February 2009); NaGISA SSG meeting in conjunction
- All regions collaborating in overall CoML synthesis products (e.g. McIntyre chapter, Snelgrove synthesis book, NRIC special issue); drafts and final versions completed according to CoML timeline
- Development of manuscripts for NaGISA special issue in PLoS-ONE (proposal approved) and children’s book; collaboration by all regions
- Development of cross-project syntheses products: HMAP-NaGISA cross-project product draft completed by December 2009; FMAP-NaGISA cross-project final product completed by December 2009
- Regional synthesis products developed
- Publication of field guides: Chilean Fjords Benthic Fauna, Hermit Crabs of Indonesia, Gastropods of the Philippines, Benthos of Halong Bay, Vietnam (tentative), Nudibranchs of Thailand (tentative)

**2010**
- Participation in CoML Grande Celebration (London, October 2010); all regional PIs and HQ personnel
- Publication of regional products, NaGISA special issue, children’s book, HMAP-NaGISA cross-project product
- Development and publication of overall HMAP-NaGISA-FMAP cross-project product
Appendix H: CVs of NaGISA PIs (HQ & Regional)

Katrin Iken
School of Fisheries and Ocean Sciences
University of Alaska Fairbanks
P.O. Box 757220, Fairbanks, Alaska 99775 USA
Phone: 907-474-5192 Fax: 907-474-7204 E-mail: iken@ims.uaf.edu

Professional Preparation:
1987 B.A. University of Düsseldorf (Germany)
1991 M.S. University of Bayreuth (Germany)
1995 Ph.D. Alfred Wegener Institute of Polar and Marine Research (Germany)

Appointments:
2007-present Associate Professor in Marine Biology. School of Fisheries and Ocean Sciences, University of Alaska Fairbanks
2002 – 2007 Assistant Professor in Marine Biology. School of Fisheries and Ocean Sciences, University of Alaska Fairbanks.
1999 – 2001 Postdoctoral Research Fellow, University of Alabama at Birmingham.
1996 – 1999 Postdoctoral Research Fellow, Alfred Wegener Institute of Polar and Marine Research

Selected Peer-reviewed Publications (out of 35 total):
Konar, B., Iken, K. in press. Influence of taxonomic resolution and morphological functional groups in multivariate analyses of macroalgal assemblages. Phycologia

Selected Synergistic Activities:
Development of Curricular Materials at UAF: 4 new graduate-level courses
Workshop Organizer: Arctic Ocean Diversity Workshop to start a new Census of Marine Life field program (2003), Primer-E workshop to analyze NaGISA community data
Development of extra-curricular activities for K-12 and community groups, including Alaska Native communities, on marine biology and ecology
Scientific reviewer: 6 peer-reviewed journals, 5 scientific funding agencies
Thesis sponsor: currently 1 PhD, 4 MS students; formerly 1 PhD, 3 MS students
Brenda Konar  
School of Fisheries and Ocean Sciences  
University of Alaska Fairbanks  
P.O. Box 757220, Fairbanks, Alaska 99775  
Phone: 907-474-5028    Fax: 907-474-5804    E-mail: bkonar@guru.uaf.edu

Professional Preparation:  
1986 BA Zoology    San Jose State University, San Jose, CA  
1991 MS Marine Sciences    Moss Landing Marine Laboratories, CA  
1998 PhD Biology    University of California, Santa Cruz

Appointments:  
2004-present    Associate Professor. School of Fisheries and Ocean Sciences, University of Alaska Fairbanks and Staff Scientist for the West Coast and Polar Regions National Undersea Research Center.  
2006- present    Science Director Kasitsna Bay Laboratory. University of Alaska Fairbanks.  
2004-2006    Interim Lab Director Kasitsna Bay Laboratory. University of Alaska Fairbanks.  
2000 -2004    Assistant Professor. School of Fisheries and Ocean Sciences, University of Alaska Fairbanks and Staff Scientist for the West Coast and Polar Regions National Undersea Research Center.  
1999 - 2000.    Research Assistant Professor, School of Fisheries and Ocean Sciences, University of Alaska Fairbanks and Staff Scientist for the West Coast and Polar Regions National Undersea Research Center.

Selected Peer-reviewed Publications (out 21 total):  

Thesis Sponsor:  
University of Alaska Fairbanks:  
Currently: chair for 6 graduate students, committee member for 2 graduate students  
Formerly: chair for 8 graduate students, committee member for 6 graduate students
Yoshihisa Shirayama
Seto Marine Biological Laboratory,
Field Science Education and Research Center
Kyoto University 459, Shirahama, Wakayama 649-2211, Japan
Phone: +81-739-42-3515  Fax: +81-739-42-4518
E-mail: yshira@seto.kyoto-u.ac.jp or yshira@bigfoot.com

Professional Preparation:
1970-1973  Toyama Metropolitan High School
1973-1977  Institute of Zoology, Faculty of Science, University of Tokyo
1977-1982  Graduate School, Faculty of Science, University of Tokyo

Appointments:
1982-1984  Postdoctoral Fellow, Japan Society for Promotion of Sciences
1984-1991  Assistant Professor, Ocean Research Institute, University of Tokyo
1991-1997  Associate Professor, Ocean Research Institute, University of Tokyo
1997- present  Professor, Seto Marine Biological Laboratory, Faculty of Science, Kyoto University
1998-present  Director and Professor, SMBL, Graduate School of Science, Kyoto University
2003-present  Director and Professor, SMBL, FSERC, Kyoto University
2007-present  Director, FSERC, Kyoto University

Selected Peer-reviewed Publications (out of 169 total):

Selected Synergistic Activities:
Scientific societies: membership in 10 organizations, current or former board member for 7 of the organizations
Editorial board member for 2 scientific journals
Scientific committees: current of former member of 17 regional, national, and international scientific committees
Tohru Iseto
Seto Marine Biological Laboratory
Field Science Education and Research Center
Kyoto University 459, Shirahama, Wakayama 649-2211, Japan
Phone: +81-739-42-3515  Fax: +81-739-42-4518
E-mail: tohru_iseto@hotmail.com

Professional Preparation:
2002  PhD  University of the Ryukyus
1999  MS  Tokyo Institute of Technology
1996  BS  University of the Ryukyus

Professional Experience:
2008-present  Program-Specific Assistant Professor (NaGISA Project), Seto Marine Biological Laboratory, Faculty of Science, Kyoto University
2006-2008  Lecturer, University Education Center, University of the Ryukyus
2003-2006  Postdoctoral Fellow, Japan Society for Promotion of Sciences

Selected Peer-reviewed Publications (out of 11):

Scientific Societies:
Zoological Society of Japan
Japanese Society of Systematic Zoology
International Bryozoology Association
Ann L. Knowlton
School of Fisheries and Ocean Sciences
University of Alaska Fairbanks
PO Box 757220, Fairbanks, AK 99775-7220 USA
Phone: +1 (907) 474-5073        Fax: +1 (907) 474-7204
Email: knowlton@sfos.uaf.edu

Professional Preparation:
2002 PhD Marine Biology University of Alaska Fairbanks, USA
1992 BS Biology Utah State University, USA

Appointments:
2008-present Project Manager and Education & Outreach Liaison, Natural Geography in Shore Areas (NaGISA), a project of the Census of Marine Life; School of Fisheries and Ocean Sciences, University of Alaska Fairbanks.
2007-2008 Instructor, Department of Watershed Sciences, Utah State University.
2003-2005 Term Instructor, Biology Department, Western Washington University.

Peer-reviewed Publications:

Selected Synergistic Activities:
Thesis sponsor: committee member for 1 MS thesis; advisor for 4 undergraduate projects
Outreach teaching: taught Marine Biology for two high school summer programs (1997-2008); organized merit badge workshops for scouts (1998-2002); classroom visits
Lisandro Benedetti-Cecchi
Dipartimento di Biologia
University of Pisa
Via Derna 1, I-56126 Pisa, Italy
Phone: +39 050 2211413  Fax: +39 050 2211410
E-mail: lbenedetti@biologia.unipi.it
Web: http://www.discat.unipi.it/BiolMar/people/LBC/LBC.htm

Professional Preparation:
1993  PhD  Marine Ecology  University of Pisa

Appointments:
1993-1995  Post Doctoral Researcher (University of Pisa)
1995-1998  Contract Professor (University of Urbino)
1998-2004  Lecturer in Ecology (University of Pisa)
2000 & 2002  Visiting Researcher (University of Sydney)
2005-present  Associate Professor in Ecology (University of Pisa)

Selected Peer-reviewed Publications (out of 73 total):
doi:10.1371/journal.pone.0002777

doi:10.1371/journal.pbio.0060162


Selected Synergistic Activities:
Editorial activity: appointed associate or contributing editor of 4 scientific publications
Member of the Review Panel of the European Science Foundation for the EUROCORES program
Coordinator for Europe of the global-scale project NaGISA (Natural Geography In Shore Areas), one of the Census of Marine Life projects supported by the Sloan Foundation of Washington.
Coordinator of the European project BIOFUSE (together with Dr Tasman Crowe, University of Dublin), a Responsive Mode Programme within the European Network of Excellence MARBEF (Marine Biodiversity and Ecosystem Functioning).
Juan José Cruz-Motta
Departamento de Estudios Ambientales
Universidad Simón Bolívar
Caracas, Venezuela
juancrizi@usb.ve

Professional Preparation:
2002 PhD Science University of Sydney, Australia.
2000  MS Tropical Marine Biology James Cook University, Australia.
1994  Licenciado Degree Biology Universidad Simón Bolívar, Venezuela.

Appointments:
2005-present Lecturer, Departamento de Estudios Ambientales, USB
2006-present Head of the Laboratory of Experimental Ecology, USB
2007-present.: Member of the Advice Council of the Coordination of Biology (Postgraduate Program) at USB
2007-present.: Member of the Advice Council of the Institute of Technology and Marine Sciences at USB
2005 – present: Honorary Associated Academic Staff of the Centre for Research on Ecological Impacts of Coastal Cities, USYD.
2002 -2004 Researcher assistant of the Centre for Research on Ecological Impacts of Coastal Cities, USYD.
1998 – 2000 Researcher of the Department of Marine Biology and Aquaculture, JCU.
1994 – 1997 Researcher of the Institute of Technology and Marine Sciences at USB

Selected Peer-reviewed Publications (out of 12 total):

Selected Synergistic Activities:
Scientific reviewer: peer-reviewer for 7 scientific journals
Thesis sponsor: supervisor for 4 undergraduate theses, 1 MS thesis and 1 PhD, committee member of several MS/PhDs in Biological Sciences
Edward Ndirui Kimani
Senior Research Officer, Kenya Marine & Fisheries Research Institute
P.O. Box 81651 80100, Mombasa, Kenya.
Phone: +254722670037
Email: ekimani@kmfri.co.ke or edwardndirui@yahoo.com

Professional Preparation:
2006  PhD  Zoology  University of Nairobi, Kenya
1996  MS  Marine Science  University of Rykyus, Japan
1989  BS  Botany and Zoology  University of Nairobi, Kenya

Appointments:
1990-present  Marine Ecologist at Kenya Marine and Fisheries Research Institute, currently
               Senior Research Officer
2006-present  NaGISA PI for the Indian Ocean Region

Selected Peer-reviewed Publications:
Kimani, E.N., K.M. Mavuti, T. Mukiama and W. Nina. 2008. Settlement of macrofauna on pearl
mangrove: the effect of turbidity and distance. *Western Indian Ocean Journal of Marine
Science* (Accepted)
Haxham, M., E.N. Kimani and J. Augley. 2007. Stable isotope records from otoliths as tracers of
fish migration in a mangrove system. *Journal of Fish Biology* 70: 1554-1567
Kimani, E.N., K.M. Mavuti and T. Mukiama. 2006. The reproductive cycle of the pearl oyster
*Pinctada imbricata* in Gazi Bay, Kenya. *Tropical Zoology* 19: 159-174
structure between forested and cleared habitats. *Estuary Coastal and Shelf Science* 60:
637-647
Kimani E.N. 1996. The larval development and juvenile growth of the silver mouth turban,
*Turbo argyrostromus* (Mollusca, Prosobrachia). *Asian Journal of Marine Biology* 13; 105-
116
shallow tropical mangrove estuary, Gazi, Kenya. *Marine and Fresh Water Research*
47:857-68.
Patricia Miloslavich  
Departamento de Estudios Ambientales  
Universidad Simón Bolívar  
Caracas, Venezuela  
pmilos@usb.ve

**Professional Preparation:**
- 1995 PhD Oceanography, Université du Québec a Rimouski, Canada.
- 1990 MS Biological Sciences, Universidad Simón Bolívar, Venezuela.
- 1987 Licenciado degree Biology, Universidad Simón Bolívar, Venezuela.

**Appointments:**
- 2005-present Senior Professor, Departamento de Estudios Ambientales, USB
- 2008-present Senior Scientist for the Census of Marine Life Program
- 2008-present Head of the Marine Biology Laboratory, USB
- 2007-present Member of the Advice Council of the Coordination of Biology (Undergraduate Program) at USB
- 1994-present Curator of the Collection of Aquatic Organisms of the Museo de Ciencias Naturales, USB.
- 2002-2004 Coordinator of the programs Licenciado in Biology, Master and PhD in Biological Sciences at USB.

**Selected Peer-reviewed Publications (out of >25 total):**

**Selected Synergistic Activities:**
- Scientific reviewer: peer-reviewer for 10 scientific journals; reviewer of multiple scientific project proposals, national and international.
- Principal researcher and co-researcher in 21 projects, national and international
- Thesis sponsor: currently advisor for 1 undergraduate and 2 PhD theses, formerly advisor for 3 undergraduate and 2 MS theses; committee member of several MS and PhD theses in Biological Sciences at USB
Gerhard W. Pohle
Huntsman Marine Science Center
1 Lower Campus Road
St. Andrews, New Brunswick, Canada E5B 2L7
gpohle@huntsmanmarine.ca

Professional Preparation:
1982 PhD University of Toronto

Appointments:
1984-present Curator of Invertebrates & Senior Applied Projects Scientist, Atlantic Reference Centre (ARC), Huntsman Marine Science Centre (HMSC), St. Andrews, New Brunswick, Canada
2002-present Associate Director, HMSC
2004-2005 Acting Executive Director, HMSC
1995-present Adjunct Professor, University of New Brunswick
2006-present Principal Investigator, NaGISA Atlantic Ocean region

Selected Peer-reviewed Publications:

Responsibilities and Relevant Experience:
1) Basic grant-supported research on evolutionary relationships among Crustacea;
2) applied research in the area of environmental impact assessments via analysis of benthic community structure (incl. ROV technology), and development and implementation of marine biodiversity monitoring protocols;
3) 25 years of taxonomic experience with most marine and estuarine invertebrate groups;
4) development of on-line species information systems;
5) training of highly qualified personnel (technicians, graduate students, postdoctoral fellow);
6) supervision of systematic laboratory, technical staff, procurement of contracts from government and industry to support staff at ARC;
7) leading and participating in marine research and survey cruises