

## **Abstract: Families by the Seaside: Building community-based outdoor ocean science learning experiences**

It is difficult for many informal science education centers (ISECs) to create meaningful learning experiences for underserved/underrepresented (UU) families. Often, ISEC program staff lack the tools and awareness required to do so; yet, it is these families who can benefit most from outdoor, informal science education. Although most ISECs work with community-based organizations (CBOs) who serve UU families, the institutional and staff relationships are usually built on a program-by-program basis. Additionally, finding ways to include the right Web 2.0 platform on the right device is challenging enough when attempting to reach “traditional” science center audiences; it is compounded when working with UU families.

The proposed project will work over three years with ISEC/CBO teams from five coastal communities from Portsmouth, NH to Mystic, CT in order to: (1) create audience-informed outdoor ocean-literacy learning experiences *for* underserved/underrepresented (UU) families by *including them* in the program development process; (2) customize Encyclopedia of Life’s (EOL) Web 2.0 tools for use by UU families; and (3) formalize working relationships between informal science education centers (ISEC) and community based organizations (CBO) by creating five teams of ISEC/CBO staff to develop and implement the family program.

The project is divided into four phases of activity.

*Phase 1: Establishing a Community of Practice.* CBO and ISEC staff will work together in a series of facilitated and evaluated meetings and content workshops. RMC Research Corporation (RMC) will solicit input from program partners to develop a needs assessment (established via focus groups) of the target audiences. These efforts will lay the groundwork for Phase 2.

*Phase 2: Developing a field program.* CBO-ISEC teams design their own site-specific field programs for Worlds Oceans Day. The programs are based on results of focus groups and informed by science/community programs workshop and will focus on ocean literacy principles and concepts with input from NOAA-scientists.

*Phase 3: Applying Web2.0 technology.* Concurrent with the field program development, the science and technology group (led by EOL) will evaluate existing Web2.0 tools and train project staff through a Technology Workshop. These will be field tested in a family program for International Coastal Cleanup Day.

*Phase 4: Supporting continuing and ongoing learning.* Partners will determine the best ways to support continued participation via Web2.0 applications, revise programming according to participant feedback, implement revised field programs to reach new participants, and support follow-up learning among past participants.

This project will extend ocean literacy to reach a broader public audience. Outcomes will include: enriching the content of existing coastal education programs using ocean literacy principles; extending audience engagement using new technology; building capacity of informal educators through professional development; expanding partnerships with community based organizations; strengthening collaboration among informal science education institutions in the region.

## **Families by the Seaside: Building community-based outdoor ocean science learning experiences**

### **Project overview**

The proposed 3-year program will advance the way informal ocean science education institutions reach underserved/underrepresented (UU) families by facilitating and formalizing relationships between informal science education centers and community based organizations. Project teams in five New England communities will collaborate to create a practicable, outdoor ocean-science learning experience specifically designed for families in their shared service area.

Building on a needs assessment produced through target-audience focus groups, the program will combine coastal field experiences with web-based interactive and participatory learning activities developed and tested by the Encyclopedia of Life (EOL)<sup>1</sup>; and the Northeast Regional Association for Coastal and Ocean Observing Systems (NERACOOS) to support in-field and ongoing learning. Science content will be informed and vetted by NOAA research scientists<sup>2</sup> and work between the science centers and community organizations will be professionally facilitated. Formats and effectiveness will be evaluated by external evaluators and revised throughout the project.

This project not only meets an expressed need by Community Based Organizations (CBO) to provide outdoor science learning experiences for their families, it aligns with many of NOAA's Education Strategic Plan goals (see Objectives and Goals) and meets the following aspects of the National Research Council's (1) recommendations. This project is:

- Designed with specific learning goals in mind, specifically Science Strand 1: participants will engage in an exciting way that will pique their interest and motivate them to learn more.
- Is interactive, and provides multiple ways for learners to engage with concepts, practices, and phenomena within a particular setting.
- Facilitates science learning across multiple settings: in the field and at home
- In the program design and through follow-on learning opportunities, participants can interpret their learning experiences in light of prior knowledge and interests, and extend their learning over time.
- Is based on scientific problems that are *chosen by* the community members.
- Program format and content are created through an iterative process: developed and revised three times by learners, educators, designers, and experts

Participating informal science education centers (ISEC) are members of NEOSEC, a diverse network of 40 science and education-based organizations<sup>3</sup> committed to achieve ocean literacy. Formed in 1998, NEOSEC has become the region's principal vehicle for coordinating informal ocean literacy efforts in New England. ISEC participants have expertise in outdoor education. Participating research members have experience translating their work for science center

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<sup>1</sup> [www.eol.org](http://www.eol.org)

<sup>2</sup> Science content will be informed by scientists and experts from the National Weather Service, Gray, ME (NWS), NERACOOS, University of New Hampshire Sea Grant.

<sup>3</sup> NEOSEC has a diverse membership: museums and aquariums, camps and schools, universities and research institutions between Maine and Connecticut, NEOSEC's mission is to leverage New England's extraordinary educational, research and coastal assets to engage the public in understanding the vital connections between people and the ocean. Since 2002, NEOSEC has convened an annual Ocean Literacy Summit. The Summit is a highly anticipated forum for informal and classroom educators to work with scientists to develop new tools to advance ocean science education. In 2009 130 participants attended the Summit.

audiences and are committed to ensuring that informal science education contains formally vetted science content.

### ***Background***

It is difficult for many informal science education centers (ISECs) to increase UU audiences' appreciation and understanding of the interconnectedness of people and the environment. These families traditionally do not visit informal science education sites, either because it is not common within their background, culture or simply due to financial, transportation, or other limitations. Often, ISEC program staff lack the tools and awareness required to create meaningful learning experiences for these families. And yet, it is these families who can benefit most from outdoor, informal science education. Outside nature programs have proven to improve children's communication skills, decrease aggressive behavior, and reduce stress. Nature programs not only improve student grades, but improve students' eyesight and health. (2)

Although most ISECs have worked with community based organizations (CBOs) who serve UU families, the institutional and staff relationships are usually built on a program-by-program basis. That model of linking science educators with community resources has fallen short, despite "...clear and strong commitment among...practitioners to [broaden] participation in science learning. This project builds on the National Research Council's finding that "schools cannot do it alone..." (1) by bringing together the skills sets of these CBO and ISEC professionals to create a program that meets the social needs of the CBOs and science mission of the ISECs. Perhaps more importantly, the program will be designed with a high degree of respect for the pride and privacy sensitivities of UU families, acknowledging that they may be interested in learning and in science, but outdoor education is not a life priority. Families chosen by CBO staff will shape and direct the format and content areas of their program: resulting in a learning experience *created by this audience, for this audience.*

Finding ways to include the right platform on the right device is challenging enough when attempting to reach "traditional" science center audiences; it is compounded when working with UU families. This project will survey UU families to understand how they use technology.

By creating a program for a specific audience, the project meets several of the key findings of the Ocean Project's public literacy survey. (3) The ISECs are trusted sources for the public to learn about ocean science. The targeted ages of the families' children (5-16) are within the age class (12-17) that was found to care about the ocean, and is willing to act and influence their parents. Additionally, the project's use of the internet and Web 2.0 products meets the survey's charge that "Aquariums, zoos, and museums, as well as other conservation-oriented organizations and agencies, must better leverage the Internet to communicate about conservation and mobilize the public to take action." For the target audience, "action" may be as basic as understanding that personal actions can have positive environmental impacts.

### ***The Learning Experience***

The outdoor learning experience will be developed by the following teams of ISEC and CBO program staff. The geographic range and demographics of populations reached through these partnerships are defined in the description of each organization

1. Seacoast Science Center and Portsmouth Housing Authority: Rye & Portsmouth, NH
2. BOAT CAMP, and Jumpstart Youth Connection: Newburyport & Amesbury, MA
3. The Marine Science Center and Girls, Inc.: Lynn, MA
4. New England Aquarium and Chelsea Intergenerational Learning Center: Boston, & Chelsea, MA

## 5. Mystic Aquarium and Subase New London Navy Child and Youth Programs: Mystic, & Groton, CT

Together, they will create a practicable, sustainable outdoor ocean-science learning experience specifically designed for families and youth in their shared service area.

The project will result in five audience-informed programs: each team will customize an initial format. Because the ISECs specialize in different aspects of marine science, the project will also result in five regional versions of the core content. Web-based learning activities will be incorporated into the overall program to extend and enhance the educational outcomes from the Field day and to allow continued exploration on one's own. The breadth of experiences from the five regional centers and the web-based activities will provide model learning projects that can be transferred to other ISEC/CBO teams around the country.

Although the final learning experiences will be designed to meet the expressed needs and interests of UU audiences, it is expected that the science content and general format will be appropriate for all families. Thus, it is anticipated that the programs will be incorporated into other New England Ocean Science Education Collaborative (NEOSEC) members' family programming.

The Encyclopedia of Life Learning + Education group will make freely available web-based tools, resources and species content to support and enhance the learning experiences. Described below, these tools and resources span from EOL species pages,<sup>4</sup> to marine biodiversity podcasts with call-outs for public participation to shared learning platforms. These tools provide multiple ways for families and staff to contribute to EOL species pages by writing text, uploading images or sending videos to social networking communities that can be fostered through all the Centers' websites and/or EOL's Facebook, Twitter groups and the EOL Blog.

The customizable field guide and observation journaling tools will enable each ISEC/CBO group to create digital and downloadable materials specific to their location. The field guide tool will be enhanced to allow individuals or groups to select species and filtered content from the main EOL pages to be viewed in a way that makes sense for their individual needs. The observational journaling tool will allow individuals to upload images and possibly video and audio, as well as information about the species, location and other observations they make, allowing a personal or group record of activities to be developed throughout the project. Participants can see their collective effort toward documenting local marine biodiversity.

The field guide will be tested through the NOAA-funded *Summer Science in New England* program for summer camps, at the 2010 Biscayne Bay BioBlitz, as well as with other projects, and will be available for this project in fall 2010. The observational journaling tool will be in prototype format next fall for the UU families to use.

In addition to the field guide and journal, family participants and/or project staff can add images including photographs, videos, and scanned drawings to EOL. Those that can be tagged with species names with the help of identification guides or ISEC staff can be uploaded to EOL species pages through the EOL Flickr<sup>5</sup> group, while other images will be shown in the L+E Photo Gallery. Approximately 1,850 members of the international public have already contributed over 48,000 images to the EOL Flickr group, demonstrating the interest and

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<sup>4</sup>.Species pages provide a rich array of content that is available to be reused and repurposed for end-user projects.

<sup>5</sup>.[flickr.com/groups/encyclopedia\\_of\\_life/](http://flickr.com/groups/encyclopedia_of_life/)

commitment of the general public in helping to build the EOL and share their contributions. Having the images and information on the web will allow families and individuals to share the work they have done and the contributions they made to the project. In addition, continued user feedback will inform EOL regarding modifications necessary to make the tools more useable and functional for a breadth of end-users in a variety of settings.

Finally, the EOL Education LifeDesk<sup>6</sup> tool could be used by participants in conjunction with ISECs' education staff. LifeDesk is an online environment that provides a collaborative space for creating, editing, and publishing web pages of species information including images and text. Although the goal of using a LifeDesk is to generate content to publish to EOL, LifeDesks can be used in a variety of ways. There is no requirement to publish content out to EOL. Content can also be generated for other taxonomic levels, for example, at the genus or family level. The LifeDesk environment provides content management tools that enable instructors or others to setup groups (for example, a Seacoast Science Center/Portsmouth Housing Authority group or an overall project group) and manage content, evaluation, assignments, and group members. In this way, ISEC education staff could work in a supervised way with participants to co-create species pages enabling greater learning about the local marine biodiversity while collaborating on finding and uploading valid information and learning about the scientific process.

The Web 2.0 component of this proposal builds on a previous NOAA educational investment: EOL's utilization of those tools in New England Aquarium/NEOSEC's *Summer Science* program during summer 2009. Feedback about the tools from *Summer Science* will inform the modifications made to the tools for this project.

### ***Sustainability beyond the grant period***

The newly developed programs will be sustainable by virtue of their origin and design. Because the content-level and format meet expressed needs and interests of the target audience, it is more likely to remain popular with UU families. Popularity and participation are core criteria to ensure that the program will become a permanent part of the teams' program calendars. Just as important, however, is that the program will be designed to be inexpensive, built on existing program efforts. Both ISECs and CBOs are perpetually resource-limited; the team members understand that the project's programs and activities must complement and supplement their work rather than encumber their time and resources.

Sustainability also implies ease-of-further-funding; this project is highly fundable as evidenced by a recent local donor's support of a Seacoast Science Center/Portsmouth Housing Authority (PHA) program<sup>7</sup>. When a long-standing donor was informed of a PHA option, she enthusiastically chose it. Equally portentous was her willingness to "spread the word" among her peers, many of whom are generous supporters of Portsmouth's social services, but less invested in environmental education.

This program already has a receptive audience of NEOSEC members. Many ISECs are eager for effective tools to reach UU audiences. The proposed program will deliver needs-based data, tested field programming, and open-source Web2.0 platforms. These can be the basis for similar programming across the region, as well as giving both ISECs and CBOs proven and popular educational products.

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<sup>6</sup>.edulifedesks.org

<sup>7</sup> A Center donor benefit is the ability to send students or children in a group (e.g. scouts) to the Center for a program.

### ***Collaboration***

Together, ISECs, CBOs, and science and technology partners will develop programs that meet the interests and needs of the target audience. In addition to developing the programs themselves, this project will give ISECs a much-needed understanding of their local UU audiences, and those audiences' understanding of, and interest in, the oceans. Through focus groups, facilitated exchange, and content workshops, program staff in the ISEC/CBO teams will learn best practices, techniques, science content, application of accessible technologies and the special requirements, and needs of CBO client families. Strong evaluation and continued program revision are critical components to creating an audience-friendly, practicable and sustainable program.

The partnerships formalized in this project are another valuable project outcome; it expands a proven collaboration: NEOSEC. Although ISEC participants work with CBOs that serve NOAA's UU audiences, their ISEC/CBO relationships are unstructured; existing on a program-by-program basis, rather than through joint efforts to meet shared educational goals. An important objective of this project is to propose a model for ISECs to work with local CBOs to understand and meet the needs of UU families in their communities. Although the NEOSEC structure is the foundation of the project's organization, the Seacoast Science Center (SSC) is the lead applicant for the proposed work because outdoor learning is the core component of the program and SSC is NEOSEC's strongest provider of outdoor learning experiences. Additionally, NEOSEC members share in the responsibility of securing funding to perpetuate the collaborative's efforts. As a founding member of NEOSEC, the Seacoast Science Center is meeting this responsibility by submitting this application.

### **Objectives and Goals**

#### ***Relation to NOAA Strategic Plan***

This effort supports NOAA's 2009 *Education Strategic Plan* to "connect citizens to nature and the community" by "framing those connections in a local context with a social framework." The proposed place-based educational programs advance the following Outcomes of NOAA's *Plan*:

*Outcome 1.1: Evaluating Education*

*Outcome 1.2: Educators understand and use environmental literacy principles.*

*Outcome 1.3: Educators, students, and/or the public collect and use ocean, coastal, and weather, data in inquiry and evidence-based activities.*

*Outcome 1.4: Lifelong learners are provided with informal science education opportunities focused on ocean, coastal, weather, and climate topics.*

*Outcome 1.5: Promoting Partnerships.*

#### ***Project Goals and Objectives***

Goal 1. Create regional, audience-informed outdoor ocean literacy learning experiences for underserved/underrepresented families that incorporates EOL's Web 2.0 collateral.

*Objective 1a: evaluate means for information-gathering from UU audiences; Outcome: a tested protocol for developing audience-informed programming.*

*Objective 1b: develop template for outdoor OL experience that can be customized regionally*

*Outcome: a UU family-friendly outdoor learning experience.*

*Objective 1c: develop Web 2.0 collateral activities Outcome: practicable applications of technology to the outdoor program.*

Goal 2. Apply Web2.0 tools in ways feasible for use by UU families.

*Objective 2a:* determine “feasible” in terms of platform, software and access; *Outcome:* understanding audience use of and willingness to use Web 2.0 technologies for learning.

*Objective 2b:* incorporate Web 2.0 applications into field and follow-up learning; *Outcome:* tested application of Web 2.0 tools for UU families

Goal 3: formalize working relationships between ISECs and CBOs

*Objective 3a:* strengthen relationships between ISECs and CBOs through shared project experience; *Outcome:* self-reported increased appreciation for shared and disparate challenges, needs and opportunities

*Objective 3b:* build CBO science education capabilities *Outcome:* increase science programming by CBO staff and improved ocean literacy among UU families

*Objective 3c:* building ISEC staff skills in reaching UU audiences; *Outcome:* expanded capacity to reach new UU audiences

### **Description of proposed activities**

The program incorporates tenets of community-based research (4) and communities of practice, drawing on expertise of participants and program partners. (5, 6) The program timeline highlights specific project components and milestones; the following provides a summary of that work.

#### ***Activities Summary***

##### *Phase 1: Establishing a Community of Practice*

The program will begin with a kickoff meeting and full 6 months of work to establish trust and effective working relationships between CBO and ISEC staff. This effort, led by Teen Empowerment (TE), will establish program partners as both learners and experts, and generate mutual understanding of the operational practices and challenges of the CBO and ISEC cultures. Key components of this joint work will be a CBO-ISEC team meeting in February 2011 and a Science and Community Programs Workshop for all program partners in March 2011. At the same time, evaluator RMC will solicit input from program partners to develop a needs assessment (established via focus groups) of the target audiences. These efforts will lay the groundwork for Phase 2.

##### *Phase 2: Developing a field program*

With the goal of holding a family field experience associated with World Ocean Day in June 2011, CBO-ISEC teams will meet with TE to design their own site-specific field programs based on results of focus groups and informed by science/community programs workshop. The programs will focus on ocean literacy principles and concepts with the highest resonance with the target audiences. For example, coastal community members might indicate that they see a connection between the ocean and weather. In that case, with NERACOOS input, program partners can draw on data from the National Data Buoy Center (NDBC) to develop easily understood connections between sea states and local weather. These program plans will be shared with the larger NEOSEC membership. A debriefing meeting – as well as evaluation by RMC – will examine both the program process and the field experience.

##### *Phase 3: Applying Web2.0 technology*

Concurrent with the field program development, the science and technology (SciTech) group (led by EOL) will evaluate existing Web2.0 tools tested by EOL in other settings in light of information from the focus groups. Then, CBO and ISE staff will bring their experience with the field project to a debriefing meeting and joint Technology Workshop in June 2011. Working

from the SciTech group's recommendations, the program partners will choose tools feasible and realistic for the target audience. Over the course of the summer SSC will ensure that teams can combine the technology with the field program (revised based on formative evaluation), and NEOSEC will establish a section on their existing website for participants to use in follow-up learning (see Dissemination, below). All will be in place for a trip to the shore associated with International Coastal Cleanup Day (September 2011). RMC will gather evaluation data for both the process and program from participants and during a November 2011 debriefing meeting.

*Phase 4: Supporting continuing and ongoing learning*

During 2012, project partners will determine the best ways to support continued participation via Web2.0 applications, revise programming according to participant feedback, implement revised field programs to reach new participants (in June and September), and support follow-up learning among past participants. EOL and NERACOOS will work with SSC and NEOSEC to keep the behind-the-scenes aspects of the Web2.0 applications robust and glitch-free. This year will be critical to evaluating and refining the model process and program, disseminating challenges and successes, and where possible, establishing new means of support for continued collaboration and implementation.

**Addressing Ocean Literacy** Ocean Literacy Essential Principle (EP) #6 is the core goal for the learning experiences: helping families understand that their lives are indeed connected to the ocean. Further, they will leave the experience with some level of understanding that the oceans influence their lives, and the way they live their lives influences the oceans. It is expected that many of these families have not participated in many (if any) content-rich field learning experiences; few (if any) will have realized how the oceans influence weather (EP #3), or had the opportunity to appreciate the great biodiversity of life along their own coastlines (EP #5).

**Target audience** The program is designed for UU families with children ages 5-16. Pilot program participants will be recruited by CBOs in five New England communities.

**Incorporation of NOAA Mission goals, data and data products** One means for engaging new audiences around OL is highlighting the connection between the ocean and weather – for which NOAA data are well-suited. For example, tracking and anticipating a storm's path draws upon human experience, satellite and ocean buoy data, as well as forecast models of the atmospheric and oceanic environments. This critically important information is provided by core NOAA programs such as the National Weather Service (NWS) including the National Data Buoy Center (NDBC) as well as the Regional Associations (RAs) of the Integrated Ocean Observing System (IOOS) such as NERACOOS. Using nor'easters as an example will provide participants a view of the work scientists do to track and anticipate a storm's path, so they can prepare for the storm's arrival. Such storms' regional impacts throughout the communities' watersheds, the timescales involved in their study, and the dramatic nature of the storms themselves combine to create an exciting way for all families to learn about the connections between humans and complex earth systems (7).

**Evaluation** Outside evaluation will be conducted by RMC. The evaluation has been designed to support, document and assess the development of the proposed model of ISEC/CBO collaboration and ocean science programming for underserved audiences. Towards this end, the evaluation will include front-end, formative, and summative activities. The final evaluation report will address the overall process of the collaborative development of a model of ocean science field and Web 2.0 learning experience, as well as impact data and reflections on best practices. Impact data will focus an assessment of changes in UU families' attitudes, knowledge,

and awareness related to ocean literacy principals, as a result of the activities undertaken. Specific indicators will be developed during the evaluation process, but will be drawn from ocean literacy standards.

#### *Front-end evaluation activities*

At project start, RMC will conduct focus groups in each of the five targeted communities to gather baseline data which can be used to ensure that the program development process is sensitive to community interests and needs. These focus group discussions will build on community profiles regarding 1) specific areas of audience knowledge and interest in ocean literacy topics; 2) backgrounds, experiences and attitudes towards field study; 3) technology habits and 4) interest in different types of field and technology-based activities, and possible constraints, such as requiring transportation. These sessions will include both individual questionnaires and discussions. Activities may include photo-elicitation techniques in which participants are asked to respond to familiar and unfamiliar images (in this case of relevant coastal and ocean phenomena and processes) in order to reveal interests, biases, and knowledge related to the content area.

#### *Formative activities*

RMC will conduct a series of interviews and observations throughout the development and implementation phases in order to document the collaboration between CBOs and ISECs. These activities will focus on stumbling blocks and lessons learned in working across distinct professional cultures and communities. Another area of focus will include tracking the role and integration of information gathered during the front end evaluation into the project design.

#### *Summative activities*

RMC will design a mixed method summative evaluation which will be conducted during piloting of field programs around World Ocean Day. Surveys and discussions will be held to assess the extent to which the programs are successful in engaging UU families, and the extent to which the program has been successful in changes in knowledge, attitudes and awareness. A complete chart of project impacts and indicators will be designed for the project, and tailored as appropriate to each of the five programs, during the development phase. These will be produced by project leads at each of the five sites, under the direction of RMC, thus helping to build internal evaluation expertise. These finalized set of impacts and indicators will inform summative study instruments' design.

### **Project partners' roles and project coordination**

**NOAA Science & Technology Group** will design and present the science-content workshop for all team members, participate in NEOSEC Summit presentations and vet program content. EOL's Learning and Education (L+E) group will lead the implementation of the Web 2.0-based component of the program. EOL L+E staff, led by Director Marie Studer will attend workshops to guide participants through the availability and use of the websites and tools and provide ongoing support throughout the project by email and phone. In addition to Dr. Studer, group members include John Cannon, Senior Meteorologist of the National Weather Service in Gray, ME; Ru Morrison, Executive Director of Northeastern Regional Association of Coastal Ocean Observing Systems (NERACOOS), and Mark Wiley, Assistant Director for Marine Education, University of New Hampshire (UNH) Cooperative Extension/New Hampshire Sea Grant.

**Evaluation** RMC Research's Alice Apley has designed and will lead the implementation of the project's evaluation plan.

**Facilitation** Sapna Padte, Director of Consulting and Training for Teen Empowerment, will facilitate establishment of inter-disciplinary (i.e., CBO-ISEC) working partnerships and joint project development.

**Project management** SSC President Wendy Lull will oversee all work under the grant. Education Director Perrin Chick will ensure that project goals are met on time and on budget, and supervise the project coordinator.<sup>8</sup> The coordinator in turn will be responsible for managing the project teams, coordinating focus groups, team planning and debriefing meetings, and otherwise maintain open communications between program partners. In addition to phone calls, and two site visits/year, the coordinator will choose an appropriate on-line communication platform<sup>9</sup> for facilitating information sharing between teams based on each group's technological capability. The coordinator and/or Ms. DiBona will attend as many of the teams' field programs as is practical (some may fall on the same day).

**Dissemination** NEOSEC Coordinator Pam DiBona will facilitate and organize NEOSEC-related activities including: presentations at Executive Council meetings and the Summit, oversight of the EOL-product web-site posting (on the NEOSEC Ocean7.org website), and dissemination to broader audiences.

#### **Key partners' organizational descriptions and capabilities of key personnel**

Founded in 1992, the *Seacoast Science Center* is located in Odiorne Point State Park near Portsmouth on the New Hampshire seacoast. Programs range in format from nature walks, and hands-on activities to travel programs, lectures and video-conference distance education delivered from the Gregg Interactive Learning Studio. The NOAA-funded Gregg Interactive Learning Studio is equipped with video conferencing and distance learning capabilities that extend the Center's educational reach across the nation. The 135 acre Park contains seven distinct natural habitats, which make exceptional outdoor classrooms. **Key Personnel:** *Wendy Lull* (603-436-8043 x15; w.lull@seacentr.org) has led the development of the Center and its educational program since its opening in 1992. On her watch, the Center has completed over \$3M in federally funded capital and exhibit projects. She plays a leadership role in strategic planning, policy development, and fundraising. Wendy is the Center's principal liaison to donors and corporate sponsors; foundations; legislators, as well as institutional and agency collaborators. Wendy is a founding member of NEOSEC, Past President of the New England Museum Association, and serves on the Engagement and Outreach Advisory Board, under the auspices Senior Vice Provost, UNH; she has been a grant reviewer for the National Science Foundation. Lull has published scientific papers, business strategy cases and edited the book *Footprints in Time*. She has received the following awards: *New Hampshire Magazine*: 2008 Women of Distinction; *Business Review*: 2007 Outstanding Women in Business, Oakland University: Odyssey Award. She earned her Master's Degree in Zoology at the UNH. *Perrin Chick* (603-436-8043; p.chick@seacentr.org) has been the Education Director at the Seacoast Science Center since 2002. She will oversee the project coordinator and will oversee the Center's educator in regards to the implementation of the family science event. As the 2009-2010 current Chair of the NEOSEC Executive Council, Perrin will serve as the program liaison between NEOSEC and the Seacoast Science Center. She oversees the development and implementation of all of the Center's school, camp and visitor programs. Prior to working at the Center, Perrin was

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<sup>8</sup> The part-time position of project coordinator will be filled pending grant award.

<sup>9</sup> NEOSEC members have successfully used wiggio.com.

a classroom teacher. While at the National Teacher Training Institute, she was recognized as Teacher Trainer of the Year. Perrin has an M.Ed. with a concentration in Curriculum Development from UNH.

**RMC Research Corporation** was founded in 1966 as a for-profit firm specializing in research, evaluation, training, and technical assistance for educational and human service agencies at the federal, state, and local levels. During the past 25 years RMC Research has gained a reputation for the quality and utility of its work, responsiveness to clients, and fiscal accountability. Primary clients include federal agencies and departments, state education agencies, and private philanthropies. RMC's Portsmouth, New Hampshire office has a rich history in the evaluation of informal science education experiences, including front end, formative and summative evaluations for museums and media clients. Recent work has included front end evaluation including community focus groups for the Nurture Nature Foundation, summative evaluation of the two season *Going Places in Science* series, examining both the collaboration between the television and museum staff, and children's learning impacts; formative and summative evaluations of large format (IMAX) films such as *Dinosaurs Alive* and *Wired to Win*; and documentary films such as *The Linguists*. RMC has also conducted evaluations for a wide variety of other informal science education programs, including radio series, television documentaries, curriculum support materials, children's television programs, and museum and science center exhibits. Key Personnel: *Alice Apley* is a cultural anthropologist, who applies her expertise in qualitative research methodologies to various types of program evaluation. As a Senior Research Associate at RMC Research Corporation, her evaluation work has included management of and participation in qualitative, quantitative and mixed-methods evaluations for museum, media, arts and community organizations. Alice has presented at the professional conferences of the Association of Science and Technology Centers, and Giant Screen Cinema Association's Lifelong Learning group; and published in the Center for the Advancement of Informal Science newsletter briefCAISE. She has been a panelist for NSF, NOAA, and NEH. Alice holds a Ph.D. from New York University.

**Teen Empowerment (TE)** is a Boston-based non-profit that inspires young people, and the adults who work with them, to think deeply about the most difficult social problems in their communities, and gives them the tools they need to work with others in creating significant positive change. TE's approach is the product of over 25 years of thoughtful experience in making institutions more effective, impacting the values, beliefs, and behaviors of youth and adults, and developing mechanisms for people of all ages to work together productively toward achieving their goals. Key Personnel: *Sapna Padte*, Director of Consulting & Training, has more than 15 years of experience in community organizing, youth development, and group facilitation. She spent two years as a Peace Corps volunteer in the West African island nation of Cape Verde developing health education materials. Upon returning to the U.S., Sapna worked in Brockton, MA at the Regional Centers for Healthy Communities, promoting youth development and asset building with youth programs and community agencies. She has been with Teen Empowerment since 2000. She received her BS/Biology degree from Rutgers University in 1994 and her Master in Public Health from Tulane University's School of Public Health and Tropical Medicine in 1997.

**The Encyclopedia of Life** project is a global partnership between the scientific community and the general public, with the goal of making freely available to anyone using the internet knowledge about all organisms on Earth. The EOL L+E group is headquartered at the Harvard

University Museum of Comparative Zoology (MCZ) and focuses on fostering collaborations and projects to develop tools and activities that leverage the authoritative content on the EOL main site for biodiversity awareness and learning. EOL brings together several of the world's leading natural history institutions, botanical gardens, and libraries.<sup>10</sup> Key Personnel: *James Hanken* is Director of MCZ, Alexander Agassiz Professor of Zoology, Curator in Herpetology. Dr. Hanken will oversee the EOL L+ E staff based at the MCZ who will develop and modify the web-based learning tools and learning modules for the grant. He holds numerous Board appointments, including as a member of the U.S. National Committee for the International Union of Biological Sciences. Honors include the von Hofsten Lecture (Uppsala University, Sweden), the Gompertz Lecture in Integrative Biology (University of California, Berkeley), and election as fellow of the American Association for the Advancement of Science. EOL L+E Director *Marie Studer* joined EOL in 2007. She coordinates and manages the outreach and partnerships to introduce EOL to educators and learners in all kinds of formal and informal education settings. Meeting with stakeholders across the country and around the world, she promotes awareness of EOL, engages various audiences in dialogues about the use of EOL in education and develops partnerships. In the ten years before she joined EOL, Marie was Chief Scientist for Earthwatch Institute, responsible for overseeing the research, education and conservation programs for this international citizen science organization. Marie earned her B.A., Chemistry at Wheaton College and her Ph.D. in Environmental Science at the University of Massachusetts Boston.

***The New England Ocean Science Education Collaborative*** (NEOSEC) is a diverse network of more than 40 science- and education-based organizations<sup>11</sup> across New England working to advance ocean literacy. NEOSEC has been instrumental in bringing the Ocean Literacy Principles to New England through its biannual Ocean Literacy Summit, a public outreach campaign to highlight the OL Principles in more than eight public sites around the region, and ongoing sharing of messaging and best practices among member institutions. Professionally developed communications products include an electronic newsletter (more than 1,400 subscribers) and a regularly updated blog sent to local, regional, and national networks of organizations and individuals. Members meet quarterly; there is an active committee structure. The following regional networks and multiple NOAA partners and entities send representatives to NEOSEC: the Sea Grant programs of Maine, New Hampshire, Connecticut; the Massachusetts Institute of Technology; the Wells, Great Bay, Narragansett Bay and Waquoit Bay National Estuarine Research Reserves; the Maine Coastal Program; and the Stellwagen Bank National Marine Sanctuary. In addition, NEOSEC maintains strong ties to its origins in the COSEE program, with COSEE Ocean Systems, the Central Coordinating Office for the National COSEE Network, and COSEE New England represented on the NEOSEC Governing Council. Key Personnel: *Pam DiBona*, NEOSEC Coordinator and Project Manager at the New England Aquarium (617-973-6566; pdibona@neaq.org), has served as network coordinator for NEOSEC since its founding, facilitating meetings, staffing committees, and managing day-to-day work to help the Collaborative fulfill its mission. She brings more than 20 years of experience in network, coalition, and partnership development and maintenance to this position, as well as a solid grounding in the science content (B.A., Biochemistry, Connecticut College; M.S. Environmental Science, University of Massachusetts, Boston). As project manager in the New

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<sup>10</sup> These include Harvard University, Biodiversity Heritage Library, The Field Museum of Natural History, Marine Biological Laboratory, Missouri Botanical Garden and Smithsonian Institution.

<sup>11</sup> See [neosec.org](http://neosec.org).

England Aquarium's Division of Programs, Exhibits, and Planning, Pam also directs and manages the NOAA-funded *Summer Science in New England*, and managed the Center for Ocean Sciences Education Excellence (COSEE) New England, including NSF reporting. This spring, Pam will complete a Certificate in Critical and Creative Thinking at University of Massachusetts Boston, with a program focus on public understanding of and participation in science. Communications Coordinator *Catherine Cramer* has written and edited numerous articles and papers on marine science and oceanography topics since 1997. She is also Communications Coordinator for the National COSEE Network and NEOSEC. In those roles, she edits two e-newsletters, a blog, and provides content for the national cosee.net and COSEE-NE websites.

### **Field Teams' organizational descriptions and key personnel**

#### **Seacoast New Hampshire Team**

***Seacoast Science Center*** The Seacoast Science Center provides exceptional learning experiences in the marine and environmental sciences through programs and exhibits. It serves 70,000 visitors annually with exhibits that interpret the area's history and habitats, including salt and fresh water aquariums. Nature programs are offered for all ages from 18 months through senior rediscovery. Lead Staff: Perrin Chick, Education Director, oversees the Center's educational efforts and staff.

***Portsmouth Housing Authority*** enhances the quality of life for Portsmouth residents through a variety of programs and services. In this project, families from the Gosling Meadows and Wamesit Developments will participate in the programs and evaluation. Both communities have recreation facilities that accommodate the needs of the families, and will be used as a center of activity for program development. Lead Staff: Emmanouella Vendouri, the Resident Services Coordinator for the Portsmouth Housing Authority has worked for the families of PHA Gosling Meadows and Wamesit Place Communities for the past seven years.

#### **Newburyport Massachusetts Team**

***BOAT CAMP*** (Building Ocean Awareness Through Children, Adults and Marine education Professionals) provides marine and environmental education programs for all ages that celebrate the diversity of the sea and inspire sound stewardship of the ocean through story and experience, both inside their ocean education center and aboard the *Erica Lee*. Located on the North Shore of Massachusetts, their hands-on programs serve approximately 600 kids and families each season in the greater Newburyport and Merrimack Valley region. Lead Staff: Kate Yeomans, Director.

***JumpStart Youth Connection, Inc.*** (JYC) is a nonprofit organization run by educators, social workers and philanthropists dedicated to providing academic, social and physical education opportunities to greater Lower Merrimack Valley Youth. Through after school programs and a summer camp, the organization provides tutoring, therapeutic art, social and academic enrichment, mentoring, physical fitness, cultural experiences and above all, an opportunity for middle-school- aged children and their families to overcome the obstacles that have made academic and social success seem beyond their reach. Lead Staff: James Queenan, MBA, MS, Med, JYC Co-Founder.

#### **Nahant, Massachusetts Team**

Situated on Nahant's historic East Point, the ***Marine Science Center*** (MSC) is Northeastern University's first class teaching laboratory. Surrounded by the waters of Massachusetts Bay, the MSC is a unique and ideal center for undergraduate and graduate research and education. The MSC is also home to an active and growing community outreach program, which targets

audiences of all ages in formal and informal settings throughout the year. Many programs are based on-site and involve participants in hands-on field activities. In addition to inspiring and engaging future marine scientists, the intended outcomes of the outreach program are enhancing knowledge, developing investigative skills, and fostering stewardship of the marine environment. Lead Staff: Carole McCauley, Outreach Program Coordinator, has an M.S. in Environmental Education, and possesses a rich background in community engagement and capacity building through environmental stewardship programs.

For over 66 years, *Girls Incorporated of Lynn* has responded to the changing needs of girls and their communities by providing essential developmental resources and challenging programs to high-risk, low-income girls and their families. Since its founding in 1942, Girls Inc. of Lynn has been widely recognized and respected for the powerful and positive impact it has had on generations of girls and women. Girls Inc. of Lynn is a part of a national youth organization. The organization is dedicated to inspiring all girls to be strong, smart and bold. With roots dating to 1864, Girls Inc. has provided vital educational programs to millions of girls, particularly those in high-risk, under served areas. Today, innovative programs, including those related to stewardship and natural environment, help girls confront subtle societal messages about their value and potential, and prepare them to lead successful, independent, and fulfilling lives. Lead staff: Maria Manzueta is the coordinator of programs serving girls in Grades 1-6, which includes after-school and summer offerings, as well as family events.

#### **Boston, Massachusetts Team**

*New England Aquarium's* family programs department currently serves children 12 months through 12 years old with adult-child learning opportunities both onsite and in the field. The path of ocean stewardship starts with inspiring experiences that create the motivation for acquiring further knowledge, skills and a sense of self-efficacy which ultimately leads to empowered and active stewards in the community. The goal for family programs is to inspire and inform participants and start them on their stewardship path while providing a quality family bonding experience. Lead Staff: Hannah Stinson is an Education Programs Coordinator at the New England Aquarium. She is responsible for maintaining smooth operations and designing high quality programming for families and groups. Her work includes supervising and scheduling program staff, maintaining relationships with clients, designing new programs, tracking program evaluation and using evaluation data to improve programs.

The *Chelsea Intergenerational Literacy Program (ILP)* is a project of the Chelsea Education Foundation (CEF). CEF supports the Chelsea Public School system. Since 1989, the ILP has provided free English literacy instruction to immigrant parents and caregivers and literacy-focused instruction to their children. By teaching parents with limited English proficiency to read and write in English in meaningful ways, the ILP encourages and models reading and writing in the home. The children's program makes it easier for parents to attend and stay in the program, while preparing their children for literacy. Lead Staff: Dr. Barbara Krol-Sinclair is Director of the ILP. She oversees instruction, staff hiring and training and learner intake and placement. Dr. Krol-Sinclair has published several articles and chapters on family literacy and has extensive experience in teaching, directing and evaluating English literacy programs in the U.S. and overseas. She will serve as the lead contact person for this project.

#### **Mystic Connecticut Team**

*Sea Research Foundation's* mission is to inspire people to care for and protect our ocean planet through education, research, and exploration. Sea Research Foundation is comprised of three distinct yet interconnected divisions: Mystic Aquarium, the Institute for Exploration, and

Immersion Learning. These divisions bring the wonders of the oceans to people across the country and around the world. Mystic Aquarium gives visitors an up-close look at many marine animals, including beluga whales, cownose rays, and Steller sea lions. Dr. Robert Ballard's Institute for Exploration delves into the deep oceans, discovering ancient shipwrecks, little known geological phenomena, and the roots of human civilization. Immersion Learning connects the Aquarium's programs with the deep-sea expeditions of the Institute to lead at-risk students across the country toward careers in math, science, and technology. Lead Staff: Kelly Matis, Vice President of Education & Public Conservation Programs at Mystic Aquarium. Ms. Matis oversees all education programs and staff at the Mystic Aquarium.

***Subase New London Child and Youth Programs*** (CYP) Military lifestyle offers unique challenges and opportunities for children whose parents are assigned to Naval Submarine Base New London. For this reason, special programs are developed to promote children and families' growth and development in a nurturing environment through meaningful learning experiences. CYP Programs provide numerous opportunities designed to inspire and enable all young people to realize their full potential as productive, caring and responsible citizens. Teams of caring, knowledgeable professionals plan developmentally-appropriate programs that are responsive to the unique needs, abilities and interests of our children and families. The CYP's before and after-school programs are accredited with the National After-School Alliance and are affiliated with the Boys & Girls Club of America. The summer program features the Drug Education for Youth (DEFY) Program sponsored and funded by the Department of Justice and the Drug Reduction Task Force. Lead Staff: Cathy Terrall, School Age Care & Youth Director, oversees all school age, youth and family programs at the Subase Youth Center.

#### **Dissemination plan**

Dissemination will be coordinated by the NEOSEC Coordinator and Communications Consultant to maximize impact of the dissemination activities and prevent duplication of effort among partners.

***Conferences and meetings*** During Year 2, presentations about the project and its impact will be given at professional meetings and conferences. NEOSEC membership meetings alone reach almost 40 institutions and networks around the region; two in-person meetings and two conference calls each year provide opportunities to share information among members. To reach a broader audience, in 2012 program partners will present the program approach and product at the National Marine Educators Association conference (Alaska) and New England regional NMEA conferences, the New England Museum Association Annual Conference (Hartford CT), the Tri-State Housing Authority Conference (Bartlett, NH), NERACOOS Annual Meeting (Rye, NH) and NEOSEC's 4<sup>th</sup> Biennial Ocean Literacy Summit (Boston MA). The first two OL Summits (in 2006 and 2008; 2010 Summit in preparation) each attracted more than 100 informal and formal educators, scientists, education policymakers, and science communicators.

***Electronic and Print Media*** NEOSEC hosts well-established and wide-reaching electronic and print tools for dissemination. Catherine Cramer maintains NEOSEC's associated blog and edits its monthly electronic newsletter *NEwswave* which reach 1,400 people nationwide. Further, NEOSEC's connection to the National Centers for Ocean Sciences Education Excellence provides an additional outlet for dissemination, through their website (cosee.net) and e-newsletter, COSEE Network News, edited by Ms. Cramer.

Ms. Cramer is also participating in a major redesign and expansion of NEOSEC's primary website (neosec.org) to reflect a new Memorandum of Understanding with NERACOOS, under

which NEOSEC will serve as that group's education and outreach partner. Funding from NERACOOS through August 2010 will ensure that the new website will be in place by September, providing important links to scientist-partners, as well as ample capacity to host an online platform for this program. This section of the website will not only facilitate cross-team collaboration and information-sharing among program partners, but will be visible to all website visitors. Additionally, project updates will be presented at appropriate NERACOOS meetings. Evaluation reports will be posted to [www.informalscience.org](http://www.informalscience.org) by RMC. Project findings will be submitted for publication in professional trade journals such as the *Journal of Environmental Education*, the *Journal of Experiential Education*, the Association of Science-Technology Centers' *Dimensions*, and Informal Learning Experiences Inc.'s *Informal Learning Review*. This work will be carried out primarily by Ms. Cramer, who has successfully placed articles about past NEOSEC work in *Science Scope* and regional newsletters, including those of the National Marine Educator chapters and the New England Science Center Collaborative.

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