

Spring 2016 Regional Coordinator Survey—Final Report

Introduction

The Consortium for Ocean Leadership annually implements the National Ocean Sciences Bowl as a regional and national, competition based program for high ability secondary students in the United States. Annually, an external evaluation has been funded and implemented to monitor the implementation of the program from the perspectives of the various stakeholders, including students, past-participants, coaches (high school teachers), regional coordinators, parents, scientists, and other volunteers. Beginning in 1998 at the inception of the NOSB and continuing since that year, Drs. Tina Bishop and Howard Walters have developed the surveys associated to this now longitudinal tracking study, as well as numerous other instruments and data collection procedures. This year, in Spring 2016, a revised survey was prepared and, with review and input from COL staff, disseminated to the Regional Coordinators, who are responsible for team recruitment, developing fiscal support, planning, and implementing all aspects of the regional bowls. The survey was distributed by COL, and 22 of the 26 Regional Coordinators submitted extensive responses to the electronic survey. Summary results are as follows.

Demographics

For this spring 2016 report, 22 of the 26 NOSB Regional Coordinators (RC) provided extended and complete responses to the survey items. Of this group, eight (36%) had served as RCs from 1-3 years, eleven for 4-10 years, two from 11-15 years, and one for more than 16 years. This represents a range of participation and perspective that contributes positively to the credibility of the survey responses. These individuals represent a variety of educational backgrounds, but were highly drawn from the biological sciences (12 individuals) and to lesser extents from education (2), physical sciences (2) or the social sciences (1). Other RCs responding reported themselves as university administrators, informal educators, or from other specific science disciplines that were contained within these larger categories.

Respondents were asked about their primary motivation to become an NOSB RC. The responses were varied, but reflected some consistency with regard to viewing it as a fun or exciting program, as a means of supporting science learning, and combined with their love of the ocean and ocean science. Others took on the position as graduate school outreach assignments, or inherited it from a previous RC as a work transition. One of the RCs reported that he/she participated as a student in high school and continued to work with the program. The RCs who responded to the survey represented primarily universities, and included:

- Youngstown State University
- Oregon State University
- Michigan Sea Grant
- University of Alaska Fairbanks
- Pittsburgh Zoo and PPG Aquarium
- MIT Sea Grant Contractor (People Making a Difference)

- George Mason University
- Jet Propulsion Laboratory
- University of Wisconsin-Milwaukee, School of Freshwater Sciences
- Rutgers University
- University of New England
- IDEXX Laboratories
- VIMS
- Stanford University, School of Earth, Energy & Environment
- University of Washington
- USM Gulf Coast Research Laboratory
- University of New Hampshire
- CIRES
- Connecticut Sea Grant/University of Connecticut
- Texas Sea Grant

Organizational Related Items

Items five through eleven provided opportunities for the respondents to consider their own respective organizations, and how these intersect with the operation of the NOSB in that location. For item five, respondents were asked to rate the level of awareness that their organization’s leadership had about the NOSB. Only six of the respondents indicated a High level of awareness, with an average response of 3.77 on a scale of 1-10 with 10 corresponding to the highest awareness level. This item response was very similar to that of item six, which attempted to gauge the organizational leaderships *interest* in the NOSB as a program. This item dropped to a mean value of 3.32, and only three respondents rated their leadership at the highest interest level.

Item seven asked respondents how, if awareness or interest were low, this situation might be changed. This item drew only twelve responses, suggesting that the respondents might not have viewed this as a necessary or troubling condition. One even noted that it really didn’t need work, as regardless of awareness or interest, there was support. A few responses were roughly in a cluster suggesting that in large organizations, higher level administration may never be fully aware of the reach of informal outreach programs. For those responses that seemed constructive, respondents suggested a heightened awareness of the recruitment opportunities (for universities) or other institutional benefits might raise overall organizational awareness.

Item eight asked “How does hosting the regional NOSB contribute to your organization’s mission and vision?” Among the responses, it seemed important to publicize the organizations’ research and programs/research. Responses tended to cluster around three general ideas:

- raising overall science content knowledge and awareness, either among participants or—at a mission level—as a part of overall community outreach efforts within informal science programs;
- seeing the NOSB as a pipeline recruitment tool to contribute to university efforts to recruit undergraduate and graduate students in the aquatic, marine

and ocean sciences, and connected to this, a sense of responsibility to recruit and create a “next generation” of scientists or other workforce development concerns; and

- the NOSB appears to create or catalyze partnerships among agencies, organizations and departments which may not generally have a context in which to partner.

One additional, very extended response, while not reflecting a cluster of respondents, nevertheless included several important elements. This RC noted that the work with high schools in the NOSB allowed his/her organization to enhance its outreach to underrepresented students and rural communities, thereby enhancing the overall diversity of its programming. This individual also noted the impact on high school classrooms themselves from having the participants and coaches engaged in this program.

Item nine sought to clarify the primary benefits to the *organization* from hosting the NOSB. There were a number of concrete ideas that were suggested in these responses, but a single, clear cluster of responses was also identifiable: numerous RCs viewed hosting the NOSB as an opportunity for recruitment of high ability secondary students into their university as a primary benefit of hosting, as well as the related idea of exposing these students to their programs and scientists. One select quotation captures this idea: “It is a good recruitment tool for the department. It also provides an opportunity for the scientists in the department to engage in outreach, which they enjoy.” This cluster of ideas suggests that over time, these organizations and RCs have realized success in this recruitment approach, and this is, in fact, substantiated in the tracking efforts and reporting for the past-participants. Many of those students have reported separately to the evaluation team that they obtained critical information about colleges and careers from contacts. They have also reported that by attending a regional bowl at a university campus, they are able to interact with these scientists (the “other side” of this quote) and that this personalizes that specific university program for them, and contributes to a decision to attend university there. This leveraging aspect of the NOSB is certainly a “value added” fiscal benefit to these university sponsors, which seems underestimated.

Finally, item ten asked if the RCs had had the opportunity to speak directly to their organization’s leadership about the benefits of the NOSB. Of the 22 respondents, eighteen (81%) indicated yes, and only four (18%) indicate no (losing a single percentage point in overall rounding error for this item).

Benefits of the NOSB Program

Items eleven through thirteen explored the potential benefits of the NOSB program as perceived by the RCs. Item eleven addressed the primary benefits of participating in the NOSB to the RC him/her self. The range of responses tended to cluster in four areas. First, several respondents described growth in their own professional skills because of coordinating the regional. These skills included leadership, communication, planning and logistics, and organizing programs. Other respondents described meeting new people, networking, making connections and

building relationships with different stakeholder groups. A third cluster was the enjoyment or fun and excitement of planning and seeing the NOSB operate. Finally, several respondents described the pleasure of working with high ability high school students as a primary benefit to themselves.

Item twelve asked respondents to describe the primary benefits of NOSB participation to the high school students. The RCs, who have a first hand knowledge from interacting with the students and their coaches regularly, identify specific, career inspiration linked to the immediate context of scientists and other professionals already engaged in those careers; networking with like-minded peers, college and graduate students and scientists; high-level content knowledge and enhanced understanding of science generally and the ocean sciences particularly; and an enhanced skill set that is transferable to college settings (study skills, leadership skills, team-building and self-awareness.) Several enlightening quotes emerged in the responses for this item:

- Opportunities to learn interesting and challenging, sometimes applied, knowledge about the oceans through organized programming that would otherwise be unavailable to them. Opportunities to meet and interact with people who are knowledgeable and enthusiastic about the ocean, as well as WHOI graduate students, other researchers, and people with other ocean-related careers.
- Introduces them to a great breadth and depth of information, really motivates some of them to dig deeply and take responsibility for their own learning. When you see kids a few years in a row, you can see how they are developing their team work and leadership skills (coaches definitely comment on this). And, they meet other students like themselves, interested in science, not afraid to achieve academically. While they don't have a lot of time to speak with the officials, many kids mention that meeting marine scientists is beneficial, some even say that they are flattered that so many professionals volunteer to make the Bowl possible.
- This is a great gateway into the many facets of marine studies.

The final item on benefits (question 13) asked RCs to identify possible benefits to the coaches (the high school teachers) from participating in the NOSB. Several respondents identified issues related to learning science: the teachers benefitted from NOSB because they used it as a means to enhance content learning, to motivate learning, or as a means to encourage self-directed content learning among their students. Two respondents noted the accessibility of career information that teachers are able to extract from NOSB. Finally, three respondents addressed in different ways the issue of professional development and networking among the teachers themselves because of the NOSB. Two select quotes from respondents that capture the essence of the information presented in this item are:

- For some, it provides a rationale they need with their school administrators to cover more marine science within their science curriculum. They can motivate their students to go more deeply into subjects during study and practice sessions. Many recognize the

competitive nature of their more motivated students and the Bowl provides opportunities. Some teachers we see every year have become friends and reach out to assist one another.

- For some of our coaches, it has served as a creative new way to integrate ocean science into their curriculum. For others, it has opened doors to other opportunities for teachers at our university. For example, one of our coaches found out about a University in the High Schools program and started offering a college level ocean science 101 in his high school. The kids got college credit, and get excited about ocean science.

Operational Questions

Items fourteen through twenty are associated to a variety of different operational questions regarding recruitment, volunteers, partners, and other elements related to actually carrying out the regional NOSB competitions.

Item fourteen asked respondents to comment on the most significant challenge they associate with serving as an RC and with running their regional competitions. Overwhelmingly, the single largest challenge cited was funding support for the program. A large majority of RCs point to funding reductions, and to a disparity between the funding provided and the time that that covers in their own time—compared to the time that they actually commit. Some RCs note that their organizations require them to find additional funding, or to use base-funding to cover the time. Beyond these, the other issues that emerge, but which may also in some ways relate to fiscal support, are the amount of time required to run the project, and finally, the challenge to recruit volunteers to cover the staffing needs.

Item fifteen asks “Please describe examples of ways that your local community is involved with your regional competition.” There was a wide variety of responses, but they seemed to focus on those traditional areas of volunteer support, donations for prizes, food, and various sponsorships, and other agencies, businesses, and organizations that co-staff or provide personnel for the various personnel needs of the program itself.

Further related to the funding issues, item sixteen asked respondents if they obtained external funding for their regional NOSB competition. Thirteen (60%) of the respondents indicated that they did. These individuals were then asked to provide the sources of this additional funding. These included:

- Donations in kind
- Funding for graduate students used as coordinators
- Marine related local businesses
- MathWorks
- JPL
- Local family foundations
- The host institution
- A local marine research institute
- University support
- Keesler Federal Credit Union, Mississippi Department of Marine Resources, MS/AL Sea Grant and Dauphin Island Sea Lab

- NH Sea Grant and ME Sea Grant

Item seventeen asked about any organizational support for fundraising for the NSOB regional competition. While five of the respondents indicated yes, they were provided support, seventeen (77%) of the respondents indicated that they were not given assistance in fundraising. Item eighteen asked if the organizations provided direct funding or in kind support for the NOSB competition, eliciting a positive response from fourteen (64%) of the respondents. In a follow-on item, the range of financial support reported by these RCs was from \$1,000 to \$35,000 from combined resources, covering such items as overhead, staff time, security, and a fairly comprehensive list of program needs. Clearly, there is a wide range of financial support contributing to a diversification of programming across the regional competitions. It is unclear, based on this current survey, whether this impacts the outcomes of the project, but this would seem to be an important follow-up question to resolve for the implementing organization.

Item nineteen asked “What ocean or science related groups or organizations participate in or assist with the regional NOSB?” The answers were wide-ranging and covered an exhaustive list of the federal science agencies, numerous state science related agencies, numerous university programs and research centers, as well as a selection of NGOs. Among the most occurring agencies or organizations, clearly NOAA and its line-offices and programs is highly represented, as are the various states’ Sea Grant College Programs. These agencies assist with volunteers, tours, field trips, training, and recruitment support, and in some cases provide direct fiscal support. Interestingly, in a follow-on question (item 20) regarding the participation of the National Marine Educators Association regional chapters in the regional NOSB competitions, only seven (32%) of the RCs responding to the survey indicated involvement by NMEA. Fully 68% of the RCs indicated that NMEA was not involved. This seemed counter-intuitive and seems to be a transition from the early years of the NOSB, but does reflect the involvement of a large group of RCs who are not, essentially, formally tied to ocean organizations. By name, the MAMEA, NAME, GOMMEA, and TMEA regional chapters of NMEA were identified by respondents. This specific observation offers an opportunity for NOSB regional staff to investigate this natural relationship between their regional NMEA chapters and their programs. As well, the national leadership of NMEA might be contacted by national NOSB personnel to investigate reinvigorating this relationship, as was the original design of the program.

Recruitment

Items 21 and 22 pertained to efforts and challenges in recruiting students. Clearly, from the responses, even though numerous RCs describe recruitment as a time consuming and difficult task, most individual responses suggest that at this stage, nearly two decades into NOSB implementation, the program is primarily self-sustaining from a personnel and volunteer perspective. Numerous regional sites have a large, stable group of returning teams year to year. Beyond this, email “blasts” and listservs are a predominant means of distributing information about the regional NOSBs, and frequently use common lists of high schools and teachers that

are shared by other programs in recruitment. Other RCs reported the use of word of mouth among coaches, and sharing at teacher conferences. One interesting and lengthy response from an RC described a systematic attempt to increase the diversity of the teams participating at the regionals, as well as intentional attempts to work with Tribal school systems to include those young people as well. Item 22 asked the RCs to rate the difficulty of recruiting schools, and again, the distribution demonstrated slightly more than half of RCs view recruitment as a difficult task, though this is perhaps perception based on the responses to the earlier item. Three interesting issues do surface in the open ended responses to the rating question: there is little incentive for coaches to participate with a team, and the difficulty in recruitment may be more associated with diversifying the pool of participating teams beyond the teams that have been participating for years. And finally, one respondent described the very large geographic region from which his/her regional bowl draws, and the lack of transportation or travel assistance to allow teams from distances to participate. Item 24 (note: this question was inadvertently inverted in its order in the survey and is clustered here in this report) asked the RCs to indicate the amount of time invested in recruitment. These responses ranged from 1-3 hours (18% of RCs), to 4-6 hours (14% of RCs), to 7-9 hours (14% of RCs) to 10 or more hours (55% of the RCs or 12 individuals). Given the reliance on email and web based communications, this last response rate seemed, high; however, in the open-ended descriptions of activities, it seems clear that included in these time estimates were time invested in creating posters and flyers, writing letters, updating web pages, and then outreach to potential new teachers, which required greater individual time investments. It is clear that recruitment involves extended marketing and public relations campaigns near-annually.

Changes and Concerns

The final three items related to concerns or criticisms that the RCs hear from their individual coaches about the regional and/or national competition, and further solicited input from the RCs on issues to change or refine.

Item 23, focused on concerns or criticisms, produced the least consistent set of responses across the survey. While there were incidental references to food, quality of volunteers, space or costs, and a few technical concerns about the bowl implementation, there were no clusters of concerns that seemed essential or actionable. Nevertheless, the evaluation team encourages the NOSB national office staff to review the individual responses for these three items to identify any responses which may reinforce or guide overall consideration of the program moving forward.

Item 25 asked if the program might be revised to make the use of RC time more efficient moving forward. Again, it was not clear that there was a uniform cluster of actionable ideas in the responses. Certainly, several individuals expressed concerns regarding the amount of time invested in seeking fiscal support for programs, but this is ubiquitous in informal science education. There were three comments that pertained to teachers not providing complete and correct data in registration forms for the bowls, and two specific references to the Constant Contact registration software. It seemed, however, that these were offsetting comments,

and the clearest interpretation to this issue seems related to care and accuracy among coaches in filling out the forms and information. One respondent did raise the issue of the timing of the notification of the dates for the regional bowl, and this issue has been observed in previous years. Again, the evaluators encourage the NOSB national staff to review these response data.

Item 26 asked RCs to identify any areas to change in NOSB to make the program more impactful to students. From the range of responses, it seems that many of the ideas are highly actionable, but only at the regional level and with little opportunity, short of significant advances in the funding structure, for the overarching national program to contribute. Among these ideas were expanded opportunities for students to learn about specific careers, contact with professionals in STEM areas and perhaps follow-up events such as career fairs or contact with scientists—all seem reasonable at the regional level and would perhaps best be planned at that level. One respondent framed this well by noting, “I honestly don’t know. What do the students think has an impact for them?..NOSB has added quite a few programs for coaches and students over the years. “ Another area that was mentioned was additional activities for teams once they had been eliminated from the competition; and again, this seems most actionable at the regional level and contingent upon local resources. One unanswered issue is the role and value of media coverage and local school awareness at the local, regional, and national levels. The value of this coverage at the front and back-ends of the program should be investigated.

Finally, item 27 solicited ideas for additional activities that RCs have programmed at their respective regional bowls. While there were few clusters of common activities, other than lab tours or field trips to locally relevant outdoor spaces, the ideas mentioned included a sleepover at the aquarium; a second, invitational regional bowl that the coaches have developed and run themselves; and a research paper competition that adds points to the overall team during competition.

Summary and Conclusions

Since 1998 and continuing annually, the evaluation team has periodically explored with these regional coordinators their roles in the program and the opportunities, challenges and benefits that they have encountered along the way. There has been, and continues to be a deep commitment to the NOSB program—whether because of deep interest in ocean content, or a deep commitment to impacting secondary students through a high level academic competition. These RCs clearly obtain little off-setting benefit compared to the work load associated to the regional NOSB competitions, but are clearly not seeking that through their NOSB work. They view the program as a long-term, stable program that allows them to meet the visions and missions of their respective organizations. They perceive that students and teachers enjoy the program, and have developed connections over the years as a social community. This is a perception shared by those high school teachers and the students as viewed in other surveys of the program.

The RCs have been impacted by the evolving fiscal models for support for the NOSB over the years. Consequently, many of them commit noteworthy time in

seeking external fiscal support, and many of them have organizations that backstop them on this by helping find this support, or by providing it locally. Nevertheless, this seems to result in a highly disparate funding level across the programs and this should be studied carefully. One respondent describes intentionality in identifying a diverse audience, and this has been a strategic goal of COL and NOSB over the years. But, to the degree that highly disparate levels of funding, and the programs such funding allow and sustain, have emerged—and are known and shared among the RCs and coaches—the social stability of the program and its inclusivity presents a challenge to sustainability and equity, and should be further investigated.

Finally, as observed in surveys and data collection with other stakeholder audiences, the NOSB has indeed evolved into a durable and highly valued social network by the individuals who participate. From previous participants who now serve as volunteers and even, in this report, as a regional coordinator and coaches, to the scientists and agency personnel who annually volunteer, make donations or funding allocations available—the NOSB has moved beyond a program to an association or system in profound ways and can be studied and described in those terms.

Opportunities for Future Research

From the perspective of the data in the current survey, but also further contextualized from the series of ongoing reports from data collected on other NOSB stakeholder groups, it seems clear that continued opportunities to dig more deeply into the impacts and opportunities surrounding the NOSB system remain. From this current set of RC responses, the following seem to be important avenues for consideration of next steps in this research and evaluation path.

1. As new RCs have transitioned into leadership with the regional competitions over the past several years, and again as evidenced in these current data, their ranks are increasingly filled by younger STEM career professionals, graduate students assigned to outreach work, science educators or scientists with a vision for outreach education as a responsibility of their positions. Many of these individuals express the idea that coordinating NOSB is perhaps an early career effort on their part, and through which they are developing program management skills. It seems likely these individuals will continue to evolve in their professional roles and responsibilities—and certainly this aspect to the program has been overlooked across the past two decades of evaluation tracking. It is recommended that the pool of current and past Regional Coordinators be considered for deeper analysis on the role of career development through program management and informal education and outreach efforts. This pool of increasingly experienced ocean education managers has a unique perspective, having worked across a number of stakeholder groups of interest to the federal STEM community, and should be studied carefully.
2. It is clear that the universities attached to the regional NOSB programs have directly benefitted from access to and recruitment of high ability participants in the NOSB programs at or in conjunction with their campuses. Given the pressure for fiscal support for the NOSB program, careful attention should be given to develop metrics for the fiscal benefit to these universities from the pipeline of NOSB participants they attract. Cost leveraging from reductions in recruitment expenses

may be one possibility for developing additional fiscal supports for NOSB at the regional levels.

3. Finally, occasional references across the survey responses, and again in this one, suggest some benefit to local schools and regional sites from media exposure, and some use of media for developing awareness of the program at each of its levels, from local high schools to the national competitions. It is recommended that NOSB national program staff continue to monitor and review its planned efforts, and coordinating activities, to assist local high schools, individual students, and regional sites with issues of media exposure, and to consider the benefits which may occur from this exposure.

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