**Market Analysis Report**

*Results on the educational program landscape in the Bay area for the SF Bay NERR*

Submitted by:

Hannah Cullen

Volunteer Professional

**Executive Summary**

The SF Bay NERR conducted a study to determine what the science education program and professional development landscapes look like in the Bay area, while also considering the impacts of being virtual. Through online research and an online survey, the market landscape, challenges, and potential areas of opportunity were identified and are laid out in this report. Overall, most programs are geared towards students and are offered by non-profit organizations. It was found that programs primarily reach a few counties of the Bay area, but all audiences have at least a quarter of programs offered virtually.

It was found that most programs are geared towards upper elementary school students, and it is anticipated the demand for student programs across all grade levels will grow. Most programs are field trips and camps, yet it is anticipated that demand for virtual classroom lessons and at-home programs will increase. Student programs cover a wide range of topics, but mainly touch on conservation and stewardship, and animals. There are far fewer offerings available for educators, but availability was similar across all grade levels, and it is anticipated the demand for professional development and virtual resources will increase. Most programs offered to educators cover how to teach science, and various aspects of water. When looking at programs offered to the public, most were found to be geared towards adults and families, and were mostly volunteering opportunities, series, and events. These programs cover various topics with the vast majority focused on animals.

This study also looked to see what the program experience and demand is like for virtual participants and lower income learners. Students, teachers, and the community all have access to virtual programs, where a quarter of offerings per audience are available virtually, and nearly half of the market survey respondents expect to create or expand programs to be virtual in the next few years. Survey responses show that virtual programs cannot truly replace hands-on learning, and that it has been hard to keep both students and teachers engaged in a virtual environment. Additionally, having access to technology was a challenge noted that can be assumed to hit lower income learners the hardest. With challenges come opportunities, and it was found there are many opportunities for improving programs to attract participation, from having programs geared towards underrepresented and underserved students, to providing funding for teachers, to ensuring public programs get people the outdoor time they are looking for.

**Introduction**

**Description & goals**

With the rollout of the Next Generation Science Standards (NGSS) in 2013 and the shift to virtual learning in 2020, the San Francisco Bay National Estuarine Research Reserve (SF Bay NERR) is conducting a two-part analysis of current professional development opportunities for educators and education program offerings to Bay Area schools and the public around local estuaries and environmental science.

In the first part of this broader analysis, a market analysis was conducted by a volunteer professional, which involved independent online research and an electronic survey. The goal of the market analysis is to identify what the market is offering today in terms of program topics, program types and audiences addressed. This will also provide the ability to identify opportunities for partnerships, filling in offering gaps to meet market needs and demand, and ensuring programs aren’t replicated and over-saturate the market.

**Research questions addressed**

* What does the science education program landscape in the Bay area look like?
* What does the market in the Bay area look like in terms of teacher and informal educator professional development programs?
* What is the virtual experience and lasting impacts to education offerings and teacher demand?
* What are the conservation and stewardship education offerings in the market?
* What is the market experience and impact to lower income learners?

**Sample and Response Rate**

The market analysis began with a review and refresh of organizations in the Bay area that are known to offer science education programs and professional development. Working from the list of 45 known organizations from the 2011 market analysis, 5 additional organizations were added by the SF Bay NERR team. The data used was compiled from online research of the 50 identified organizations and survey results from the 13 respondents. Online research of the 50 organizations identified 108 programs for students, 18 programs for teachers and educators, and 44 programs for the public. Additionally, 57 other educational resources were identified as being available on the organization’s website.

**Results**

**Current landscape**

**Areas Served**

The question posed in the survey specific to geographic locations served was: Please tell us about the areas you serve. Which county or counties do you primarily serve? Are there additional areas that your current programs reach, including virtually?

It was found that the market mostly serves Alameda and Contra Costa counties, followed by Marin and Santa Clara.

|  |  |
| --- | --- |
| **Areas Served** | **Number of Responses** |
| Alameda | 8 |
| Contra Costa | 8 |
| Marin | 7 |
| Santa Clara | 7 |
| San Francisco | 6 |
| Sonoma | 6 |
| San Mateo | 6 |
| Napa | 3 |
| remote-anywhere | 3 |
| Solano | 3 |
| San Mateo | 2 |
| Bay Area | 1 |
| Petaluma | 1 |
| Monterey | 1 |
| Some reach out-of-state | 1 |
| statewide | 1 |
| Santa Cruz | 1 |
| **Grand Total** | **65** |

While there are many programs offered in-person, 31 student programs, 4 educator programs, and 15 community programs are available virtually, extending their reach outside of the Bay area.

|  |  |  |  |
| --- | --- | --- | --- |
| **Program Type** | **Number Student Programs** | **Number Educator Programs** | **Number Public Programs** |
| In-person | 68 | 6 | 29 |
| Virtual | 31 | 4 | 15 |

**Program Demand**

**Audience**

In the survey, it was asked how organizations anticipate demand and interest will change in the short term, based on market change over the past year.

It was found that program demand is anticipated to increase for all grade levels of students, as well as elementary educators, and potentially adult learners. It was also found that the market does not anticipate a change in demand for undergraduate students or middle and high school educators.

|  |  |  |  |
| --- | --- | --- | --- |
| **Anticipated Demand Change by Audience** | **Increase\*** | **No Change** | **Decrease\*** |
| Early elementary (K-2) students | 6 | 4 | 2 |
| Upper elementary (Gr 3-5) students | 7 | 2 | 3 |
| Middle school (Gr 6-8) students | 6 | 4 | 2 |
| High school students | 6 | 3 | 3 |
| Undergraduate college students | 2 | 7 | 1 |
| Elementary school teachers | 5 | 4 | 2 |
| Middle School teachers | 3 | 6 | 1 |
| High school teachers | 4 | 5 | 1 |
| Adult learners | 5 | 5 | 2 |

*\*Increase is a combination of greatly increased and slightly increased responses. Decrease is a combination of greatly decreased and slightly decreased responses.*

From market research, it is clear there are many more programs geared towards students available than there are for educators and the community. Of the programs geared towards students, 3rd graders had the most offerings, but this volume was similar across all grade levels K-12. There are not many offerings geared towards undergraduates currently available.

|  |  |
| --- | --- |
| **Grade Level** | **Number of Programs** |
| K | 23 |
| 1 | 25 |
| 2 | 26 |
| 3 | 38 |
| 4 | 36 |
| 5 | 37 |
| 6 | 33 |
| 7 | 30 |
| 8 | 30 |
| 9 | 35 |
| 10 | 34 |
| 11 | 34 |
| 12 | 33 |
| Undergrad | 6 |

When looking at the programs geared towards teachers and educators, teachers at any grade level had a similar number of programs available. There were a minimal number of programs specifically stated to be geared towards informal educators and for undergraduate college educators.

|  |  |
| --- | --- |
| **Audience** | **Number of Programs** |
| Elementary (K-5) teachers | 8 |
| Middle school (grades 6-8) teachers | 9 |
| High school (grades 9-12) teachers | 8 |
| Informal educators | 3 |
| Undergraduate college educators | 1 |
| Beginning professionals | 2 |
| Other/Teachers in general | 2 |

The majority of public offerings did not specifically mention their intended audiences; however, it can be gathered that most programs are geared towards adults and families.

|  |  |
| --- | --- |
| **Assumed Audience\*** | **Number Public Programs** |
| Adults | 16 |
| All | 7 |
| Families | 7 |
| Kids | 4 |
| Teens | 2 |
| Unknown | 8 |
| **Grand Total** | **44** |

*\*Assumed audience based on volunteer professional’s impression of audience during online research.*

**Types of Programs**

In the survey, it was asked how the market anticipates demand and interest will change in the next couple years.

It was found that demand will increase for many types of offerings, including virtual classroom lessons, in-person field trips, professional development, curricular materials, virtual resources, and activities outside of school. Overnight and day camp demand is expected to remain the same.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Anticipated Demand Change by Type** | **Increase\*** | **No Change** | **Decrease\*** | **Varies Too Much To Say** |
| Virtual, live-stream classroom lessons | 8 | 2 | 1 | 1 |
| In-person field trips | 6 | 0 | 3 | 3 |
| Overnight Camps | 1 | 5 | 3 | 3 |
| Day Camps | 4 | 3 | 3 | 3 |
| Professional Development | 9 | 2 | 1 | 0 |
| Curricular materials and/or lesson plans aligned to NGSS | 7 | 5 | 0 | 0 |
| Virtual resources (activity sheets, videos) | 10 | 2 | 0 | 0 |
| Activities to be done with parents/outside of school hours | 9 | 1 | 0 | 2 |

*\*Increase is a combination of greatly increased and slightly increased responses. Decrease is a combination of greatly decreased and slightly decreased responses.*

The most common type of student programming offered is field trips, followed by camps (day, overnight, school breaks).

|  |  |
| --- | --- |
| **Student Program Type** | **Number of Programs** |
| Field trip | 36 |
| Camp | 12 |
| Internship | 7 |
| Classroom | 6 |
| Learning unit | 6 |
| Other | 9 |

Educator program types vary, with the most common tied between workshops, and institutes and academies.

|  |  |
| --- | --- |
| **Educator Program Type** | **Number of Programs** |
| Workshop | 5 |
| Institutes & academies | 5 |
| Other (program, course) | 6 |

Programs for the public are also diverse in type, with the most common programs being volunteering opportunities, series, and special events.

|  |  |
| --- | --- |
| **Public Program Type** | **Number of Programs** |
| Volunteering | 7 |
| Series | 7 |
| Events | 7 |
| Classes & workshops | 5 |
| App/website | 4 |
| Trips | 3 |
| Challenges | 2 |
| Other (programs, visitor center) | 8 |

**Types of organizations**

Of the 50 organizations researched, half are non-profits, and over a quarter are tied to the government (government protected lands, districts doing work for local government, government agencies).

|  |  |  |
| --- | --- | --- |
| **Organization Type** | **Number of Orgs** | **% of Total** |
| Non-profit orgs | 25 | 50% |
| Government protected/run/funded | 16 | 32% |
| Aquarium/Zoo/Museum | 6 | 12% |
| Educational institution | 3 | 6% |

**Topics Covered**

There are a range of topics covered across the 108 student programs, with the most common topic being stewardship & conservation (water, land, habitat, etc.), followed by animals (birds, fish, marine mammals being most common), and then ecology & ecosystems.

|  |  |
| --- | --- |
| **Student Program Topics** | **Number of Programs** |
| Conservation & stewardship | 21 |
| Animals | 18 |
| Ecology & ecosystems | 14 |
| Water | 10 |
| Watersheds | 10 |
| Wetlands | 9 |
| Leadership skills | 8 |
| Habitats | 5 |
| Tidepools | 5 |
| Biodiversity | 4 |
| Climate Change | 4 |
| Environmental education | 4 |
| Marshes | 3 |
| Data sourcing | 2 |
| Deltas | 2 |
| Environmental justice | 2 |
| Food webs | 2 |
| Internship & job skills | 2 |
| Ponds | 2 |
| Tidal actions & low tide | 2 |
| Other\* | 12 |

*\*Other topics addressed by 1 program include: Bay mudflats, Baylands adaptations, creeks, marine science, networking, ocean acidification, open bay, local plants, Pt. Reyes peninsula and seashore natural history, rocky shore, science practices, and sustainability.*

Programs geared towards teachers and informal educators have many less topics, but the most common was teaching science (some cover alignment to NGSS), followed by water (science, resources), and stewardship & conservation (water, land, habitats).

|  |  |
| --- | --- |
| **Educator Program Topics** | **Number of Programs** |
| Teaching science | 5 |
| Water | 4 |
| Conservation & stewardship | 3 |
| Oil spills & pollution | 2 |
| Other\* | 7 |

*\*Other topics addressed by 1 program include: citizen science, food webs, leadership, tidal action, watershed, wetlands, and environmental education.*

The most common topics seen in programs available to the public are animals (birds, fish, marine mammals), conservation & stewardship (of animals, estuaries, lands), and ecology and ecosystems (Baylands, marshlands, intertidal habitats).

|  |  |
| --- | --- |
| **Public Program Topics** | **Number of Programs** |
| Animals | 16 |
| Conservation & stewardship | 7 |
| Ecology & ecosystems | 5 |
| Climate change | 3 |
| Data sourcing | 3 |
| Watersheds | 3 |
| Wetlands | 3 |
| Marshes | 2 |
| Plants | 2 |
| Tides & low tide | 2 |
| Other\* | 9 |

*\*Other topics addressed by 1 program include: Baylands, creeks, delta systems of the bay and river, environmental science, local waterways, ocean acidification, ponds, rocky shore, and tidepools.*

**Challenges**

In the survey, organizations were asked what new program offerings they hoped to develop in the coming years. Nearly half of survey respondents mentioned the creation or expansion of programming to be virtual, and a few noted partnerships and professional development offerings. *[Full responses to survey question 10 can be found on pages 16-17 in the appendix.]*

Organizations were also asked in the survey what challenges they encountered in offering education programs during the pandemic. More than half of respondents said not being hands-on and in the field was a big challenge, where virtual learning couldn’t be a substitute. Nearly half of responses also mention challenges with keeping students and teachers engaged, as well as issues with technology and lack of technological access. It can be gathered these impacts are most likely felt the strongest by lower income learners. *[Full responses can be found on page 17-18 in the appendix.]*

An anecdotal challenge noticed while doing online research on programs is the changing public health restrictions from the COVID-19 pandemic. Throughout the research process, it was observed organizations were updating what programs were offered, and how they were offered, as well as plans on what may be available. Because of the pandemic, programs are changing and evolving from how they are offered (in-person or virtually), to the number of programs available at all, which may mean topics and audiences addressed may change and be different at any given time.

**Opportunities**

**What attracts schools to education programs for students**

The survey asked how important certain elements of educational offerings were in driving teachers and schools to participate.

For K-5 students, it was found that alignment to NGSS, hands-on learning, inquiry-based offerings, being directed towards underserved learners, and locally based programming were all very important. Other elements that were considered somewhat or a little important were having materials that could be used over again, problem-based offerings, volunteering components, being customizable, and having hybrid options.

|  |  |  |  |
| --- | --- | --- | --- |
| **Elementary (K-5) Program Elements** | **Very Important** | **Semi-Important\*** | **Not Important** |
| Alignment to NGSS | 9 | 4 | 0 |
| Materials that can be used over again | 6 | 7 | 0 |
| Hands on activities | 12 | 1 | 0 |
| Problem or project-based activities | 5 | 8 | 0 |
| Inquiry based activities | 9 | 4 | 0 |
| Volunteer/service-learning activities | 4 | 6 | 0 |
| Geared towards underrepresented or underserved communities | 8 | 5 | 0 |
| Locally based programming | 9 | 4 | 0 |
| Customizable | 5 | 8 | 0 |
| Hybrid components | 3 | 7 | 2 |

*\*Semi-important includes ‘somewhat important’ and ‘a little important’ responses.*

For students in grades 6-12, it was found that alignment to NGSS, hands-on learning, problem-based offerings, inquiry-based offerings, geared towards underserved students, and locally based programs were all very important. Other elements that were considered somewhat or a little important were having materials that could be used over again, volunteering components, being customizable, having hybrid options, political components, leadership skill building, and college-prep components.

|  |  |  |  |
| --- | --- | --- | --- |
| **Middle & High School (6-12) Program Elements** | **Very Important** | **Semi-Important\*** | **Not Important** |
| Alignment to NGSS | 6 | 4 | 0 |
| Materials that can be used over again | 3 | 7 | 0 |
| Hands on activities | 8 | 2 | 0 |
| Problem or project-based activities | 8 | 2 | 0 |
| Inquiry based activities | 8 | 2 | 0 |
| Volunteer/service-learning activities | 4 | 7 | 0 |
| Geared towards underrepresented or underserved communities | 8 | 3 | 0 |
| Locally based programming | 9 | 2 | 0 |
| Customizable | 4 | 5 | 1 |
| Hybrid components | 3 | 4 | 0 |
| Political/regulatory components | 0 | 9 | 1 |
| Leadership skill building component | 4 | 8 | 0 |
| College prep/mentorship | 3 | 7 | 0 |

*\*Semi-important includes ‘somewhat important’ and ‘a little important’ responses.*

Specific to undergraduate college students, the elements found to be very important were hands-on learning, problem-based offerings, inquiry-based offerings, locally based programs, leadership skill building, and providing internship experience. It was found that having materials that could be used again, volunteering offerings, geared towards underserved students, being customizable, hybrid offerings, and political components were somewhat or a little important.

|  |  |  |  |
| --- | --- | --- | --- |
| **Undergraduate College Program Elements** | **Very Important** | **Semi-Important\*** | **Not Important** |
| Materials that can be used over again | 1 | 3 | 3 |
| Hands on/lab activities | 5 | 2 | 0 |
| Problem or project-based activities | 7 | 0 | 0 |
| Inquiry based activities | 5 | 2 | 0 |
| Volunteer/service-learning activities | 4 | 3 | 0 |
| Geared towards underrepresented or underserved communities | 4 | 4 | 0 |
| Locally based programming | 5 | 3 | 0 |
| Customizable | 3 | 4 | 0 |
| Hybrid components | 3 | 4 | 0 |
| Political/regulatory components | 3 | 4 | 0 |
| Leadership skill building component | 5 | 3 | 0 |
| Internship/co-op/employment component | 6 | 2 | 0 |

*\*Semi-important includes ‘somewhat important’ and ‘a little important’ responses.*

**What attracts teachers to professional development programs**

The elements found to be most important in attracting interest to professional development opportunities were offering a stipend, the educator’s general interest in science, and the educator’s interest to learn more science content. Other elements found to be somewhat or a little important were providing continuing education credits (CEUs), being offered virtually, and being aligned to NGSS.

|  |  |  |  |
| --- | --- | --- | --- |
| **Educator Program Elements** | **Very Important** | **Semi-Important\*** | **Not Important** |
| CEUs offered | 2 | 8 | 1 |
| Virtual option | 4 | 7 | 0 |
| Stipend/funding | 6 | 5 | 1 |
| Aligned to NGSS | 3 | 7 | 1 |
| General interest in science | 5 | 5 | 0 |
| Interest to learn more science content | 5 | 6 | 0 |

*\*Semi-important includes ‘somewhat important’ and ‘a little important’ responses.*

**What drives participation in offerings geared towards the public**

The most important elements were found to be being kid-friendly and being held outdoors. Other somewhat or little important elements were being held over the weekend, having an opportunity to interact with experts, and skill-building components.

|  |  |  |  |
| --- | --- | --- | --- |
| **Public Program Elements** | **Very Important** | **Semi-Important\*** | **Not Important** |
| Interaction with scientists/research faculty | 3 | 8 | 1 |
| Events taking place over the weekend | 5 | 6 | 1 |
| Kid-friendly | 5 | 4 | 1 |
| Skill building (e.g. data analysis, species identification) | 4 | 8 | 0 |
| Spending time outdoors | 8 | 4 | 0 |

*\*Semi-important includes ‘somewhat important’ and ‘a little important’ responses.*

**Appendix**

**Responses to Open Ended Questions**

|  |  |
| --- | --- |
| **Responding Organization** | **Q.2 Please tell us about the areas you serve. From which county or counties do participants in your programs primarily reside? Are there people from additional geographic areas that your current programs reach, including virtually?** |
| Save the Bay | Alameda;Contra Costa;Marin;San Francisco;San Mateo;Santa Clara |
| Gulf of the Farallones National Marine Sanctuary | Alameda;Contra Costa;Marin;Napa;San Francisco;San Mateo;Sonoma;Some reach out-of-state, but primarily San Francisco, Marin, and Sonoma |
| Petaluma Wetlands Alliance | Sonoma;We focus on Petaluma schools. |
| The Watershed Project | Alameda;Contra Costa;San Francisco |
| East Bay Regional Parks/Big Break Visitors Center | Alameda;Contra Costa |
| Environmental Volunteers | San Mateo;Santa Clara;Our formal school programming with our live programs is targeted at San Mateo and Santa Clara counties, but anyone is welcome to participate in our Homeschool and Community programs, and any school (from any county) is welcome to participate in our virtual programs |
| Kids for the Bay | Alameda;Contra Costa;We can offer Blue Watershed Classrooms remotely to teachers around the bay and beyond. |
| California Coastal Commission | Alameda;Contra Costa;Marin;Napa;San Francisco;San Mateo;Santa Clara;Solano;Sonoma;statewide |
| Solano Resource Conservation | Solano |
| Cordell Bank National Marine Sanctuary | Bay Area in general but nationwide and somewhat international |
| Richardson Bay Audubon Center and Wildlife Sanctuary | Marin |
| The Marine Mammal Center | Alameda;Contra Costa;Marin;Napa;San Francisco;San Mateo;Santa Clara;Solano;Sonoma;Outside of COVID times, we are open to the public and have a range of school groups engaged in our work. During covid, we have seen a reduction in that but still offer virtual programs for any geography |
| Don Edwards National Wildlife Refuge | Alameda;Contra Costa;Marin;San Mateo;Santa Clara;Sonoma;Monterey, Santa Cruz |

|  |  |
| --- | --- |
| **Responding Organization** | **Q.1 We will ask about programs you currently offer teachers and K-12 students, as well as the public (adult learners). We are particularly interested in programs that focus on estuaries and environmental science. Please note that “teachers” in this survey also includes informal science/outdoor educators. Please list up to 10 programs with which you are currently involved.** |
| Save the Bay | Bay Discovery Field Trips, Virtual Tidal Marsh Tours, Outdoor Learning Online |
| Gulf of the Farallones National Marine Sanctuary | 1) Virtual Marine Science Programs (K12): replaces our in-person field trips to the Greater Farallones National Marine Sanctuary Visitor Center 2) Virtual Fisherman in the Classroom (7-12): brings local fishermen into virtual classroom to talk about the history relevance of commercial fishing in Central California 3) Virtual Exploration of Rocky Intertidal and Sandy Beach Ecosystems (6-College): replaces Limpets: Long-term Monitoring Program & Experiential Training for Students 4) Virtual Oceans After School (K-5): provide 9 sessions of after school science enrichment 5) Virtual Marine Science Explorers Camp (4-6) for summer and school breaks  6) Biannual Virtual Soiree (public): evening science lectures 7) Annual Virtual Sharktoberfest (public/families): a celebration of the return of white sharks to the Farallones 8) Virtual sanctuary explorations (public): Virtual tours of the Farallones sanctuary 9) Virtual family workshops (families): on hold since January 2021 |
| Petaluma Wetlands Alliance | 3rd grade classroom and field trip combination, Bird and Nature Walk for public on Saturdays, Docent Development, Kiosk Posters as Interpretive Center. |
| The Watershed Project | The Watershed Project, as outdoor educators and guest teachers, offers K-12 watershed education programming students mostly in the West Contra Costa county area, though we have a longstanding partnership with SFUSD. Our K-2 program is called "The Water Around Us", and mostly focuses on students building a relationship with water and forming an understanding of the different bodies of water in nature. Our 3-5 grade program is called "Me and My Watershed", which introduces the concept of a watershed and how water moves through a watershed into the bay. Students discuss the impacts of water moving through urban settings and what water can pick up along the way to the bay. Students also discuss way the estuary is important for the community. Students also review the concepts of ecosystems and biodiversity. Our 6-8th grade program is called "Our Ecosystem, Our Community", which focuses on green infrastructure in urban watersheds and the benefits it has on the bay ecosystem in terms of lowering the impact of pollution in the bay among other things. Our 9-10th grade program is called "Ocean Acidification and Resilience" and it focuses on ocean acidification, bay acidification and climate and community resilience. Students conduct labs that demonstrate the effects of CO2 in the ocean as well as the impacts on organisms (oyster shells and vinegar are used in one of the labs). We are currently working on another high school program that will be piloted in the 2021-2022 school year, which focuses on climate change, green infrastructure and environmental justice. |
| East Bay Regional Parks/Big Break Visitors Center | Public Program Descriptions  Kids (5-12) and their grownups - hands-on activities and games to learn about the following: Our Wonderful Wetlands (June) - wetland definition, wetland ecosystem services and protection. Swimming Salmon Cycles (July) - watershed definition, watershed supports salmon life cycles, and protection. Big break Mammals (August) - wetland definition + wetland adaptations  School Program Descriptions   Kindergarten - Creatures of the Wetland  Program Description: Discover why many different animals live at Big Break! Students will learn that all creatures have basic needs to live and grow, while they explore how some of the wetland residents find food and shelter in this watery habitat.  NGSS - K-LS1-1, K-ESS3-1, K-ESS3-3  Length: 30 min (virtual) & 1 hour (in-person)   First Grade - Big Break Bodies  Program Description: Wetlands are lands that are wet and Big Breaks animals have special body parts that help them live and grow in this habitat. Students will discover how wetland residents use their bodies to find food and then they will be challenged to solve their own engineering problems by mimicking the animals at Big Break.  NGSS - 1-LS1-1  Length: 30 min (virtual) & 1 hour (in-person)   Second Grade Wetland Plant Safari  Program Description: Join the plant safari and discover the incredible diversity of Big Breaks flora! Students will learn that wetlands are home to many different kinds of plants because of the variety of habitats they offer - And then, students will create their very own Big Break plant and learn how to protect it.  NGSS - 2-LS4-1  Length: 45 min (virtual) & 1 hour 15 min (in-person)   Third Grade - Hootin Habitats   Program Description : Did you know that owls protect our homes and our food? Students will dissect owl pellets and discover how these wonderful birds provide pest control through their hunting habits. Students will also find out that we can help owls by protecting safe spaces like Big Break that they need to live and grow.  NGSS - 3.LS1.1 & 3-LS4-4  Length: 45 min (virtual) and 1 hour 15 min (in-person)   4th & 5th Grade - Little Levees, Big Breaks   Program Description: From habitat diversity and drinking water to agriculture and industry, the Delta is a California life force but this life force needs help. Students will discover the regions complex history and work together to define current problems and generate feasible solutions to improving the Deltas infrastructure through hands-on models and activities.  NGSS - 3-5-ETS1-1, 3-5-ETS1-2, 3-5-ETS1-3  Length: 1 hour (virtual) & 1 hour 30 min (in-person) |
| Environmental Volunteers | We have 2-3 environmental subject area programs for each grade K-5 (see https://www.evols.org/school-programs/) - both in-person lessons, field trips, and online synchronous lessons. We also have a Homeschool Program which provides science/environmental activities on a monthly basis (see https://www.evols.org/homeschool-fridays/). And we have a Community Program Series for families, which offers lectures, activities and field trips at least once a month (see https://www.evols.org/community-programs/). We don't currently offer formal education programs for students in grades 6-12, but we do have a volunteer program for High School students. |
| Kids for the Bay | KIDS for the Bay offers many programs: Watershed Action Program, Storm Drain Rangers, Watershed Rangers Program, Classroom Workshops, Schoolwide Programs, Field Trips and Blue Watershed Classrooms. |
| California Coastal Commission | Schoolyard Cleanup / Neighborhood Cleanups / Coastal Cleanup Day California King Tides Project Environmental Justice Resources for Educators Climate Video Challenge Coastal Art & Poetry Contest Kids Ocean Day |
| Solano Resource Conservation | Suisun Marsh Program, Watershed Explorers Program, School water education program, Biomonitoring Program, Benicia Water Program, Rio Vista Estuarine Research Program |
| Cordell Bank National Marine Sanctuary | virtual classroom visits, teacher trainings via webinar and Ocean Exploration Research, ONMS webinar series |
| Richardson Bay Audubon Center and Wildlife Sanctuary | Audubon Youth Leaders, Community Conservation Fellowship, habitat restoration opportunities (youth and adults) |
| The Marine Mammal Center | The Marine Mammal Center has a host of different programs, including middle-school teacher professional development programs in California (Ocean Ambassadors) and Hawaii (Na Kokua O Ke Kai). For high school students, we have programs aimed at conservation and environmental science through a service learning program called Youth Crew, an online/in-person monthly offering called Stewardship Saturday. For middle-school students, we offer an online program called Ocean Conservation Leaders as well which runs for 12 weeks and builds environmental science and conservation skills/knowledge.  For public programs, we offer a range range of tours and programs for youth and general public including Marine Science Sunday, Marine Mammal Mondays, onsite guided tours and online learning resources. |
| Don Edwards National Wildlife Refuge | Currently we only have on-line resources available, the Salt Marshes of San Francisco and San Pablo Bays Distance Learning Unit. We also did a Virtual Summer Camp that reached a wider audience. |

|  |  |
| --- | --- |
| **Responding Organization** | **Q.10 What new program offerings do you hope to develop in coming years? How soon will you offer these programs?** |
| Save the Bay | Learning module for K-5. Within the next three years. |
| Gulf of the Farallones National Marine Sanctuary | 1) Possible expansion of virtual marine science programming out-of-state to partner with other national marine sanctuaries across the country and highlight the diverse resources all across the United States. Unsure how soon that will be offered.  2) An effort to highlight more BIPOC scientists and careers in ocean science from underserved/underrepresented communities through a video series. Unsure how soon that will be offered. |
| Petaluma Wetlands Alliance | none, just getting back to our school program in person will be great |
| The Watershed Project | 9-12 grade program called "Climate Change and Community Resilience: Green Infrastructure Practicum" (a high school program that is an alternative to the ocean acidification program we offer. Additionally, a 6-8th grade program called "Our Ecosystem, Our Community: From Me to the Sea" which focuses on marine debris. Both of these we plan to offer in the 2021-2022 school year. We will also adapt our high school program slightly to focus on rain gardens for a SFPUC/SFUSD partnership program. |
| East Bay Regional Parks/Big Break Visitors Center | We have just restructured all of our K-5 programs to be NGGS-aligned and offer both virtual and in-person formats |
| Environmental Volunteers | We are continuing to seek for/develop new programs for our Homeschool program and our community-based programs that incorporate local resources (parks, etc.) and connecting families with nature through outdoor experiences. We are also continuing to update our K-5 school-based curriculum to better align w/NGSS. |
| Kids for the Bay | We only have plans to expand our current programs, especially the Watershed Rangers Program and Blue Watershed Classrooms. |
| California Coastal Commission | no specific new programs are planned at this time |
| Solano Resource Conservation | We just piloted a teacher training called Solano Water Institute with 30 teachers during the summer. It was very well received and nearly everyone that registered fulfilled the course. |
| Cordell Bank National Marine Sanctuary | more virtual professional development course offered that have interactive elements to them, 1-2 years out |
| Richardson Bay Audubon Center and Wildlife Sanctuary | We're kicking off year one of our fellowship program, which is grant funded. I hope to be able to build this into the budget and offer it every year. We're also looking to expand our teen programming and partner with local organizations, such as Marin 9 to 25. |
| The Marine Mammal Center | We hope to continue expanding our middle school professional development opportunities. |
| Don Edwards National Wildlife Refuge | More Hybrid and Self-guided activities to be developed as soon as we can! |

|  |  |
| --- | --- |
| **Responding Organization** | **Q.11 What challenges have you encountered in offering estuary and environmental science education programs in this new virtual world?** |
| Save the Bay | Engaging students virtually. Connection issues in the field. |
| Gulf of the Farallones National Marine Sanctuary | Biggest challenge is not being able to give participants an opportunity to be in the field by virtue of being virtual. We do our best to bring the experience of the ocean to their home through virtual experiences. Another challenge has been learning how to make the virtual classes interactive and engaging by having multiple presenters and opportunities for participation through questions, polls, and at home activity kits which we mail to students. Later into the year, this became more evident with Zoom and in general at-home fatigue and the lower demand for virtual programming as things started to open up this summer. Lastly, there were general technological challenges in the new virtual world that we were able to troubleshoot with experience. |
| Petaluma Wetlands Alliance | We taught 700+ 3rd graders each year with their chaperones and teachers before COVID. Not one teacher asked for us to develop online experience. |
| The Watershed Project | Student engagement, tracking outdoor engagement, classroom management, labs, students' ability to pick up physical materials from school for activities. |
| East Bay Regional Parks/Big Break Visitors Center | Hands-on activities |
| Environmental Volunteers | Virtual doesn't even come close to having the same impact as live/in-person/hands on - attention spans are shorter, internet connectivity is inconsistent between schools and individuals, and overall technology is not equitably available to all communities. It's also much harder to have a live/interactive experience within in the actual outdoor setting, and live-stream is more effective than pre-recorded for engaging students and families. While useful for foundational knowledge, seeing something on the screen just doesn't make the same impact as being in a location and seeing/smelling/touching nature directly. |
| Kids for the Bay | It has been most challenging to get students outside, as some have not been allowed to walk out their front door in recent years and we have not been able to guide field trips. Also, supply access for simple experiments can be challenging. |
| California Coastal Commission | Some opportunities have been lower barriers to attendance of online events versus in person. Challenges include greater need for self-initiative to participate, rather than joining with a group. Zoom burnout is on the rise. |
| Solano Resource Conservation | Virtual programs are second best. However, teachers still have interest. Teaching virtually makes it easy for teachers to cancel at the last minute. It can be challenging to gauge how much students are really learning from online platforms. Although, the virtual programs are quite incredible and allow us to see how students are interacting with programs (peardeck). |
| Cordell Bank National Marine Sanctuary | teachers are stressed out and are dealing with changing conditions that is very detrimental to being ready to absorb new information |
| Richardson Bay Audubon Center and Wildlife Sanctuary | People have Zoom fatigue! Also, as we navigate the Delta variant, folx are nervous about doing any type of programming in person. Environmental programs are so place-based, it's a hard experience to replicate online. It takes a special type of person to convey that type of information in a compelling way. |
| The Marine Mammal Center | There is certainly a digital divide, as well as engagement difficulties with some audiences with the virtual world. Being able to "level the playing field" by providing physical materials to participants that can have a hands-on experience in addition to the virtual learning has been helpful. |
| Don Edwards National Wildlife Refuge | Technology can be very challenging and unreliable for both the presenters and the receivers.  Access to technology can be an obstacle for some learners. |

|  |  |
| --- | --- |
| **Responding Organization** | **Q.12 What programs do you anticipate resurrecting for 2021-2022 when school resumes in-person? Will any of these programs drastically change from pre-pandemic, and if so, how?** |
| Save the Bay | In-person field trips. The biggest change is we won't have as many students over all, and we will have smaller groups per trip. |
| Gulf of the Farallones National Marine Sanctuary | We hope to resurrect all our K-12 programs eventually when school resumes in-person (in particular the Visitor Center field trips, in-person Fisherman in the Classroom, LiMPETS field monitoring, Oceans After School, and camps). We are still assessing what our staff and workplace is comfortable with along with what the schools, teachers, and students we serve want and need. We do not anticipate starting to do these program immediately at the start of the new school year, but rather continue some level of virtual programming in the fall, possibly doing a hybrid of virtual and in-person for some of our multi-session programs, and then transition to full time in-person based on local conditions. That may not happen until the new year. For programs that go back in-person, we anticipate changes to our lessons to be in line with health guidelines (maintaining social distancing, masks etc). We do not think there will be drastic changes, especially for programs that take place outside where students can be in the field and interact with the habitat individually, but some programs that require close proximity and interaction/ sharing will need to be rethought and adjusted. |
| Petaluma Wetlands Alliance | 3rd grade program - classroom visit of 3 hrs. + local field trip 3 hrs. will change very little except docents, being 65+ yrs old will probably wear masks for personal safety. Some docents may decline to continue. |
| East Bay Regional Parks/Big Break Visitors Center | Pandemic gave us the opportunity to restructure our programs |
| Environmental Volunteers | We are planning on bringing back all of our in-person programs, but will be adapting our classroom programs to use less shared materials; this causes great concern from an environmental perspective if this means more waste. We also have no idea what field trips will look like - we usually have 2 classes/bus participate, but if students are required to be more spaced out, that means fewer students per field trip, and more of an environmental impact through additional vehicles on the road; transportation budgets and accessible vehicles have also been gutted. We are designing more "walkable" field trips to account for some of these changes - to still get students outside in nature, but not always requiring a bus to transport them to farther away locations. Advantages are that we can teach nature anywhere, but major disadvantage is that we won't be introducing students to some of the amazing, but slightly hidden gems, of the open space areas available in the Bay Area. |
| Kids for the Bay | Field trips and all of our in-person programs at schools will hopefully resume this year. We have edited our curriculum to emphasize more time outside, and we will incorporate more digital teaching aids. |
| California Coastal Commission | We are still wait and see for much. For Kids Ocean Day, we are fortunate to be able to budget for a potentially much higher bus budget, which may be necessary if field trips are allowed requiring less dense bus travel. |
| Solano Resource Conservation | We plan to continue the virtual teaching at this time. |
| Cordell Bank National Marine Sanctuary | virtual classroom visits was a thing before the pandemic and will continue, we hope to return to some field education programs too. Haven't gotten that far ahead yet in planning as its an evolving situation |
| Richardson Bay Audubon Center and Wildlife Sanctuary | We are hoping to increase the size of our outdoor stewardship events as well as offer intimate, new opportunities at our site such as book clubs, poetry readings, and open mics, all geared toward the environment and science. |
| The Marine Mammal Center | We hope to continue resuming on-site school tours and visitor programming to the hospital, as well as educator visits and in-person gatherings for our middle school teacher professional development offerings. |
| Don Edwards National Wildlife Refuge | This is the 50 Million dollar question! We will most likely change ALL of our program offerings in some manner. |

|  |  |
| --- | --- |
| **Responding Organization** | **Q.13 Any additional comments or insights that you would like to share?** |
| Gulf of the Farallones National Marine Sanctuary | Thank you for doing this valuable research which we hope will be shared widely and help inform how all of our organizations can best meet the needs of our teachers, students, and general public. |
| Petaluma Wetlands Alliance | We are spending effort to build up our web page information and also produced a 2nd edition to our Petaluma Wetlands Field Guide due to stay at home with COVID safety. |
| The Watershed Project | virtual pd opportunities have been for the most part really great, virtual teaching for the most part was very hard. |
| Environmental Volunteers | There's still a lot of uncertainty about what schools will allow for the new school year; we are trying to adapt and make our programs flexible enough to be able to adjust quickly, but there's a lot we just don't know yet. Field trips are the biggest question mark, and the biggest concern - whether kids will just entirely lose that experience. Focusing on homeschool families and after-school program opportunities will hopefully be one way we can counter that scenario |
| Kids for the Bay | No, other than I, Laurel, will end this position in a few weeks, so Mandi Billinge will be your best contact. |
| California Coastal Commission | I'm afraid I don't feel able to anticipate what's to come with any high level of confidence. |
| Cordell Bank National Marine Sanctuary | Teachers love to get to know places outdoors, teachers have shared with me that they don't necessarily have the highest knowledge of local ecosystems and processes and are very enthused about getting to know places better and learning about the NGSS standards and content in that context. time will tell how this will evolve. |
| Richardson Bay Audubon Center and Wildlife Sanctuary | Great survey! Thanks for helping me think through some of these things. I look forward to see the results. |
| The Marine Mammal Center | You can see more of The Marine Mammal Center's programming at www.MarineMammalCenter.org/education |
| Don Edwards National Wildlife Refuge | Thanks for sending this. It helped me think through many aspects of our programming and what it will look like in the future. Good luck in your quest. |

**Survey Questions**

1.) We will ask about programs you currently offer teachers and students in K12, as well as the public (adults). We are particularly interested in programs that focus on estuaries and watersheds. Please list up to 10 programs with which you are currently involved in the spaces below.

2.) Please tell us about the areas you serve. Which county or counties do you primarily serve? Are there additional areas that your current programs reach, including virtually?

|  |  |
| --- | --- |
| [Check Box] | County |
|  | Alameda |
|  | Contra Costa |
|  | Marin |
|  | Napa |
|  | San Fransisco |
|  | San Mateo |
|  | Santa Clara |
|  | Solano |
|  | Sonoma |
|  | Other [open ended responses] |

3.) With the shift to NGSS and virtual learning over the past decade, demand and interest for program offerings has inevitably changed. Based on program demand over the last year, how do you anticipate demand will change over the next couple years? Programs offered for ...

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Anticipated Demand Change by Audience | Greatly Increased Demand | Slightly Increased Demand | No Change | Slightly Decreased Demand | Greatly Decreased Demand |
| Early elementary (K-2) students |  |  |  |  |  |
| Upper elementary (Gr 3-5) students |  |  |  |  |  |
| Middle school (Gr 6-8) students |  |  |  |  |  |
| High school students |  |  |  |  |  |
| Undergraduate college students |  |  |  |  |  |
| Elementary school teachers |  |  |  |  |  |
| Middle School teachers |  |  |  |  |  |
| High school teachers |  |  |  |  |  |
| Adult learners |  |  |  |  |  |

4.) With the shift to NGSS and virtual learning over the past decade, demand and interest for program offerings has inevitably changed. Based on program demand over the last year, how do you anticipate demand will change over the next couple years?

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Anticipated Demand Change by Type | Greatly Increased Demand | Slightly Increased Demand | No Change | Slightly Decreased Demand | Greatly Decreased Demand | Varies Too Much To Say |
| Virtual, live-stream classroom lessons |  |  |  |  |  |  |
| In-person field trips |  |  |  |  |  |  |
| Overnight Camps |  |  |  |  |  |  |
| Day Camps |  |  |  |  |  |  |
| Professional Development |  |  |  |  |  |  |
| Curricular materials and/or lesson plans aligned to NGSS |  |  |  |  |  |  |
| Virtual resources (activity sheets, videos) |  |  |  |  |  |  |
| Activities to be done with parents/outside of school hours |  |  |  |  |  |  |

5.) For programs directed towards elementary (K-5) students and schools, what helps a program appeal to teachers and schools?

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Elementary (K-5) Program Elements | Very Important | Somewhat Important | A Little Important | Not Important |
| Alignment to NGSS |  |  |  |  |
| Materials that can be used over again |  |  |  |  |
| Hands on activities |  |  |  |  |
| Problem or project-based activities |  |  |  |  |
| Inquiry based activities |  |  |  |  |
| Volunteer/service-learning activities |  |  |  |  |
| Geared towards underrepresented or underserved communities |  |  |  |  |
| Locally based programming |  |  |  |  |
| Customizable |  |  |  |  |
| Hybrid components |  |  |  |  |

6.) For programs directed towards middle and high school (grades 6-12) students and schools, what helps a program appeal to teachers and schools?

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Middle & High School (6-12) Program Elements | Very Important | Somewhat Important | A Little Important | Not Important |
| Alignment to NGSS |  |  |  |  |
| Materials that can be used over again |  |  |  |  |
| Hands on activities |  |  |  |  |
| Problem or project-based activities |  |  |  |  |
| Inquiry based activities |  |  |  |  |
| Volunteer/service-learning activities |  |  |  |  |
| Geared towards underrepresented or underserved communities |  |  |  |  |
| Locally based programming |  |  |  |  |
| Customizable |  |  |  |  |
| Hybrid components |  |  |  |  |
| Political/regulatory components |  |  |  |  |
| Leadership skill building component |  |  |  |  |
| College prep/mentorship |  |  |  |  |

7. For programs directed towards undergraduate college students and schools, what helps a program appeal to teachers and schools?

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Undergraduate College Program Elements | Very Important | Somewhat Important | A Little Important | Not Important |
| Materials that can be used over again |  |  |  |  |
| Hands on/lab activities |  |  |  |  |
| Problem or project-based activities |  |  |  |  |
| Inquiry based activities |  |  |  |  |
| Volunteer/service-learning activities |  |  |  |  |
| Geared towards underrepresented or underserved communities |  |  |  |  |
| Locally based programming |  |  |  |  |
| Customizable |  |  |  |  |
| Hybrid components |  |  |  |  |
| Political/regulatory components |  |  |  |  |
| Leadership skill building component |  |  |  |  |
| Internship/co-op/employment component |  |  |  |  |

8.) We also want to understand what teachers and informal educators look for in professional development courses. In your opinion, how important is each of the following?

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Educator Program Elements | Very Important | Somewhat Important | A Little Important | Not Important |
| CEUs offered |  |  |  |  |
| Virtual option |  |  |  |  |
| Stipend/funding |  |  |  |  |
| Aligned to NGSS |  |  |  |  |
| General interest in science |  |  |  |  |
| Interest to learn more science content |  |  |  |  |

9.) When thinking about programs geared towards the public (adults), what are the most important components that drive participation for your offerings?

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Public Program Elements | Very Important | Somewhat Important | A Little Important | Not Important |
| Interaction with scientists/research faculty |  |  |  |  |
| Events taking place over the weekend |  |  |  |  |
| Kid-friendly |  |  |  |  |
| Skill building (e.g. data analysis, species identification) |  |  |  |  |
| Spending time outdoors |  |  |  |  |

10.) What new program offerings do you hope to develop in coming years? How soon will you offer these programs?

11.) What challenges have you encountered in offering estuary or watershed education programs in this new virtual world?

12.) What programs do you anticipate resurrecting for 2021-2022 when school resumes in-person? Will any of these programs drastically change from pre-pandemic, and if so, how?

13.) Any additional comments or insights?

**Respondent Organizations to Survey**

* California Coastal Commission
* Cordell Bank National Marine Sanctuary
* Don Edwards National Wildlife Refuge
* East Bay Regional Parks/Big Break Visitors Center
* Environmental Volunteers
* Gulf of the Farallones National Marine Sanctuary
* Kids for the Bay
* Marine Mammal Center
* Petaluma Wetlands Alliance
* Richardson Bay Audubon Center and Wildlife Sanctuary
* Save the Bay
* Solano Resource Conservation
* The Watershed Project