



Kachemak Bay National Estuarine Research Reserve Education **Market Analysis Results June 2011**

Kachemak Bay National Estuarine Research Reserve (KBNERR), located in Homer, Alaska, is part of the National Estuarine Research Reserve (NERR) System, which is comprised of 28 coastal reserves in 22 states and Puerto Rico. The NERR system is managed by the National Oceanic and Atmospheric Administration (NOAA), National Ocean Service/Office of Coastal and Resource Management. Each reserve is made up of a partnership between NOAA and a state entity. In the case of KBNERR that state entity is the Alaska Department of Fish and Game, Sport Fish Division. KBNERR engages in coastal research and education within Kachemak Bay, the only fjord within the Reserve system.

KBNERR offers highly effective public and school-based marine science education using a unique Discovery Lab format. KBNERR educators utilize an on-site science lab and an adjacent coastal salt marsh to explore an array of resource and science-based topics.

During the spring of 2011 KBNERR education staff conducted a market analysis as part of a Reserve-wide effort by the NERR to identify gaps in coastal education. On a local level the market analysis will enable KBNERR and partnering coastal educators in the Homer area to identify current educational offerings and outreach efforts in the Homer area, and to plan collectively to fill informational gaps by creating new educational opportunities.

A complementary *Needs Assessment* conducted at the same time identifies the coastal education needs of teachers and students within the Kenai Peninsula Borough.

Survey Process:

KBNERR targeted coastal educators working within the greater Homer area. A total of 13 educators from State, Federal, and non-profit organizations were identified for the survey based on their experience and/or interest in coastal education. Emails went out to each of them on three separate occasions requesting their participation in the survey. Nine educators responded to the request to fill out the Market Analysis for a response rate of 69.2%. All educators are known to KBNERR staff, and most partner with KBNERR on program delivery, outreach efforts, and annual program planning.

Question 1:

The respondents gave the following contact information for their organizations:

Sustainable Homer
PO Box 1801, Homer, AK 99603
Kyra@sustainablehomer.org
sustainablehomer.org

Center for Alaskan Coastal Studies
708 Smokey Bay Way, Homer, AK 99603
beth@akcoastalstudies.org
www.akcoastalstudies.org

HoWL Inc.
PO box 3514
homerwildernessleaders@gmail.com
www.howlalaska.org

UAA's Kachemak Bay Campus-Kenai Peninsula College
533 E. Pioneer Ave, Homer, AK 99603
incis@kpc.alaska.edu
homer.alaska.edu

Ground Truth Trekking
PO Box 164, Seldovia, AK
hig314@gmail.com
<http://www.groundtruthtrekking.org>

Alaska Maritime National Wildlife Refuge
95 Sterling Hwy, Suite 1, Homer, AK, 99603
lisa_matlock@fws.gov
<http://alaskamaritime.fws.gov/>

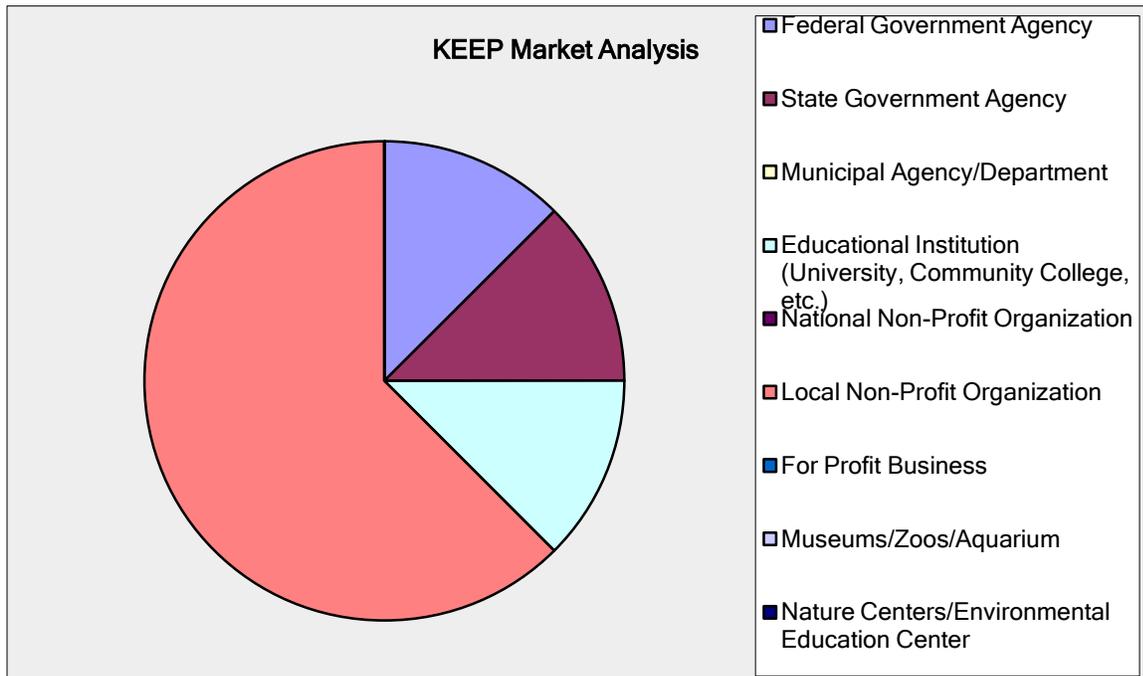
Alaska Department of Fish and Game
3298 Douglas place, Homer, AK 99603
235-1757
michael.booz@alaska.gov
<http://www.adfg.alaska.gov/index.cfm?adfg=home.main>

Pratt Museum
3779 Bartlett Street, Homer, AK 99603
907-435-3322
rchristianson@prattmuseum.org
www.prattmuseum.org

Kachemak Bay Conservation Society
3734 Ben Walters Lane
(907)299-8821
kbayconservation@gmail.com
kbayconservation.org

Question 2:

How would you classify your organization?		
Answer Options	Response Percent	Response Count
Federal Government Agency	12.5%	1
State Government Agency	12.5%	1
Municipal Agency/Department	0.0%	0
Educational Institution (University, Community College, etc.)	12.5%	1
National Non-Profit Organization	0.0%	0
Local Non-Profit Organization	62.5%	5
For Profit Business	0.0%	0
Museums/Zoos/Aquarium	0.0%	0
Nature Centers/Environmental Education Center	0.0%	0
Other (please specify)		1
<i>answered question</i>		8
<i>skipped question</i>		2



The majority of respondents work for local non-profit organizations with the exception of one individual who works for the federal government and one who works for the State of Alaska. One respondent checked “other” and indicated her organization as an “e-network”.

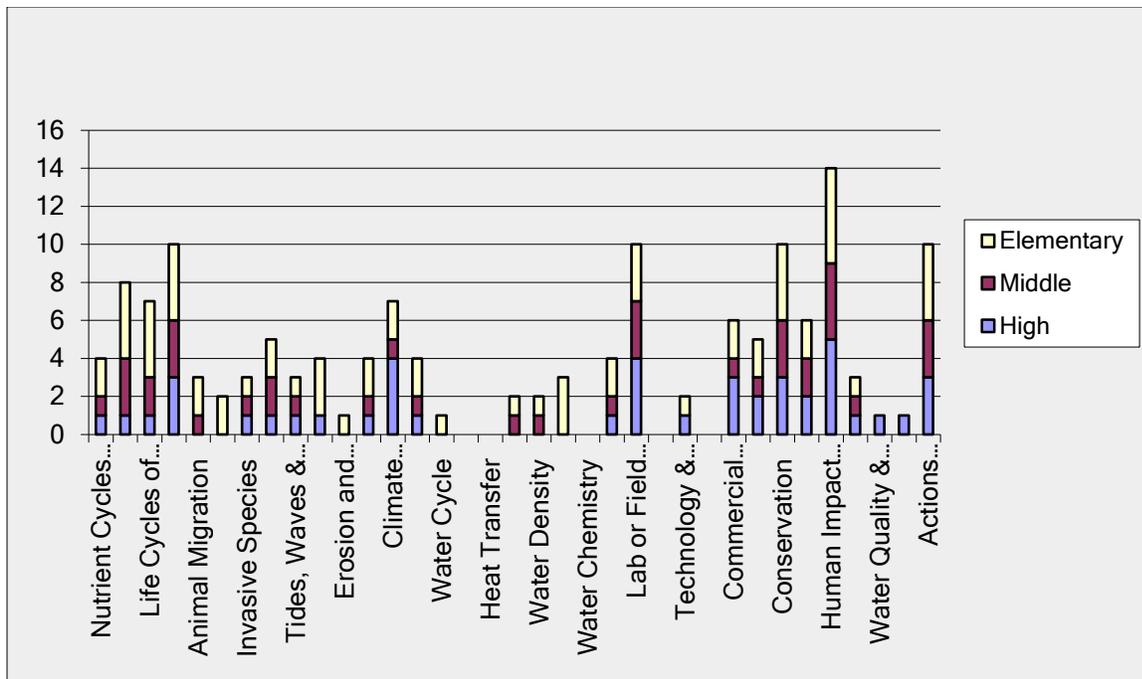
Question 3:

Are you NOAA or a NOAA partner?		
Answer Options	Response Percent	Response Count
No	100.0%	9
Yes, I work for Sea Grant	0.0%	0
Yes, I work for National Marine Sanctuaries	0.0%	0
Yes, I work for NOAA fisheries	0.0%	0
Yes, I work for:		1
<i>answered question</i>		9
<i>skipped question</i>		1

Only one respondent works for NOAA, and under “other” identified herself as an education staff person with KBNERR.

Question 4:

Which of the following topics are addressed by your educational programs and for what grade levels?				
Answer Options	Elementary	Middle	High	Response Count
Nutrient Cycles and Food Webs	2	1	1	2
Biodiversity and Adaptations	4	3	1	4
Life Cycles of Marine/Aquatic Organisms	4	2	1	4
Marine/Aquatic Habitats	4	3	3	4
Animal Migration	2	1	0	2
Estuaries as Nurseries for Marine Life	2	0	0	2
Invasive Species	1	1	1	1
Geologic Change	2	2	1	2
Tides, Waves & Currents	1	1	1	1
Rivers and Watersheds	3	0	1	4
Erosion and Sedimentation	1	0	0	1
Weather	2	1	1	2
Climate Change/Sea Level Rise / Ocean Acidification	2	1	4	5
Earth Systems	2	1	1	2
Water Cycle	1	0	0	1
Physical Properties of Water	0	0	0	0
Heat Transfer	0	0	0	0
Salinity	1	1	0	1
Water Density	1	1	0	1
Wetlands/Marshes	3	0	0	3
Water Chemistry	0	0	0	0
Experimentation & the Scientific Method	2	1	1	2
Lab or Field Work Techniques	3	3	4	4
Real estuary measurements and data (temperature, dissolved oxygen, salinity, etc)	0	0	0	0
Technology & Instrumentation	1	0	1	1
Interdisciplinary Research	0	0	0	0
Commercial Fishing & Fisheries	2	1	3	3
Water Pollution	2	1	2	3
Conservation	4	3	3	4
Recreation (Fishing, Birding, Boating, etc.)	2	2	2	2
Human Impact on the Environment	5	4	5	6
Coastal Hazards	1	1	1	1
Water Quality & Health	0	0	1	1
Marine Related Careers	0	0	1	1
Actions citizens/students can take	4	3	3	4
<i>answered question</i>				8
<i>skipped question</i>				2



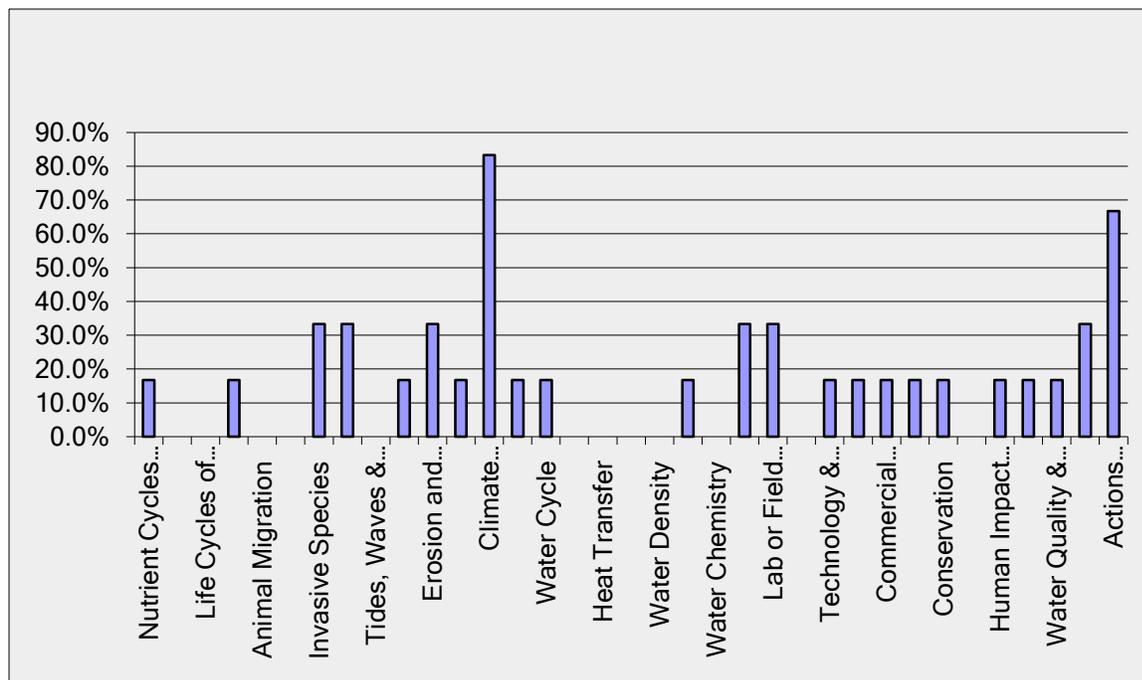
To the question of topics addressed six of eight respondents (75%) indicated that they address human impacts to the environment, while five of eight responded that they address climate change, sea level rise and/or ocean acidification. Half of the respondents indicated that they address biodiversity and adaptations; life cycles of marine and/or aquatic organisms; marine and/or aquatic habitats; rivers and watersheds; lab or field work techniques; conservation; and actions that citizens and students can take. Conversely, no one surveyed indicated that they teach real estuary measurements and data; water chemistry; heat transfer; physical properties of water, or interdisciplinary research. This indicates a clear gap in physical oceanography topics addressed by Homer coastal educators.

The results also indicate that more of the topics listed are being targeted toward elementary students. Middle school and high school students are receiving instruction on fewer of the topics listed, and by fewer instructors.

This indicates that either middle and high school students are receiving instruction outside of those topics listed in the survey question, or elementary students participate in the bulk of coastal education programs conducted by the organizations participating in the survey.

Question 5:

Reviewing the same list - which topics do you think need more attention?		
Answer Options	Response Percent	Response Count
Nutrient Cycles and Food Webs	16.7%	1
Biodiversity and Adaptation	0.0%	0
Life Cycles of Marine/Aquatic Organisms	0.0%	0
Marine/Aquatic Habitats	16.7%	1
Animal Migration	0.0%	0
Estuaries as Nurseries for Marine Life	0.0%	0
Invasive Species	33.3%	2
Geologic Change	33.3%	2
Tides, Waves & Currents	0.0%	0
Rivers and Watersheds	16.7%	1
Erosion and Sedimentation	33.3%	2
Weather	16.7%	1
Climate Change/Sea Level Rise / Ocean Acidification	83.3%	5
Earth Systems	16.7%	1
Water Cycle	16.7%	1
Physical Properties of Water	0.0%	0
Heat Transfer	0.0%	0
Salinity	0.0%	0
Water Density	0.0%	0
Wetlands/Marshes	16.7%	1
Water Chemistry	0.0%	0
Experimentation & the Scientific Method	33.3%	2
Lab or Field Work Techniques	33.3%	2
Real estuary measurements and data (temperature, dissolved oxygen, salinity, etc)	0.0%	0
Technology & Instrumentation	16.7%	1
Interdisciplinary Research	16.7%	1
Commercial Fishing & Fisheries	16.7%	1
Water Pollution	16.7%	1
Conservation	16.7%	1
Recreation (Fishing, Birding, Boating, etc.)	0.0%	0
Human Impact on the Environment	16.7%	1
Coastal Hazards	16.7%	1
Water Quality & Health	16.7%	1
Marine Related Careers	33.3%	2
Actions citizens/students can take	66.7%	4
Other (please specify)		1
	<i>answered question</i>	6
	<i>skipped question</i>	4



Question 5 reveals the level of importance coastal educators place on the listed topics relative to the degree to which it is being taught.

Of particular interest are those topics that respondents indicate they were not teaching at all, yet did not indicate as needing more attention. These topics include: physical properties of water; heat transfer; water chemistry; and real estuary measurements and data.

Additionally, topics that only garnered one response under topics addressed, but had a response of zero under topics that need more attention (or the reverse - with a response of zero under topics addressed and only one response under topics that need more attention) also indicate a gap that educators are failing to recognize. These are: salinity; water density; and interdisciplinary research.

All of these topics fall under the discipline of physical oceanography. Again the survey results indicate a gap in the education offered by KBNERR and other local coastal educators.

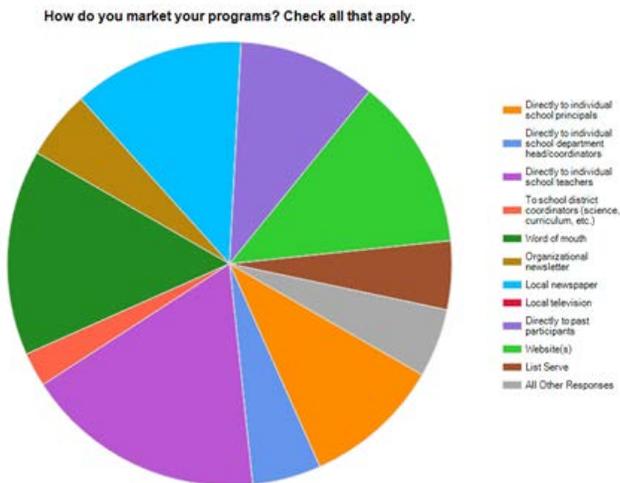
Conversely, two topics that are being offered by multiple educators at multiple grade levels were identified as needing more attention. These include climate change/sea level rise/ocean acidification; and lab or field work techniques.

One individual marked “other” and included the following comment:

“Human impacts on natural resources (long-term perspectives are particularly lacking)”

Question 6:

How do you market your programs? Check all that apply.		
Answer Options	Response Percent	Response Count
Directly to individual school principals	57.1%	4
Directly to individual school department head/coordinators	28.6%	2
Directly to individual school teachers	100.0%	7
To school district coordinators (science, curriculum, etc.)	14.3%	1
Word of mouth	85.7%	6
Organizational newsletter	28.6%	2
Local newspaper	71.4%	5
Local television	0.0%	0
Directly to past participants	57.1%	4
Website(s)	71.4%	5
List Serve	28.6%	2
Other (please specify)	28.6%	2
<i>answered question</i>		7
<i>skipped question</i>		3



Survey participants use a variety of methods to market their programs, with the most common methods being: directly to individual school teachers (100%); word of mouth (85.7%); local newspapers, and to websites (71.4% each); and directly to individual school principals, and to past participants (57.1%). Because Homer is a small community and the next town of any size is 90 miles by road to the north, most people within the educational community know one another, and direct communication is both effective and expected. KBNERR has had good success with school district coordinators and list serves as well. Homer does not have a local television station, so this option did not garner any results.

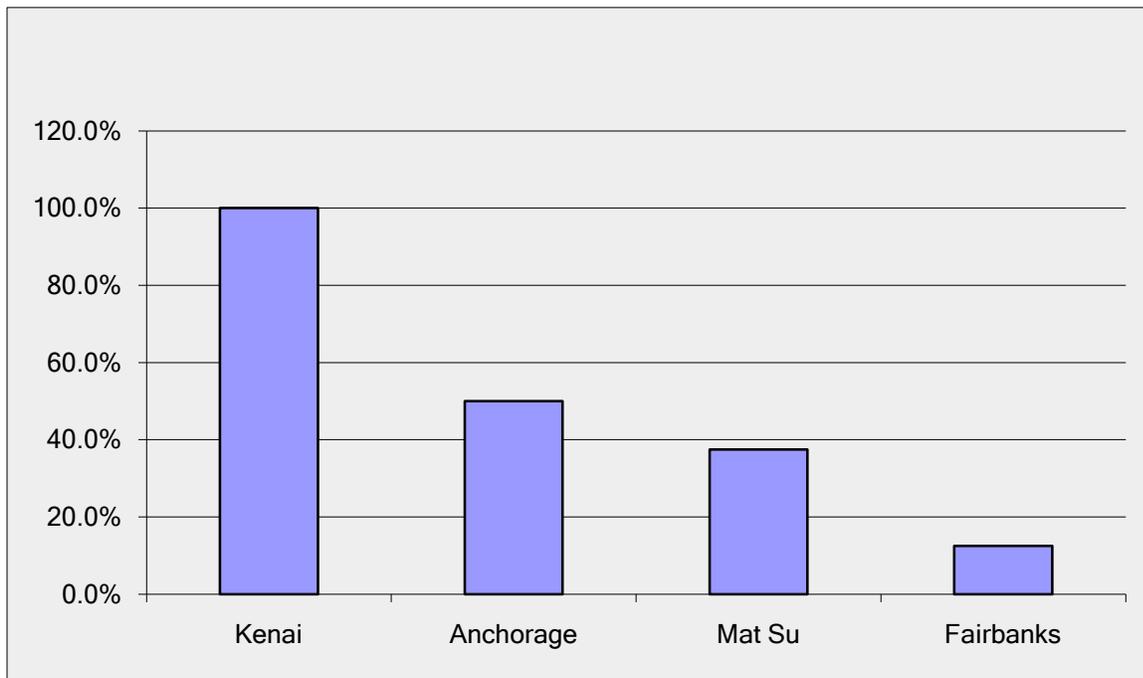
Question 7:

Which Alaskan boroughs do you serve?		
Answer Options	Response Percent	Response Count
Kenai	100.0%	8
Anchorage	50.0%	4
Mat Su	37.5%	3
Fairbanks	12.5%	1
Other (please specify)		1
<i>answered question</i>		8
<i>skipped question</i>		2

Survey responders provide the majority of their coastal education to students from the Kenai Peninsula (100%), the Anchorage Borough (50%), and the Matanuska Susitna Borough (37.5%). With the exception of one responder who travels to remote villages (see below) all coastal educators work locally either on site or in area schools.

One respondent selected “other” and provided the following information:

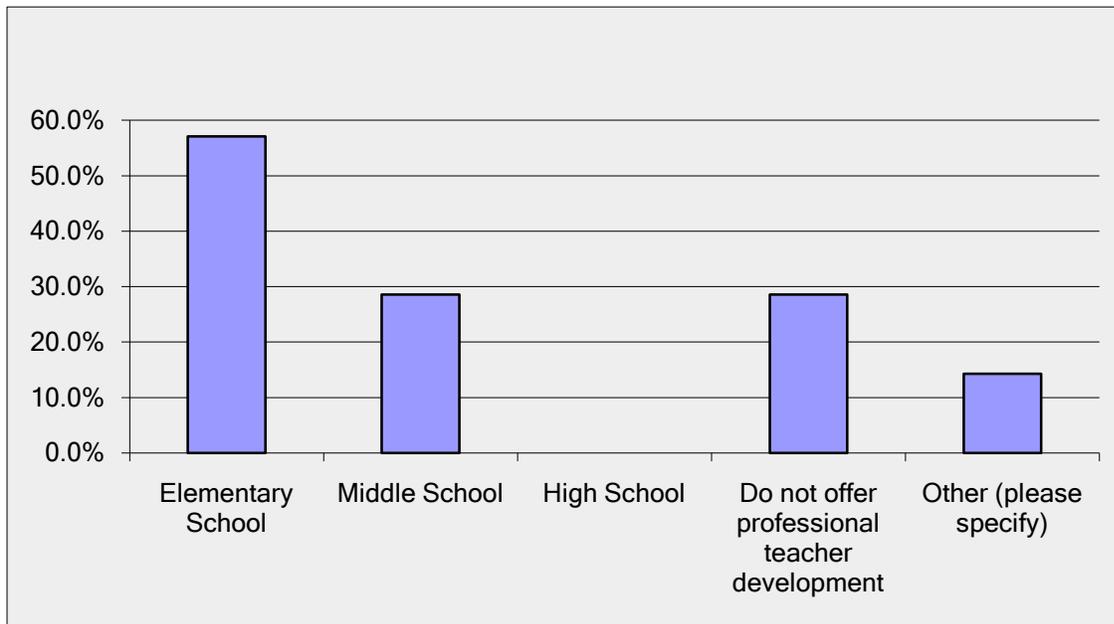
Aleutian Region, Aleutians East, Pribilof Islands, North Slope, Kodiak, Sitka, Nome



Question 8:

If your organization provides teacher professional development, at what grade level educator are your programs targeted? Check all that apply.

Answer Options	Response Percent	Response Count
Elementary School	57.1%	4
Middle School	28.6%	2
High School	0.0%	0
Do not offer professional teacher development	28.6%	2
Other (please specify)	14.3%	1
answered question		7
skipped question		3



Six survey responders (out of nine) indicated that they offer professional teacher development. Most of the programs target elementary school educators (four of six), while the balance target middle school educators (two of six). Based on the KBNERR *Needs Assessment* conducted concurrently with this market analysis, area high school teachers are in need of coastal teacher professional development opportunities. This lack of emphasis on high school- level professional teacher development is a gap that Homer coastal education organizations should look to fill.

Under “other” one individual stated:

“Occasional teacher development, different grade levels”

Question 9:

If you offer teacher professional development, do you work with the Kenai Community College or other university to offer college credit?		
Answer Options	Response Percent	Response Count
Do not offer teacher professional development	57.1%	4
Yes, we work with Kenai Peninsula College	42.9%	3
Yes we work with another university or college	14.3%	1
Please specify what university or college		1
<i>answered question</i>		7
<i>skipped question</i>		3

Those responders who offer teacher professional development do so through the Kenai Peninsula College. This college is part of the University of Alaska, Anchorage system, and has branches in several communities on the Kenai Peninsula, including the Kachemak Bay Campus in Homer (see “other” below).

Other:

Kachemak Bay Campus of Kenai Peninsula College-UAA

Question 10:

How many paid staff members does your education department have?		
Answer Options	Response Percent	Response Count
0	14.3%	1
1-2	57.1%	4
3-4	14.3%	1
5-9	14.3%	1
10 or more	0.0%	0
<i>answered question</i>		7
<i>skipped question</i>		3

Of the seven respondents that replied to this question, the majority (four) have 1 – 2 staff members in their organization’s education department. One respondent has none; one has three to four educators (KBNERR); and one has five to nine.

Question 11:

What kinds of educational programs does your organization provide? Please check all that apply.		
Answer Options	Response Percent	Response Count
Preschool programs	25.0%	2
K - 12 in school programs	75.0%	6
Programs for K - 12 schools visiting your facilities	37.5%	3
Programs for K - 12 home school students	37.5%	3
Field trips for K-12 students	75.0%	6
After school programs	25.0%	2
School break programs (other than summer)	25.0%	2
In-service teacher trainings	37.5%	3
Informal educator training	25.0%	2
Lectures	50.0%	4
summer camps	50.0%	4
Guided hikes	50.0%	4
Citizen science programs	25.0%	2
Kayaking programs	0.0%	0
Web-based programs	12.5%	1
Distance learning (virtual classroom) programs	12.5%	1
Radio programs	12.5%	1
Film series	12.5%	1
Other (please specify)		1
	<i>answered question</i>	8
	<i>skipped question</i>	2

The educational programs offered by Homer coastal educators are quiet varied. 75% of responders offer K-12 programs and field trips for K-12, 50% offer lectures, summer camps, and guided hikes. None of the responders works for an organization that offers kayaking programs (although these programs are available in the Homer area), and web-based programs, distance learning programs, radio programs, and film series are offered by only one responder each.

Under “other” one responder (from KBNERR) replied:

“Kid's fishing days”

Question 12:

Do you offer professional development credits for teacher trainings?		
Answer Options	Response Percent	Response Count
Yes	42.9%	3
No	57.1%	4
Don't know	0.0%	0
Other (please specify)		1
<i>answered question</i>		7
<i>skipped question</i>		3

This information was largely covered in Question 8. Three of seven responders indicate that their organization offers profession development credits for teacher trainings.

Under “other” one respondent replied:

“Hopefully in the future”

Question 13:

Do your environmental programs directly involve outdoor activities with your students?		
Answer Options	Response Percent	Response Count
Yes, nearly always	42.9%	3
Sometimes, if time and weather allow	28.6%	2
It depends on the program	28.6%	2
Seldom	14.3%	1
No, we do all of our programs in an indoor setting	0.0%	0
Other (please specify)		0
<i>answered question</i>		7
<i>skipped question</i>		3

All responders include outdoor activities at least part of the time. 42.9% do so nearly always, while only 14.3% seldom do. Homer has a moderate maritime climate which is more conducive to year-round outdoor activities than many parts of the state, however snow storms and high winds can hinder plans for outdoor activities and educators generally have a backup plan in place for such events.

Question 14:

Do you include information about climate change in your programs?		
Answer Options	Response Percent	Response Count
Yes, almost always	42.9%	3
Yes, if it relates to the program we're offering	28.6%	2
Not usually	28.6%	2
Not at all	0.0%	0
If not, why not (please specify)		0
<i>answered question</i>		7
<i>skipped question</i>		3

All responders include information about climate change, however 42.9% almost always do, while 28.6% usually do not. Given the strongly positive answer to Question 5 about the need to offer more education on the topic of climate change, it is probable that this topic will be included more often and over a broader grade range in the future as coastal educators gain more knowledge on the subject (see Question 16).

Question 15:

What climate change concepts do you include in your programs?		
Answer Options	Response Percent	Response Count
I don't include climate change concepts in my programs.	0.0%	0
Weather and climate	42.9%	3
greenhouse effect	14.3%	1
climate change impacts in Alaska	85.7%	6
Climate change impacts beyond Alaska	28.6%	2
Adaptations to climate change	57.1%	4
Other (please specify)		0
<i>answered question</i>		7
<i>skipped question</i>		3

All responders include climate change concepts in their programs, with most (85.7%) addressing climate change impacts in Alaska, followed by weather and climate (42.9%). Only one responder indicated that they include information about the greenhouse effect.

Question 16:

Would you be interested in local environmental education training specific to climate change issues?		
Answer Options	Response Percent	Response Count
Yes	83.3%	5
No	16.7%	1
Other (please specify)		1
<i>answered question</i>		6
<i>skipped question</i>		4

All responders with the exception of one would like to receive local environmental education training specific to climate change issues. Given the collaboration between coastal educators in the Homer area this can be fodder for future discussion and planning.

One responder selected “other” with the comment:

“Maybe - I've already done a lot”

Question 17:

What other trainings would you like to see made available to environmental educators in the Homer area?	
Answer Options	Response Count
	1
<i>answered question</i>	1
<i>skipped question</i>	9

Other trainings that were of interest to responders were:

“technology for educational use - including video conferencing, GPS-GIS for education, web-based delivery, video and audio production and editing for the web, uses of social media, etc.”

Summary:

KBNERR provides coastal education for adults and school groups through public and pre-K-16 Discovery Lab programs, Estuary Walks, and other family-oriented events. The information gathered in this survey best pertains to K - 12 program delivery, as most of the questions relate to K-12 programs or K-12 professional teacher development trainings. As such, the findings help define the strengths of and gaps in coastal education for K-12 students and their teachers in the Homer area.

Organizations that offer coastal education in the Homer area typically have only one or two staff dedicated to education. KBNERR has three full time staff and two summer interns, while one other organization has five to nine staff. Despite these small numbers, a broad range of coastal education takes place in Homer.

Fieldtrips and Outdoor Education:

All responders include outdoor activities at least part of the time, with 42.9% nearly always offering an outdoor component to their programs, and only 14.3% stating that they seldom do. Undoubtedly the recent “no child left inside” grassroots movement has raised awareness of the benefits associated with outdoor experiential play and learning.

Survey participants use a variety of methods to market their programs. Homer, being a small community, utilizes a personal approach, with all responders (100%) using direct communication to individual school teachers; followed closely by word of mouth (85.7%); local newspapers, and websites (71.4% each); and directly to individual school principals, and to past participants (57.1%).

Most coastal education program participants come from the surrounding Kenai Peninsula , and the Anchorage and Matanuska Susitna boroughs. Schools from Anchorage (220 miles north of Homer), and the Matanuska Susitna Valley (260 miles north of Homer) bus students down to Homer for multi-day fieldtrips. These trips typically include visits to two or more coastal education organizations. There is excellent cooperation between coastal educators who coordinate these trips with the participating teachers.

Teaching about Estuaries, Watersheds and the Ocean:

Most respondents (75%) indicated that they address human impacts to the environment, while five of eight responded that they address climate change, sea level rise and/or ocean acidification. Half of the respondents indicated that they address: biodiversity and adaptations; life cycles of marine and/or aquatic organisms; marine and/or aquatic habitats; rivers and watersheds; lab or field work techniques; conservation; and actions that citizens and students can take.

Conversely topics such as water chemistry; heat transfer; and physical properties of water are not being taught. This indicates a clear gap in Homer's coastal environmental education.

The results also suggests that more coastal educators are teaching these topics at the elementary school level, with a drop in both numbers of environmental educators teaching and subjects taught at the middle and high school level. Two possible conclusions can be drawn from this information – either middle and high school students are receiving instruction on subjects that were not listed in the survey question, or elementary students participate in more coastal education.

The results from Question 5, in which respondents rated topics that they felt needed more attention, were revealing. There were several topics respondents were not teaching at all, yet no one indicated a need for more attention. These topics include: physical properties of water; heat transfer; water chemistry; and real estuary measurements and data. Additionally, some topics garnered one response under topics addressed, but had a response of zero under topics that need more attention. These are: salinity; water density; interdisciplinary research. This reveals a gap in the discipline of physical oceanography that educators are failing to recognize.

Conversely, multiple educators at multiple grade levels identified climate change/sea level rise/ocean acidification; and lab or field work techniques as needing more attention, yet these subjects rated among the highest for programs offered across all grade levels by multiple responders.

The Science of Climate Change:

All responders include information about climate change in their programming, with 42.9% stating that they almost always do, and just 28.6% stating that they usually do not. As indicated above, responders identified a strong need to offer more education on the topic of climate change. Teachers responding to the *Needs Assessment* also indicated a need for more climate change education, and this may shape a future focus for many coastal educators.

Respondents expressed an interest in receiving local environmental education training specific to climate change issues. This may be an opportunity for KBNERR to bring a trainer in through our Coastal Training Program for a one-to-three day training for environmental educators on the impacts of climate change as it pertains to Alaska.

Professional Teacher Development:

Professional teacher development is offered by 66.6% of survey responders (six out of nine). Because most of the programs target elementary school educators (four of six), there is a clear gap in professional teacher development opportunities for middle and high school teachers. This is reinforced by the KBNERR *Needs Assessment* conducted concurrently with this market analysis in which Homer area teachers identified a need for coastal teacher professional development.

Conclusion:

The market analysis results were very illuminating, and should help KBNERR and other Homer-based coastal educators to shape their programs in the future. There were clear gaps in physical oceanography topics taught such as: physical properties of water; water chemistry; water density; salinity; heat transfer; real estuary measurements and data; and interdisciplinary research. Moreover, coastal educators did not recognize these topics as needing more attention.

By developing more programs on these topics with an eye towards delivery at the middle and high school level, the need for more programming for grades 7 – 12 can also be addressed. This focus can extend to grades 7 – 12 teachers as well, meeting the identified need for more professional teacher development at the middle and high school level.

Finally, coastal environmental educators are interested in an increased focus on climate change and lab or field work techniques, and expressed a desire for training on climate change issues. KBNERR could take the lead on finding the funding and expertise to offer environmental education to Homer's coastal educators on climate change and associated physical oceanography topics.