

Project #: 644

Title: Response and Intervention System for Climate Change Induced Paralytic Shellfish Poisoning in Aleut Communities

Principal Investigator(s) and Recipient Organization(s):

Victoria Gofman	Bruce Wright	Ray RaLonde
Aleut International Association	Aleutian Pribilof Islands Assoc.	Alaska Sea Grant
333 W. 4th Ave., Suite 301	201 E. 3rd Ave.	1007 W. 3rd Ave. 100
Anchorage, AK 99503	Anchorage, AK 99503	Anchorage, AK
victoriag@alaska.net	brucew@apiai.org	afrlr@uaa.alaska.edu
907-332-5388	907-222-4260	907-274-9697

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Lead Author of Report: Bruce Wright

Project Summary: This project will educate local residents about paralytic shellfish poisoning (PSP) and train them to use test kits to monitor for PSP toxin. The project activities will include workshops, development of a manual on how to set up a community-based surveillance system, and public outreach materials. The proposed communities extend the length of the Aleutian Islands where little baseline data is available on PSP toxin. Since 1973, over 150 outbreaks have been reported in Alaska, with three fatalities since 1994. In an effort to reduce the risk of PSP encounters, the Alaska Science and Technology Foundation funded research to develop a rapid test kit proposed by Jellett Biotech in Nova Scotia, Canada, which was developed in 1994 and, in 2004, was approved by Food and Drug Administration, Interstate Shellfish Sanitation Program for screening shellfish, opening opportunities for communities to use a reliable, inexpensive method. The project PIs will investigate the increased risk of PSP as a result of climate change and the reliability of traditional knowledge used when harvesting clams and mussels. Methods developed to monitor occurrence and distribution of PSP toxins in connection with climate change observations will increase communities' capacities in responding to the threat of poisoning while developing the process of interlinking modern technology and traditional knowledge.

Progress Summary: Village councils were contacted and four communities have been identified to participate in as primary study sites (Akutan, Sand Point and Unalaska in Alaska and Nikolsakoye, Bering Island, Russia) with plans for arranging for satellite communities (Atka, King Cove, Nelson Lagoon, Nikolski and St. George) to send samples to primary study sites or Anchorage for testing. Arrangements for steering committee meeting are being made and the meeting is scheduled for late July 2006 in Anchorage, AK.

Field supplies have been purchased including the HOBO temperature data loggers and Jellett PSP test kits. The field manual was written and presentation materials and PowerPoint presentation readied for taking to the field for training sessions.

The Sand Point village sampler (technician) was identified and the one year training and sample collection contract negotiated. Wright and RaLonde traveled to Sand Point on June 19-23, 2006 to coincide with the low tide series. Our primary outreach so far was the public meeting in Sand Point. During this field visit we presented a community public meeting to describe the project, educate people about PSP, the shellfish involved, the differences associated with PSP toxicity and the many species of shellfish, the species of shellfish in the local area, the toxins and their characteristics associated with PSP, the Jellett PSP test kits and introduced the local field technician and her duties during the next year. On the following days Wright and RaLonde provide extensive and detailed training to the field technician on shellfish anatomy, the protocol for shellfish identification and bivalve dissection and standard operation procedures (SOPs) for collection, sample preparation, testing using the Jellett test kit, storage and shipping (labels and record keeping). The technician was tested for proficiency in reading the Jellett test kits results on two subsequent days to insure accurate results.

A HOBO temperature data logger was calibrated and programmed to sample water temperatures every hour. The data logger was deployed from a floating dock at 4 meters and secured with 1/4 inch nylon line. The field technician will monitor the data logger. The Sand Point field technician contract parameters were identified and the contract is being finalized.

We tested eight shellfish samples in Sand Point. The Jellett test results were positive for PSP in blue mussels (*Mytilus trossolus*), Arctic surf clam (*Mactromeris polynyma*), Pacific razor clam (*Siliqua patula*), Pacific littleneck clam (*Protothaca staminea*), Nuttallii cockle (*Clinocardium nuttallii*), Alaska great tellin clam (*Tellina lutea*) and butter clam (*Saxidomus giganteus*) at 40 ug/100 gram (80 ug/100 gram limit is required by FDA). The samples were labeled, frozen and prepared for transport back to Anchorage. The test results were sent to Jellett Bioteck in Nova Scotia, Canada who immediately validated our results at 40 ug/100 gram and requested samples for testing individual toxins (21 toxins have been identified in PSP) and exact levels of each toxin (some of the 21 toxins are more toxic than others). These results will be reported when they become available. The draft monitoring plan for Sand Point is being finalized and a sampling and shipping information package for satellite communities is under development. We will be testing additional buffers supplied from the Jellett Lab. We will provide the Jellett Lab with samples and they will perform GCMS tests (free of charge) to validate our field results.

The standardized questionnaire survey of changes in and use of traditional knowledge as it relates to PSP is being developed. We will be training local PSP technicians to record assessment of harvest safety based on traditional knowledge of local users at the same locations and times as Jellett PSP testing for comparison.

We are currently in contact with other village councils to identify and contract additional local technicians. The visa for traveling to the Commander Islands, Russia has been received and we are completing plans for that trip. Most of the field supplies have been purchased; the remaining field supplies will be purchased during July-August.



Ray RaLonde presenting the PSP project at a Sand Point community meeting. Photo by Bruce Wright.



Bruce Wright holding a small butter clam secured from the primary clamming beach at Sand Point. Photo by Ray RaLonde.



Ray RaLonde is training the Sand Point technician and her assistant how to use the shellfish identification key. Photo by Bruce Wright.



Sand Point technician, Dana Osterback (left), and her assistant prepare a sample of butter clams to be tested for PSP. They had some interesting expressions during the dissection lessons. Photo by Bruce Wright.



Sand Point technician, Dana Osterback (left), and her assistant prepare a sample of mussels to be tested for PSP. About 40 medium mussels were needed for the test. Photo by Bruce Wright.



Ray RaLonde is watching the results on the SP test strip develop. Onlookers are interested in the project. Photo by Bruce Wright.



These developed Jellett PSP test strips are from the first shellfish samples ever tested for PSP in Sand Point, Alaska. Photo by Ray RaLonde.