

Introduction

In the summer of 2000, an exchange of letters between the Governor of Alaska and the Secretary of the Department of Energy (see Appendix 1.A1) generated CRESA's work on and assessment of possible contamination of the marine environment at Amchitka Island in the western Aleutians Islands. Amchitka had, beginning 35 years earlier, been the site of three underground nuclear tests, and concern about the effects of the tests had persisted. This report is the culmination of that effort by the Consortium for Risk Evaluation with Stakeholder Participation (CRESA), the institution cited in the Governor-Secretary exchange of letters as the research group selected to assure an independent evaluation of possible contamination at Amchitka and specifically to determine 1) whether marine biota consumed either as part of a subsistence diet or taken by commercial fishing is safe and 2) what organisms would be useful for long-term biomonitoring.

CRESA, a unique multi-university program involving leading research laboratories in diverse disciplines, is focused on evaluating risks and risk management issues at radioactive sites that are a legacy of DOE's nuclear weapons initiatives. Its work addressing similar problems in the DOE complex led to its selection by officials of both Alaska and the Department as being capable of providing competent and independent assessment. CRESA's initial scientific work regarding Amchitka in 2000 to 2001 was undertaken primarily by researchers at the University of Alaska at Fairbanks.

That work led in February 2002 to a CRESA/UAF sponsored scientific workshop that, in turn, was the catalyst for a singular Letter of Intent between DOE and the State of Alaska signed in the early summer of 2002. That letter (see Appendix 1.A3) called for a field-based assessment at Amchitka, but stipulated that there first be developed by CRESA an independent science assessment plan for that Amchitka work. The letter stipulated that that plan had to be approved by four parties: the State, DOE, the Aleutian Pribilof Island Association and the US Fish and Wildlife Service.

A major effort to define such a plan, developed iteratively in dialogue with the four entities and other stakeholders, resulted a year later, in June 2003, in a 166-page CRESA Amchitka Independent Assessment Plan (hereinafter, the *Science Plan*, see Appendix 1.C). The document was formally approved in the summer of 2003 by the four entities (see Appendix 1.B). The *Science Plan* called for an estimated expenditure of about \$11 million to be carried out over two summer seasons of field work at the Island and extensive post-field work data evaluation. The DOE provided funding of \$3.1 million and the four LOI-designated entities and CRESA agreed to prioritize tasks from the full plan to expend those funds and to incorporate those choices in the *Science Plan* itself. If cost savings permitted, CRESA was given some discretion to include some

additional components. Several of the LOI-designated entities, in their approval of the full and of this narrowed *Science Plan* urged that the full plan be funded (see Appendix 1.B).

Since funding was not yet available, the only activity undertaken in the summer of 2003 involved visits by two CRESA researchers to several Aleut communities in the Aleutians to explain the *Science Plan*, listen to questions and concerns, and to acquire information about subsistence diets among the Aleuts. Modest pre-planning efforts and a review of the plan by the CRESA Review Committee was conducted (See Appendix 1.D) in the fall and early winter of 2003-4. After a series of administrative delays, CRESA was in February 2004 able to be sufficiently confident of having the adequate time and resources available to commit to moving ahead to execute the funded portion of the plan. It did so knowing it would have only a single field season and with the original goal of providing this report in 2005. A complex series of further project task specifications, scheduling, personnel definition and recruitment, expedition logistics management and the acquisition of needed permits for collection of biota culminated with the publication of the Amchitka Implementation Plan on CRESA's website (www.cresp.org) in the late Spring 2004 (see Appendix 4.H).

The plan called for a three-part expedition, two parts of which were to be carried out at Amchitka Island itself in June and July of 2004. Those two parts were to be carried out in two sequenced technical phases. The first phase focused on geophysical research on the island and marine environment designed to understand possible contamination pathways from the test sites. The second focused on biological sampling at Amchitka and at Kiska, a reference site further west in the Aleutians. Overlapping the timing of this second phase, CRESA sponsored a third expedition, placing a researcher to participate on a NOAA trawl in the western Aleutians with the goal of acquiring additional fish near Amchitka and Kiska, that might allow correlation of the NOAA catch with the main sampling results and possibly serve as a baseline for similar monitoring on future NOAA survey trawls.

The expeditions gathered valuable data on physical characteristics of the island substructure and its immediate marine environment, and the acquisition through diverse fishing, diving and other collection methods (including members of several Aleut communities) of some 4500 pounds of samples to enable analysis of carefully-specified diverse biota and biota types.

Beginning in August 2004 and continuing up to the preparation of this report, CRESA has been engaged in conducting radiologic analyses and an iterative and complex process of reviewing and interpreting the data acquired on the expedition. A team consisting of researchers and their laboratories from Rutgers University, Vanderbilt University, UMDNJ Robert Wood Johnson Medical School, the University of Alaska Fairbanks, University of Pittsburgh and the University of Alberta was assembled to carry out these tasks. Carefully developed quality assurance processes have guided every step of sample collection, preparation and analysis.

This report provides the background, results, discussions, and conclusions of CRESA's Amchitka Island research.

ABOUT CRESP

CRESP began operation in 1995 after receiving a competitive cooperative agreement from the Department of Energy and a successor effort, CRESP II was funded beginning in the fall of 2000, several months after CRESP agreed to work on Amchitka issues.

A key purpose of CRESP is to implement the 1994 National Academy of Sciences' recommendation that the Environmental Management Office of DOE enable the establishment of an independent institutional mechanism to develop data and methodology to make risk a key part of its decision making. (See *Building Consensus through Risk Assessment and Management of the Department of Energy's Environmental Remediation Program, NRC 1994*). Consistent with this purpose, the grant form of federal assistance for CRESP II provides independence from the granting agency. CRESP works to fulfill its mission by improving the scientific and technical basis of environmental management decisions that will:

- advance cleanup and other mechanisms that assure sustainably-protective risk management of the nation's nuclear weapons complex sites
- enhance stakeholders' participation in and understanding of the conditions at the nation's nuclear weapons facility waste sites.

CRESP pursues this mission through a unique institutional model:

1. Its primary mode of operation is an unprecedented program of interdisciplinary research carried out under the supervision of senior faculty at key university laboratories.
2. It is independent and its beneficiaries are solely the public and those who have a stake in effective cleanup of federal facilities;
3. It is organized to provide both guidance to and peer review of the evolving effort to utilize risk methods and evaluations to help guide decisions to assure sustainably-protective risk management at DOE sites.

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