



*The Inupiaq Learning Framework and the HERMYS model align since the traditional knowledge of the Inupiaq includes the integration of historical, social and natural sciences which recognizes complexity of SES (Social-ecological Systems) (<http://www.inupiaqheritage.org/our-culture>).*

### Applied Research Projects

**PolarTREC** for 2 years, 2013-2015, (<http://www.polar-trec.com/expeditions/historical-ecology-for-risk-management-2014>),

**TEACH** (Teachers of the Arctic Collaborating about Hazards) an initiative from 2016 with NSBSD as a research, practitioner, and teacher partnership for applied STEAM projects that includes community- based monitoring of erosion, risk education and preparedness.

**Community Based Beach Monitoring** of 6 Coastal Infrastructure about erosion and surges (fb @COBCBM, Coastal Observers of Barrow) with NSB EMO, Tuzzy Library, UAA and GMU coastal engineering, UAF permafrost monitoring, UVA GPR/ERT surveys, and AK Coastal Hazards using methodology of Alaska Corps of Coastal Observers and auto level surveys to assist forecast modeling. (<https://dgs.alaska.gov/hazards/coastal/monitoring-utqiagvik.html>)

**PERCIAS Applied Theater** (Perceptions of Risk, Communication, Interpretation, and Action in Social-Ecological Systems) with Global Change Center (<https://geography.vt.edu/people/bukvic.html>), Sara Cobb (<https://scar.gmu.edu/profile/view/5436>), and Chantal Bilodeau ([www.thearticycle.org/](http://www.thearticycle.org/)), using role plays, shadow puppet theater, creative drama, interactive scenarios, (e.g., script readings), disaster legends/storytelling, etc. to explore the RIA framework (<http://www.irdrinternational.org/projects/ria/>).

**Youth Habitat Corps** (YHC) with the US Fish and Wildlife Service, Ilisagvik College Cooperative Extension) about Arctic Gardens (Tundra, for Community and Home) for health risks, wellbeing, and food security,

**Risky Business** Camps and activities through NSB Risk Management and Tuzzy Consortium Library, Boys and Girls Club for 4-5 grades, MS, and HS.

**Community Archaeology** of Threatened Sites with UIC Science Cultural Resource Management

**Harmful Algae Bloom Community Based Monitors** (NOAA Phytoplankton Monitoring Network) Emerging hazards of algal bloom from changing environment on marine subsistence (<https://legacy.aos.org/alaska-hab-network/ahab-mission/>)

- **Preparing the Ark: Hazards and Animal Safety** (PAHAS) Outreach and survey methods to obtain community input about likely scenarios for domesticated animals prior to, during, and after emergencies in diverse ethnic populations to prepare realistic emergency plans. NSB RM, NSB Public Health Officer, Veterinary Staff and Joint Center for Disaster Research, NZ
- **Coastal Tundra for Heritage, Health, and Hazard Reduction** is participatory action by community monitors to study tundra migration, types, density, and its soil stability on a manmade berm to enhance surge protection through green engineering. NSB RM, UIC, and GMU Engineering (<https://civil.vse.gmu.edu/people/celso-Ferreira>).

## Applied Research in Environmental Sciences Nonprofit Inc. ARIES

### Mission

We are a research association promoting collaborative research, public education, and public outreach designed to enhance corporate and community-based decision-making.

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Photo Credits: Anne Garland, ARIES Research Associate

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## HERMYS NORTH SLOPE, AK.

*Historical Ecology for  
Risk Management:  
Youth Sustainability*



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## Historical Ecology Application for Risk Reduction

### What is Historical Ecology?

Historical ecology (HE) is an applied research program that focuses on interactions of people and their environments (social-ecological systems, i.e., SES) in both time and space to study its long term effects. Historical sciences are utilized to consider comparative SES, long term changes, and to extend baselines that can improve predictive capabilities ([https://en.wikipedia.org/wiki/Historical\\_ecology](https://en.wikipedia.org/wiki/Historical_ecology)).

HE research can be applied to community landscapes that assist land management strategies including cultural resources, environmental conservation, ecosystem services, and hazard mitigation. HE applications consider the SES dynamics of complex systems to learn about past strategies and outcomes.

Photo: August 4 2015 Surge impacting gravel sand berm & bags near critical infrastructure

## Emerging Approach: HERMYS

This emerging approach addresses historical ecology for risk management with “risks” among cultural resources, environment, ecosystem services, and hazards being mutually inclusive and interrelated. An integrated team expands as interrelated risks are realized with community partners and included in participatory research, educational activities, and public outreaches.

*Research gaps for risk reduction are driven by the varied community partners whether by region or locality.*

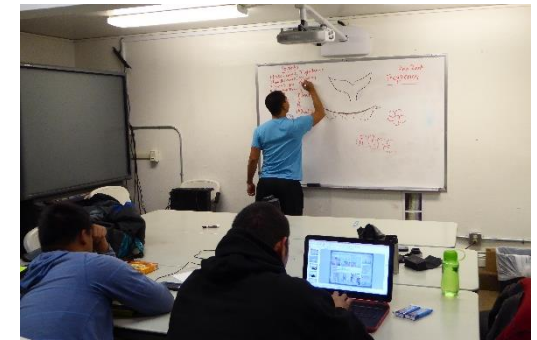
## Alignments of HERMYS: TEK and the Whole Community

The application of ecological heritage for risk and disaster management resonates with traditional ecological knowledge (TEK) across tribal inclusive geographic areas (TIGA ) and/or regional jurisdictions in the US and other countries. The recognition that the past can inform the present and future aligns with the whole community approach and its transdisciplinary outcomes to continually reduce risks of disasters (DRR). (<http://www.fema.gov/whole-community>).

## Alignments of HERMYS: 2015 Sendai Framework

With the 2015 Sendai Framework, the Preamble (7) calls for preventive risk reduction to be multi sectoral, inclusive of stakeholders, and “for the public and private sectors and civil society organizations, as well as academia and scientific and research institutions, to work more closely together and to create opportunities for collaboration.”

([http://www.preventionweb.net/files/43291\\_sendaiframeworkfordrrren.pdf](http://www.preventionweb.net/files/43291_sendaiframeworkfordrrren.pdf))



Risky Business Camp Summer 2015 : Risk Ranking Hazards & Teen CERT Poster for North Slope Recruits

## Whole Community Approach HERMYS Participatory Research & Services

Beginning in IPY 2007-2008 Applied Research in Environmental Sciences Nonprofit, Inc. (ARIES, [www.ariesnonprofit.com](http://www.ariesnonprofit.com)), North Slope Borough (NSB) Risk Management (<http://www.north-slope.org/departments/administration-finance/risk-management>), Tuzzy Consortium Library, UIC (Ukpeaġvik Iñupiat Corporation) Science for Cultural Resource Management, Cooperative Extension of Ilisagvik Community College and in 2014 the NSBSD (North Slope Borough School District), Instructional Coordination are collaborating to implement a historical ecology model for the North Slope Coastal Region of Alaska. Relevant researchers are recruited as risks are prioritized and funding becomes available. Researchers include coastal engineers, permafrost engineers, oceanographer, geographer, Arctic archaeologists, tundra ethnobotanist and dietician, relocation planner, and an applied anthropologist. The relevancy of the HERMYS model about the North Slope (whole community) guides the applied research for risk reduction activities with the varied stakeholders

