1. Objectives

This workshop has the following objectives:

1) **Assess agency (federal, state, NGO) needs:**
   - regarding wind/wave climatologies for AK, and
   - forecasts of the same.
   - Coordination with Hawaii: needs/efforts

2) **Assess present capacity:**
   - coastal wind/wave data availability, existing and planned
   - integration
   - modeling capability

3) **Identify target capacity to meet objective 1**

The agenda for the workshop has been organized with a “top down” approach. The first part of Day 1 will focus on strategic issues, including identification of agency requirements to establish overall project direction, major program initiatives that are relevant to this project, and broad, methodological mechanisms by which Hawaiian and Alaskan efforts may be linked. The latter part of Day 1 and Day 2 will focus on technical issues, to arrive at an assessment of where current technology stands as it applies to this project. The last day will deal with summarizing what was learned during the workshop to establish directions for the full climatology development initiative.

2. Rationale

Alaska and Hawaii have long coastlines and an attendant dependence on activities on and around these coastal margins. In these areas ocean waves are of major interest because they physically impact the coast, the nearshore bottom zone, and structures in and around coastal waters. Waves are (usually) driven by wind, as are surges in sea-level; thus strong wind events, specifically storms, are also of interest. At finer scales of resolution modification of waves by bathymetry, coastline orientation, and the presence of ice in the marine and terrestrial environment occur.

In addition to close marine/marine weather associations inherent in the Alaskan and Hawaiian outlooks, there has been a surge of activity within the last few years that articulates risk and potential opportunities to coastal and near-coastal regions due to climate change, especially those situated in the arctic. Major reports and meetings represent a spectrum interests and have been assembled by a wide range of international
consortiums and US state and federal agencies. The following table provides a cross-
section of activity:

<table>
<thead>
<tr>
<th>Report</th>
<th>Year</th>
<th>Focus region</th>
<th>Agency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arctic Marine Transport Workshop</td>
<td>2005</td>
<td>Circum-arctic</td>
<td>Institute of the North, US-ARC, IASC</td>
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<tr>
<td>Arctic Coastal Dynamics Project: annual reports, GeoMarine Letters special volumes</td>
<td>2005 (annual back to 2000)</td>
<td>Circum-arctic</td>
<td>IASC, IPA, IARC</td>
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<tr>
<td>Arctic Climate Impacts Assessment (ACIA)</td>
<td>2004 (full report due 2005)</td>
<td>Circum-arctic</td>
<td>IASC</td>
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<tr>
<td>Alaska Native Villages: Villages affected by flooding have difficulty qualifying for federal assistance</td>
<td>2004</td>
<td>Alaska</td>
<td>US GAO</td>
</tr>
<tr>
<td>Committee Field Hearing on Alaska Native Villages Affected by Flooding and Erosion</td>
<td>2004</td>
<td>Alaska</td>
<td>US Senate Committee on Appropriations</td>
</tr>
<tr>
<td>Study of the North Alaskan Coastal System (SNACS) call for proposals</td>
<td>2004</td>
<td>Alaska</td>
<td>NSF OPP</td>
</tr>
</tbody>
</table>

IASC – International Arctic Science Committee
GAO – US General Accounting Office
US-ARC – US Arctic Research Commission
AOOS – Alaska Ocean Observing System
RISA – Regional Integrated Sciences and Assessments (NOAA)
MMS – Minerals Management Service
IPA – International Permafrost Association
IARC – International Arctic Research Center (UAF)
NSF – National Science Foundation
OPP – Office of Polar Programs

NOAA is interested in moving ahead with a project, identified under the Integrated
Environmental Applications and Information Program for the Pacific, that will support an IPY
prototype project that will arrive at a new level of operational wind/wave climatology and
forecasting capacity for the Alaska and Hawaii regions. This workshop is part of a
scoping project that is tasked with providing relevant preliminary deliverables to the
larger project.

Interest in this broad issue varies along a number of dimensions, including physical
processes considered, time scale, spatial scale, geographic location, and end result. This
has resulted in the existence of various, often poorly coordinated studies and data sets
that have focused on many aspects of these systems. In order to proceed with the broad
project objectives in the most efficient manner possible, this workshop has defined the
objectives listed above and seeks to discharge these tasks by assembling a group of
directors and experts representing various aspects of this topic.

Regarding objective 1), agency needs must be identified, and specifically in terms of
implementation, because they provide the framework within which proposed climatology
and operational/forecast projects must operate. This objective also covers coordination between similar efforts in the Alaska and Hawaii regions by identifying areas of overlap in capacity and need. An assessment of present capacity 2) must be undertaken because existing activity and research results must be accounted for and brought to bear, to avoid duplication of effort. This is an involved component, covering three main target areas and their associated permutations:
  a) data availability, observational and modeled, for various locations and spatial/temporal scales.
  b) modeling capability – refers to existing models available to perform dedicated runs targeting specific needs, e.g. modeling a particular storm
  c) integration – this refers to applications of data beyond its disciplinal boundaries, e.g. wave energy data feeding coastal erosion models

The final objective 3) addresses the next logical step, which is to match identified capacity and gaps with needs and begin thinking about implementation of existing capacity, or for gaps, commissioning the necessary work required to fill the gaps.

3. Workshop outline

Sessions:

Day 1 (Aug 2): Strategic Issues
Targets:
  > Define and identify the users of the climatology
  > Define products/research results of interest
  > Identify areas/mechanisms of Hawaii/Alaska region integration

A) User needs
  1) Who are the users (e.g. agencies, producers/providers of services)?
  2) What are the specific parameters or products of interest?
  3) What are the time, space, and resolution scales required?
  4) Future requirements (e.g. expansion to other parts of Arctic)
  5) Hawaiian needs

B) Data session A: Major sources of data (existing and needed)
  1) Buoy programs
  2) CRN
  3) Satellite initiatives
  4) New model sources (e.g. US Arctic Reanalysis)
  5) Links to Hawaiian developments/initiatives

Day 2 (Aug 3): Technical Sessions
Targets:
  > Assess current state of knowledge in relevant areas
    - modeling issues
- data availability

A) Integration issues
   1) Downscaling
      a. Applications
         i. Reanalysis forcing
         ii. GCM forcing for prediction scenario work
      b. Potential approaches
   2) Applications (i.e. model results driving other systems)

B) Data session B: Operational details
   1) Observational data
      a. Land based atm. (surface, upper air, CRN)
      b. Marine (SST, waves, sea ice)
      c. Global gridded sets, e.g. CRU
      d. Terrestrial non-atm (e.g. permafrost, coastal erosion)
   2) Modeled data
      a. Global reanalyses (NNR, ERA, FNOC)
      b. Large regional reanalyses (NARR, HIRHAM, others in ARCMIP project)
      c. Small regional runs (e.g. MM5 archived at UAF, SHEBA)
      d. Forecast data (e.g. IPCC, ACIA model runs)

C) Models (defined as “models that could be run within the context of a project”, i.e. unlike IPCC runs which are fixed)
   1) Regional atm models
   2) Wave models
      a. Coupled
      b. Non-coupled
   3) Erosion models

Day 3 (Aug 4): Summary assessment
Targets:
> Collate and distill; flesh out report skeleton

A) Wrap-up
   1) Identify gaps
   2) Identify solutions
   3) Determine report structure that Atkinson will flesh out
   4) Set the stage for completing the rest of the scoping project deliverables.