Lichens and other tundra or boreal plants could absorb significant amounts of radionuclide fallout in an event of a nuclear accident. This is a concern for the indigenous residents who practice a subsistence lifestyle.

**Updated Monitoring Tower**

**Wind Sensors:** Met One Wind Finder System
- Anemometer cup (Model 6266)
  - Range: 0-100 mph
  - Temperature Range: -50 to +85 degrees Celsius
  - Precision: +/- 0.25 mph or 1.5%
- Wind vane (Model 037)
  - Range: 0-360 degrees
  - Temperature Range: -50 to 70 degrees Celsius
  - Precision: +/- 8 degrees
- Air Temperature: Met One (Model 064-2) with solar shield
  - Range: -50 to +50 degrees Celsius

**Relative Humidity:**
- Rotronic Hygrometer (Model Series 200)
  - Range: 0 to 100% Relative Humidity
  - Temperature Range: -20 to +100 degrees Celsius
  - Precision: +/- 2%/67-87 degrees Fahrenheit

**Barometric Pressure:**
- Met One (Model 090D)
  - Calibration Range: 26-32" Barometric Pressure
  - Calibration Accuracy: +/- 5% of Cs 137 exposure @+20 degrees Celsius

**Gamma Radiation:** RADOS Dual Geiger-Mueller Detector (Model RD-02L)
- Range: 0.01 microSv/h to 10 microSv/h
- Calibration Accuracy: +/- 5% of Cs 137 exposure @+20 degrees Celsius
- Temperature Range: -40 to 70 degrees Celsius

**Lichen Radionuclide Baseline Research**

ORION interns worked on a variety of student research activities including a lichen radionuclide survey.

**Reasons ORION was Started**

Long-term meteorological and radiological observations will provide a baseline against which any major changes in atmospheric conditions and radioactivity can be detected.

The former Soviet Union’s nuclear plant at Bilibino, which is close to Alaska (2173 km), was a concern regarding radiation fallout in case of a nuclear accident. The atmospheric trajectory models for the period 1991-1995 suggested transport pathways probabilities [1]:

<table>
<thead>
<tr>
<th>City</th>
<th>Probability</th>
<th>Average Time</th>
<th>Shortest Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anchorage</td>
<td>2%</td>
<td>2-3 days</td>
<td></td>
</tr>
<tr>
<td>Nome</td>
<td>17%</td>
<td>5.3 days</td>
<td>1.5 days</td>
</tr>
<tr>
<td>Barrow</td>
<td>11%</td>
<td>5.1 days</td>
<td>1.5 days</td>
</tr>
</tbody>
</table>

Atmospheric transport from Europe and the Kola nuclear plant is possible, but with low probability and low concentrations there is no apparent serious threat [2].

**Data Collection**

The sensor data are collected, processed, and stored on a Campbell Scientific CR10x data logger. The data are transmitted via radio frequency to a base station located at the Barrow Arctic Science Consortium (BASC). A computer at the University of Alaska Fairbanks is used to connect to the base station and download data from station. The data are loaded into a database that is accessible by the public via the internet at http://www.ims.uaf.edu/orion. While the sensors are not calibrated and the data is not checked for quality assurance, the information provided is still useful to the general public and scientific groups.

**References:**


**Tutorials**

ORION interns, with University of Alaska faculty assistance, are producing a series of tutorials on environmental radioactivity. These tutorials are based on Radioactivity Releases in the Environment: Impact and Assessment, include a history of radioactivity, basic concepts and definitions of radiation, nuclear power and weapons, health and waste issues and methods of measurements. The power point tutorials are designed for public presentation.

**Participating**

*University of Alaska Fairbanks, Anchorage, Alaska 99775, USA.*

http://www.ims.uaf.edu/orion

http://www.aises.org

**AISES**

The American Indian Science & Engineering Society is a private, non-profit organization which nurtures building of community by bridging science and technology with traditional Native values. Through its educational programs, AISES provides opportunities for Alaska Natives and American Indians to pursue studies in science, engineering, technology and other academic areas. These graduates will be able to assume roles in which Native leaders manage and develop their lands and resources. The URL for the AISES website is http://www.aises.org. The URL for the UAF chapter of AISES is http://www.uaf.edu/aises. The ORION program is an official AISES project.

**Participants:**

*School of Fisheries and Ocean Sciences, UAF*

*Institute of Marine Science*

*Rural Student Services, UAF*

*Department of Electrical Engineering, UAF*

*Alaska Department of Environmental Conservation*

*Les Asleurs National Laboratory*

**Sponsored By:**

*Netel-Pacific Northwest National Laboratory, Richland Washington, Contract Number 9064*

**Acknowledgments:**

*Bar McHenry*

*This paper is presented in memory of Larry Sanders, Les Asleurs National Laboratory*