

# Neighborhood Environmental Watch Network

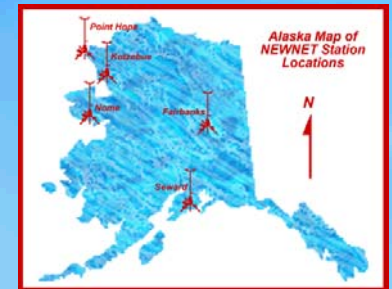
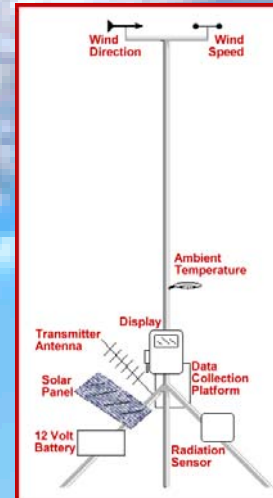
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**Abstract** The Neighborhood Environmental Watch Network (NEWNET) project extends as far north as Alaska. There are five NEWNET monitoring stations located throughout Alaska, including one located on the University of Alaska Fairbanks (UAF) Campus. At UAF, many students have been learning about the NEWNET project, in particular, a group of students that form a local college chapter of the national organization called the American Indian Science and Engineering Society (AISES). Formed in 1976 by a group of American Indian scientist and engineers, the National AISES organization is a private, non-profit organization, which nurtures building of community by bridging science and technology with traditional native values. NEWNET is one of the many projects that the nationally recognized UAF chapter of AISES is involved in. The student involvement in the NEWNET project extends to the communities surrounding the stations as well. Some of the stations utilize volunteer station managers that live in the area that the data is gathered. These station managers are trained in the operation of the station components and can perform basic maintenance procedures and act as a liaison to each community.

**Introduction** Although nuclear power is known to be one of the safest, most reliable and cost effective sources of energy, it is not without its criticisms. The release of radioactivity and the resultant contamination is a concern that many residents of the US have learned to associate with nuclear energy. The nuclear weapons programs have suffered much of the same public dissension that seems to accompany any nuclear technology. To combat such mistrust and misunderstanding, a program was initiated called the Neighborhood Environmental Watch Network (NEWNET). NEWNET provides the opportunity for the general public to monitor our environment, specifically the atmospheric conditions. This is accomplished through a network of meteorological and radiological monitoring stations that collect environmental data and transmit via satellite to a processing location where it is ultimately published on the Internet (<http://newnet.lanl.gov>). The NEWNET program has domestic as well as international implications. Within the circumpolar north, there exists perhaps a more tangible radiological threat to US soil. In the former Soviet Union, the use of nuclear power is still in heavy use. The reactors in use, however, are of a somewhat dated design similar to the Chernobyl reactor. The geographical proximity of Bilibino, Russia, which utilizes such a reactor, to Alaska underscores the threat of transportation of fallout to US soil. To address this potentially hazardous situation, NEWNET has extended its monitoring program to Alaska. Students at the University of Alaska Fairbanks (UAF) are involved with the success of the NEWNET program in Alaska.

**NEWNET Stations** The towers, which are the most visible part of the NEWNET project, are of a rather simple design. Although there are several configurations, nearly all are made using an aluminum frame. Their design which has been improved as the project has expanded, is illustrated in the figure below. Data gathered by the stations include wind speed and direction, ambient temperature, humidity, barometric pressure, and gamma radiation. The sensors responsible for each data product, are changed twice a year with calibrated units except the gamma sensor, which is changed annually. Sensor rotation is one of the tasks that students perform regularly. The information gathered by the sensors is summarized into 15 minute averages and is transmitted every four hours via satellite to Wallops Island Virginia. The data is then retransmitted to a receiving station in Los Alamos, New Mexico via DOMSAT (Domestic Satellite). It is then interpreted and made available over the Internet. Most stations are completely autonomous using solar panels to charge a 12 volt battery for power storage. Some, however use 120 volt AC power supplied near the respective station. The 5 NEWNET stations in Alaska are distributed on the map below. The NEWNET stations in Alaska are unique with respect to the extreme environments they must operate in. Temperatures can range from around 100°F to around -65°F! In addition to the extreme fluctuation in ambient temperature between seasons, the amount of light available for solar power throughout the year fluctuates considerably as well. Finding solutions to these environmental issues are some of the challenges that students at UAF are involved in.



## The University of Alaska

**Fairbanks** (UAF) students are recruited into the NEWNET project through the American Indian Science and Engineering Society (AISES) in Fairbanks Alaska. Through its educational programs several students have been exposed to many opportunities in science, engineering and other academic areas such as internships at the Los Alamos National Laboratory (LANL). Through National AISES, seven students

over the past three years have been introduced to the NEWNET project at LANL. Three of them were introduced through their involvement with the UAF chapter of AISES in Alaska. The UAF chapter of AISES hosts guest speakers from a variety of science and engineering fields. Other meetings are used to allow students to share some of their internship experiences. These meetings help to encourage the participating students to connect with the native and non-native professionals who volunteer their time to the gatherings.



**Student Responsibilities** include: Rotation of NEWNET station sensors, troubleshoot and repair station if system experiences difficulties, perform data quality analysis of information gathered by the stations, web page work including design, updates, and inspection for anomalies, and work with mentors to learn technical processes and procedures. Most of these procedures are performed under the guidance of a member of the NEWNET professional staff.

**Conclusions** Through my involvement with the UAF chapter of AISES, I was able to intern at UAF and learn about the NEWNET project. Under the supervision of Dr. John Kelly, I began learning about the NEWNET projects' implications to Alaska and the rest of the United States. I was able to travel to Kotzebue and Nome, Alaska to work on the NEWNET stations that are in operation at each location. With this experience I became interested in traveling to LANL where the NEWNET project is based. I learned of the possible internship opportunity at LANL from a previous LANL intern that presented her experience at an AISES meeting. AISES was a key component in the chain of events that led to my internship at LANL. The incorporation of AISES students into the NEWNET project has benefited both parties in many ways. While the students gained technical experience they helped the NEWNET program progress into the community through involvement.

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