

US Fish & Wildlife Service FieldNotes

SELAWIK: Hosts Climate Change Monitoring Project as part of Global Research Network

Region 7, September 29, 2010



Figure 1. Hockley Hills site 2 (elevation 385 m), one of the four mountain peaks that form the GLORIA Selawik NWR target site, Alaska. Talbot (USFWS) photo, 23 July 2010. - Photo Credit: n/a

GLORIA, the *Global Observation Research Initiative in Alpine Environments*, is an initiative towards an international research network to assess climate change impacts on mountain environments. In July 2007 the first GLORIA study area to be set up in Arctic North America was established in Selawik National Wildlife Refuge (NWR) in the Hockley Hills of



Figure 2. Laszlo Nagy (University of Vienna) recording plant cover data in a 3m x 3m quadrat cluster in the Hockley Hills of Selawik NWR, Alaska. Talbot (USFWS) photo, 11 July 2007. - Photo Credit: n/a

the eastern Waring Mountains. This "target area" comprises a mountain area in which four summit sites, representing the regional elevational gradient, are located. Realizing that Earth is currently experiencing rapid climate change, the staff at Selawik NWR undertook to fund the project.

Climate change affects all ecosystems, but alpine ecosystems (high mountain environments above tree line) are particularly sensitive to warming, because they are determined by low temperature conditions. The purpose of GLORIA is to establish and maintain a global long-term observation network compare the effects of climate change on mountain biota across the planet.

High mountain environments are found globally from the tropics to the polar regions and host an outstandingly diverse and highly specialised flora. There is concern that accelerating climate warming threatens this unique biodiversity. Because high mountain plants are dependent on low temperatures to survive, and are on mountaintops, they have no place to go from an elevational standpoint. GLORIA's multi-summit approach was designed as a fairly inexpensive method for monitoring high mountain plants with methods applicable and places around the globe.

In 2007 scientists established the GLORIA Target Site by placing data logging instruments to record hourly soil temperatures, established vegetation plots where they took measurements of plant cover and frequency. In July 2010, a team of scientists returned to Selawik NWR to monitor the target area. The research team included Drs. Laszlo Nagy (GLORIA scientist from headquarters at the University of Vienna, Austria), Sandra Talbot (USGS Alaska Science Center, Anchorage), and Stephen Talbot (USFWS, Anchorage).

Over a 3-week period, the team re-measured the vegetation plots, downloaded temperature data, and replaced the data loggers with new loggers. The new loggers have a longer life span and should last five years when the sites will be monitored again in 2015. During the coming winter months, the data will be uploaded to the central depository at the University of Vienna. Initial results indicate little change in the past three years.

The Conservation of Arctic Flora and Fauna (CAFF) program under the Arctic Council is an intergovernmental organization that includes Canada, Denmark (including Greenland and the Faroe Islands), Finland, Iceland, Norway, Russian Federation, Sweden, and the United States of America. It should be noted that the lead agency for the United States is the Alaska Region of the U.S. Fish and Wildlife Service. The CAFF National Representatives saw the importance of GLORIA and supported the development of a network of northern sites within each nation. Consequently the CAFF Flora Group worked to engage a number of other countries in the GLORIA network. Several countries are now newly added to the GLORIA; these are Faroe Islands, Greenland, and Iceland. Interest has been expressed for sites in northern Canada and Svalbard (Norway) and a number of sites already exist in Sweden and the Russian Federation. Since there is high similarity in the climate and floras of the region, the comparative value between sites is correspondingly high.

Shortly after Selawik NWR launched GLORIA monitoring sites, Janet Jorgenson in the Arctic NWR established a GLORIA program in 2008 and will follow-up with monitoring in 2011.

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