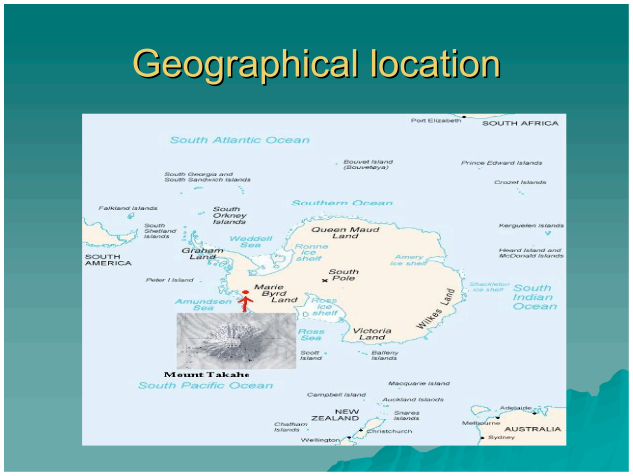
Research Proposal
Paula Gardner's Third and Fourth Grade Science Classes
Connally Elementary, Waco, Tx

Our third and fourth graders have chosen Mount Takahe volcano and other buried volcanoes in Western Antarctica as the ice feature we want to research further.

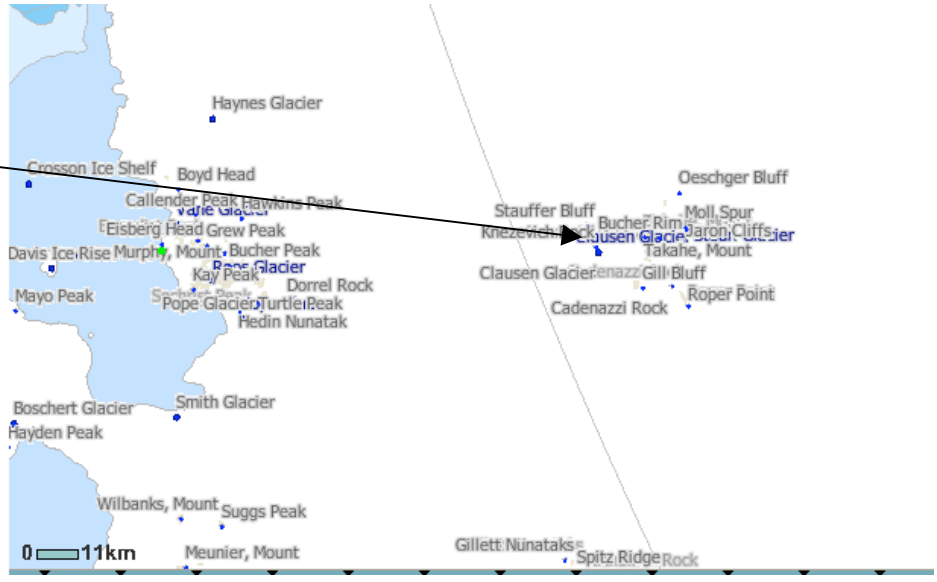
A large, isolated snow-covered mountain (an extinct volcano) standing 40 mi SE of Toney Mountain in Marie Byrd Land. It is roughly circular, 18 mi across, and rises to 3,400 meters. This mountain was probably among those viewed from a distance by Admiral Byrd and other members of the USAS in plane flights from the ship Bear on Feb. 24 and 25, 1940. It was visited in December 1957 by members of the Marie Byrd Land Traverse Party, 1957-58, who applied the name. "Takahe," the Maori name for a flightless, almost extinct New Zealand bird, is the nickname of the U.S. Navy LC-47 aircraft whose crew resupplied the traverse party near this mountain and assisted by providing aerial reconnaissance to locate passable routes. (http://geonames.usgs.gov/pls/gnispublic/f?p=105:3:8597733731996127::NO::P3_ANTAR_ID:14967)

Coordinates: 76.2 °S, 112°W



site: file:///C:/Documents%20and%20Settings/pgardner/Local%20Settings/Temporary%20Internet%20Files/Content.IE5/MUNAJGKP/stoica%5B1%5D.ppt#257,2,Geographical location

Mount Takahe and surrounding glaciers



Reasons to study Mount Takahe:
The West Antarctic Ice Sheet is the most rapidly changing ice sheet in Antarctica. Studying the effects of volcanic eruptions on that ice sheet will yield valuable information about the effects on sea-level rise, on the speed at which glaciers on the ice sheet will move, and the relationship between volcanic activity and global warming. Our questions are:

1. Would an eruption of Mount Takahe cause a substantial melting of the snow and ice surrounding it and, if so, how much of an effect would there be on the level of the oceans surrounding Antarctica?
2. How far from Antarctica would the effect on sea-level rise be significant?
3. How will the speed of glacial movement on the West Antarctica ice sheet be affected by a volcanic eruption?

Hypothesis:

1. Melting of ice and the Clausen Glacier, Steuri Glacier and other glaciers around Mount Takahe will result in the ice mass of Antarctica to decrease.
2. An eruption of Mount Takahe will increase the speed at which these glaciers on the West Antarctic Ice Sheet move.
3. Sea-level rise that may occur as a result of an eruption of Mount Takahe will affect the oceans surrounding Antarctica but will have a lessening effect on the sea-level of oceans farther from Antarctica.

We suspect that, although Mount Takahe and other volcanoes on the West Antarctica Ice Sheet have remained dormant for thousands of years, the geologic processes which lead to volcanic eruptions may be causing the release of heat beneath the ice sheet, causing melting to occur. This melting causes the movement of the glaciers to increase, impacting the ice sheet and potentially affecting the sea-level rise.

Funding:
Our continued research will involve collecting data about the volume of ice of the areas surrounding Mount Takahe, the depth of the ice mass on the West Antarctic Ice Sheet from the Amundsen Sea to Mount Takahe, the recorded speed of the glaciers on and near Mount Takahe for the past 4 decades, and the current level of the oceans off the coast of West Antarctica. Dr. Wagner suggested that we study subglacial volcanic eruptions in Iceland and the effect flowing water has on glaciers. In our lab investigation we conducted, we discovered that a lubricated surface (like flowing water) causes cold materials to flow more quickly and that the entire width of the materials did not flow at the same speed. We would like to investigate further to determine if what we witnessed in the lab and what we learned about the volcanic eruptions in Iceland will have similar effects in Antarctica. Dr. Bindschadler asked if there were other volcanoes. West Antarctica has many other volcanoes and we feel that researching Mount Takahe will provide valuable information about the effects of eruptions from those volcanoes might have as well. We know that satellite imagery has been useful in studying volcanoes in other areas so we feel that the use of LIMA and other satellite imagery will prove useful in our further investigation.