



Overview:

Students will use the University of Alaska's Web-based Geographic Information Network of Alaska (GINA) to study events related to Alaska's changing climate. They will then use the Google search engine to further research these events and explain how they may relate to, or affect, Alaska's climate.

Objectives:

The student will:

- use the Internet to access GINA;
- navigate the GINA site;
- study satellite images of Alaska weather events, volcanic activity, and fires;
- research these events online; and
- answer questions to explain their relationship to Alaska's climate.

Materials:

- STUDENT WORKSHEET: "GINA Over Alaska"
- Computer with Internet access

GLEs Addressed:

Science

- [9] SA1.1 The student demonstrates an understanding of the processes of science by asking questions, predicting, observing, describing, measuring, classifying, making generalizations, inferring, and communicating.
- [10-11] SA1.1 The student demonstrates an understanding of the processes of science by asking questions, predicting, observing, describing, measuring, classifying, making generalizations, analyzing data, developing models, inferring, and communicating.

Activity Procedure:

Explain that students will use GINA to study satellite images of storm systems, large fires, volcanic eruptions, sea ice movements, and much more. Students will use GINA to study recent weather, fire, and volcanic events in Alaska. They will then do a Google search to learn more about these events and answer questions about each event. As a class, navigate GINA to study each of the following events, using the specific instructions listed after each event below:

Event No. 1: The 2004 Fire Season

- Step 1: Open up the GINA Web site at: www.gina.alaska.edu.
- Step 2: Click on the image above **CURRENT ALASKAN IMAGES** on the left side of the page.
- Step 3: Select **2004 MODIS Images** from the list on the left side.
- Step 4: Click on **June and July fire images available here**.
- Step 5: Scroll down through the images to locate the June 20, 2004 and July 1, 2004 **Smoke Map from Alaska Fire Service**.
- Step 6: Click on these images to study the fires in Interior Alaska.
- Step 7: Click on **GINA Home** to return to the main page.
- Step 8: Under **FEATURED IMAGE**, click on **Featured Image Archive** and scroll down to see the image of the fires north of the Sheenjek River near Fort Yukon. Click on the image to study it closely.

- Step 9: Return to **GINA Home** and double-click on **SwathViewer** on the upper right.
- Step 10: Click on **magnifying glass** at the upper left and center it over Alaska.
- Step 11: Click on Alaska to enlarge it enough to just fill the screen.
- Step 12: Under the **linework** folder listed on the left side of the page, click on the **Misc** folder and scroll down to select **US Cities**. If the folder is not visible, click on the circle beside the folder name to expand it.
- Step 13: Under the **Images** folder on the upper left, scroll down to select **Terra-1/MODIS** and then click on the 2004 folder.
- Step 14: Click on the following dates and times, which show images of the Alaska fires in 2004:
- | | |
|------------|--------------|
| 2004-06-24 | 21:29:14 GMT |
| 2004-06-29 | 21:47:35 GMT |
| 2004-08-16 | 21:47:23 GMT |
- Step 15: Zoom in on the images with the magnifying glass to study the fires closely.

Event No. 2: The January 2006 Eruption of Augustine Volcano

- Step 1: Click on **GINA Home**.
- Step 2: Under **FEATURED IMAGE**, click on the images of the 2006 eruption of the Augustine Volcano and the **Augustine Volcano Eruption Animation**.
- Step 3: Close the animation window to return to the GINA home page.
- Step 4: Under **FEATURED IMAGE**, click on **Featured Image Archive** and scroll down to see the image of the Augustine eruption. Click on the image to enlarge it.
- Step 5: Scroll down through the images to locate the June 20, 2004 and July 1, 2004 **Smoke Map from Alaska Fire Service**.

Event No. 3: Bering Strait Storm of September, 2005

- Step 1: Click on **GINA Home**.
- Step 2: Click on the image above **SwathViewer** on the upper right.
- Step 3: Click on **magnifying glass** at the upper left and center it over Alaska.
- Step 4: Click on the Bering Strait region to enlarge it enough to just fill the screen. If needed, click on the Pan tool at the top of the screen then click and drag to move the image.
- Step 5: Under the Linework folder listed on the left side of the page, click on the Misc folder and scroll down to US Cities.
- Step 6: Under the Images folder on the upper left, scroll down to select Terra-1/MODIS and then select the 2005 folder.
- Step 7: Click on the following dates and times to see how the storm took shape and swept over the Bering Strait in September, 2005. You may need to scroll to the right to see the dates and times. Click on the dates to view the images.

2005-09-20	23:45:53 GMT
2005-09-21	22:29:42 GMT
2005-09-22	21:34:39 GMT
2005-09-22	23:12:42 GMT
2005-09-23	23:55:23 GMT
2005-09-24	23:00:30 GMT
2005-09-25	23:42:13 GMT
2005-09-26	22:48:06 GMT

Ask students how each of these events may be related to climate change. Prompt classroom discussion by asking why the fires of 2004 were so extensive (effects of warmer, drier weather); how volcanic eruptions affect the atmosphere (the release of carbon dioxide and other greenhouse gases into the air); and why severe fall storms on the Bering Sea seem to occur more often now (warmer ocean temperatures produce hurricane-like events).

Hand out the STUDENT WORKSHEET: "GINA Over Alaska" and ask students to complete the worksheet. Explain that they will use the Internet to discover more about these events and hunt for answers to questions on the worksheet.

Note to teacher: Students are likely to find different answers to the questions on the worksheet. They should record the answers they find and write the URL (Web site address) where their answer was found. After completing the worksheet the class can share their information, discuss why some Web sites may present different information, and share ideas on how to select the most reliable and complete information.

Answers:

1. a) 6.59 — 9 million acres (depending on source)
b) lightning strikes or human caused (depending on source)
c and d) answers will vary
2. a) Newtok, Nome, Golovin, and Unalakleet (depending on source)
b) low pressure systems
c) 56-83 mph (depending on source)
d and e) answers will vary
3. a) Cook Inlet, west of Homer
b) answers will vary
c) carbon dioxide, sulfur dioxide, nitrogen, hydrogen, carbon monoxide, sulfur, argon, chlorine and fluorine (answers will vary)

Name: _____

GINA Over Alaska

Student Worksheet (page 1 of 3)

Levels V-VI



Directions: Use the Google search engine to learn more about Alaska's 2004 fire season, storms in the Bering Sea, and the Augustine eruption.

Enter <http://www.google.com> to open the Google Internet search engine. In the blue box, type in the phrases suggested below and select the Google Search button.

1. Learn about the 2004 Alaska fire season and answer the questions below by "Googling" these phrases:

"2004 fire season Alaska"

"Alaska fires 2004"

a. How many acres burned in Alaska in 2004? _____

Internet source: <http://>_____

b. What caused most of the fires? _____

Internet source: <http://>_____

c. What climate factors led to such an intense fire season?

Internet source: <http://>_____

d. Share one other interesting fact from this Google search:

Internet source: <http://>_____

Name: _____

GINA Over Alaska

Student Worksheet (page 2 of 3)

2. Learn about the September 2005 storm in the Bering Sea by “Googling” these phrases:

“Bering Sea storm September 2005”

“Cause of Bering Sea September 2005 storm”

“Nome storm 2005”

a. What villages were affected by the September 2005 storm on the Bering Sea?

Internet source: <http://> _____

b. What kind of pressure system causes these big storms? _____

Internet source: <http://> _____

c. How fast were the winds from this storm? _____

Internet source: <http://> _____

d. What climate conditions caused this storm?

Internet source: <http://> _____

e. Share one other interesting fact from this Google search:

Internet source: <http://> _____

Name: _____

GINA Over Alaska

Student Worksheet (page 3 of 3)

3. Learn about the recent eruptions of Augustine Volcano in Southwestern Alaska by “Googling” these phrases:

“Augustine eruption”

“Augustine volcano”

a. Where is the Augustine Volcano located?

Internet source: <http://> _____

b. When was the last Augustine eruption? _____

Internet source: <http://> _____

c. What greenhouse gases are released when Augustine erupts?

Internet source: <http://> _____

d. Share one other interesting fact from this Google search:

Internet source: <http://> _____