

Watching Walrus Teacher Guide

Grade Level: 5th-8th

Time needed: 6-8 one-hour class periods.

Nutshell: Students will gain experience designing a scientific research plan while learning about an actual research project studying Pacific walrus in Alaska.

Objectives:

After completing this virtual field trip students will be able to:

- Describe how the research plan they develop meets the objectives set out by SeaLife Center scientists.
- Explain how Arctic animals, like Pacific walrus, may be impacted by decreased availability of sea ice.
- Locate geographic features of the Arctic and subarctic oceans using a world map.

Background for teachers:

Pacific walrus are a marine mammal species native to the Bering and Chukchi Sea area between Alaska and Russia. A member of the pinniped (fin-footed) family, walrus are ocean bottom feeders that can weigh up to one and a half tons. Walrus live along the continental shelf where water is shallow and food resources are plentiful. Floating sea ice provides females and calves with access to varied food resources, protection from predators and isolation from disease. Though walrus are a social, gregarious species (males are known to haul-out together in large numbers), females with calves usually stay separate from the herd, depending on sea ice for their haulouts.

As a consequence of warming Arctic climate, scientists have observed that sea ice in the Arctic Region is shrinking. This means decreased habitat for Pacific walrus, particularly for vulnerable populations like females with calves. As a result of these changes in habitat, walrus have been observed hauling out on land in numbers rarely seen before. Not only does this make populations more susceptible to disease, predation and depletion of food resources, it also means moms and calves are living in herds rather than alone.

Walrus are known to abandon a haulout upon disturbance (ex: by presence of boats, people etc.). In such cases, walrus move quickly from land into water. As walrus are observed gathering in large groups (as many as 14,000 walrus have been observed hauling out together) scientists are concerned about the increased consequences of such disturbances. Instances of stampede have been recorded, including that at Icy Cape (described in Watching Walrus), leaving hundreds of animals dead. Such events led scientists



at the Alaska SeaLife Center to begin research observing Pacific walrus. Their intention is to increase understanding of what causes these animals to abandon a haulout. They are particularly interested in how patterns in walrus response differ between established land haulout outs and newly emergent ones.

The research of lead Marine Mammal Scientist Dr. Lori Polasek, Marine Mammal Research Associate Jill Prewitt, and Research Coordinator Terril Efird inspired this virtual field trip. Join us as we explore some of Alaska's most remote coastline, and work to learn more about how sea ice loss is impacting Pacific walrus.

Throughout their exploration of Watching Walrus students will engage in discussions, make observations, complete a research map and design their own research plan for observing walrus as they use land haulouts.

Lesson Outline:

To use this virtual field trip you will need:

- Internet access, video-streaming capabilities
- Access to **Watching Walrus** the virtual field trip (available on the Education Page of alaskasealife.org)
- Projection system (with audio) to display VFT content or computer lab if preferred.

Teachers may choose to have class navigate through Watching Walrus as one large group, using projection system to display content, or have students work independently in computer lab setting. All activities included with curriculum supplements work best in a classroom setting with tables arranged into small groups.

Curriculum supplements include complete directions and materials for classroom activities to accompany each section. They are available as pdfs in the right-hand column of the FOR TEACHERS section of the VFT.

Activities are designed to meet AK State & National Content Standards.

Day One:

VFT sections to complete: Introduction and Meet the Scientists (30 minutes)

Focus Questions:

How do land and sea ice walrus haulouts differ?

What happens when walrus are disturbed at a haulout?



Activities:

Abandoning A Haulout (15 minutes)

Beginning Your Research Map (15 minutes)

Overview: Students are introduced to this VFT through the true story of a walrus stampede in the Arctic in 2009. This event got scientists from the Alaska SeaLife Center asking questions and inspired them to become involved in studying walrus populations in Alaska. In the Introduction Section students learn what a haulout is, and how lack of available sea ice is impacting walrus behavior. The *Abandoning A Haulout activity* associated with this session focuses on solidifying student understanding of how land and sea ice haulouts differ and how this impacts walrus at these sites by giving students a chance to act out different haulout scenarios. The *Research Map activity* will be expanded on throughout this VFT. In this activity your class will add relevant geographic features to a map of Alaska on display in your classroom.

AK Science Content Standards Addressed:

6th Grade: SA1.1

7th Grade: SA1.1

8th Grade: SA1.1

Day Two:

VFT section to complete: Background (30 minutes)

Focus Questions:

What physical and behavioral adaptations help walrus survive life in the Arctic?

How does seasonal sea ice extent impact walrus behavior?

Why is sea ice especially important for female walrus and their calves?

Activity:

Behavioral And Physical Adaptations (30 minutes)

Overview: The background section familiarizes students with basic facts about Pacific walrus and sea ice that will be important throughout the VFT. The first activity *Behavioral and Physical Adaptations* focuses on reinforcing understanding of how walrus survive in their environment, and why sea ice provides an important part of their habitat. Supplementary information about sea ice is included in this section to promote student understanding of how sea ice forms in the arctic and how it impacts the arctic ecosystem.



AK Science Content Standards Addressed:6th Grade: SA1.1, SC2.27th Grade: SA1.18th Grade: SA1.1, SC2.2**Day Three:**

VFT section to complete: Questions (15 minutes)

Focus Questions:*What types of strategies can scientists use to monitor walrus in remote areas?**What factors must scientists consider when designing a research plan?***Activities:**

Adding to Your Research Map (15 minutes)

Designing a Research Plan (30 minutes)

Overview: In this section of *Watching Walrus* Dr. Lori Polasek describes the specific questions and hypotheses she hopes to answer with her walrus monitoring project. To answer these questions her team must develop a reliable way to monitor walrus in the wild without disturbing them. The focus of this VFT is the process of developing such a system. In the first activity your class will continue to familiarize themselves with walrus habitat as they add information about walrus range and sea ice extent to the *Research Map* you started in the Introduction Section. In their second activity students will begin to Design a Research Plan using specifications set out by the researchers. Students will have the opportunity to brainstorm their own observation method, compare their ideas with classmates and complete a writing activity defending their chosen method. In the next section of *Watching Walrus* students will have the opportunity to compare their monitoring system with the system researchers' chose.

AK Science Content Standards Addressed:6th Grade: SA1.1, SE2.17th Grade: SA1.1, SE2.18th Grade: SA1.1, SE2.1**Day Four:**

VFT section to complete: The Plan (30 minutes)

Focus Questions:

What qualities do scientists look for when selecting a research site?

What challenges must scientists anticipate when using technology in remote environments?

Activities:

Reflecting On Your Plan (15 minutes)

Adding To Your Research Map (15 minutes)

Overview: The Plan section of the VFT describes the process by which Dr. Lori Polasek and her team elected to use remote still cameras to monitor walrus. It describes what specification their system needed to meet and why still cameras were selected over other monitoring methods. The first activity in this section gives students a chance to reflect on the plan they developed in their last activity section goes on to describe how the scientists setup their cameras and how they selected different sites. Research Coordinator Terril Efirm describes what challenges the team needed to consider when working in remote areas. In the second activity students will add 2011 walrus monitoring sites to the Research Map started earlier in the VFT.

AK Science Content Standards Addressed:

6th Grade: SA1.1, SE2.2

7th Grade: SA1.1, SE2.2

8th Grade: SA1.1, SE2.2

Days Five & Six:

VFT section to complete: Action! (45 minutes)

Focus Questions:

What is it like to be a research scientist in remote Alaska?

What considerations must scientists make when deciding how much data to collect?

Activities:

Imagining A Research Site (30 minutes)

Cameras In Action (15 minutes)

+ completing any unfinished activities from other sections

Overview: The Action section of Watching Walrus describes the adventure associated with setting up cameras at the remote monitoring sites in Bristol Bay. Students will use observations they make while



watching the first videos in this section to Imagine A Research Site and will complete an activity placing their own remote cameras at a site, defending why they selected each placement and what information they hope each camera will collect. In the later part of this section students learn about the timing systems for the haulout cameras and in the second activity your class uses information from Research Associate Jill Prewitt to calculate how many photographs the researchers may expect to have at the end of the 2011 summer season.

AK Science Content Standards Addressed:

6th Grade: SA1.1, SA1.2, SA3.1, SE2.1, SE2.2, SG2.1

7th Grade: SA1.1, SA1.2, SE2.1, SE2.2, SG2.1

8th Grade: SA1.1, SA12, SE2.1, SE2.2, SG2.1

Days Seven & Eight:

VFT sections to complete: Results & Updates (30 minutes)

Focus Questions:

Why is it important to accurately estimate the number of walrus present at a haulout site?

How can the research skills developed in the Watching Walrus project be applied to study issues in your local community?

Activities:

Conducting A Census (30 minutes)

Local Research Proposals (90+ minutes)

Overview: The Results and Updates section of the VFT highlight data collected during the 2011 and 2012 field seasons. These data include census data for different sites, examples of disturbance recorded and reflections on challenges encountered. Challenges faced in 2011 informed new strategies for 2012 including the purchase of new cameras. Both pages highlight how the project has progressed over the course of two years and what actions the researchers hope to take in the future. In the first student activity in this section of the curriculum supplement students get to practice *Conducting A Census*, choosing their own estimation technique to count estimate walrus presences at one haulout site. The final activity associated with this VFT asks students to select a locally relevant environmental issue and to use the same techniques practiced in Watching Walrus to develop a *Research Proposal* to study their chosen issue.

AK Science Content Standards Addressed:

6th Grade: SA1.1, SA1.2, SA3.1, SE2.1, SE2.2, SG2.1

7th Grade: SA1.1, SA1.2, SE2.1, SE2.2, SG2.1

8th Grade: SA1.1, SA1.2, SE2.1, SE2.2, SG2.1



Specials Notes to Teachers:Using Curriculum Supplements

We encourage teachers to read through all Curriculum Supplements before beginning Watching Walrus with your students. Some projects, like the Research Map, will be completed over the course of this exploration.

Videos and PDFs

Many sections of Watching Walrus include embedded videos and pdf documents. Teachers may elect to print class sets of pdfs or use them digitally. All PDFs are 1-2 pages long. Most videos are less than 3 minutes long (exact durations can be found in the description of each video). Video transcripts are available for each video and can be accessed by clicking the 'Video Transcript' button below each clip.

Vocabulary

Important vocabulary terms are included in the VOCABULARY box in the lower right-hand corner of each section. A complete glossary of terms is included as a .pdf in the FOR TEACHERS section.

Age appropriateness

This virtual field trip is designed to meet Alaska state and National science content for students in grades 5-8. We understand that students in grades 5-8 may display a variety of skill sets and reading levels, therefore this grade distinction is designed only as a guideline. The scientific process discussed in this virtual field trip is appropriate for and may be enjoyed by older students as well. Older students may progress through this virtual field trip at a faster rate than that outlined above.

