

# Dinosaur Hunt on the Alaskan Peninsula

Sept 1 – Sep 12, 2026

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## Expedition Details

### Overview

National Park Service (NPS) units in Alaska contain some of the most informative fossil-bearing rocks anywhere in North America. By virtue of their geography, these units fall within the dynamic subcontinental region denoted as “Beringia,” the hypothesized land bridge connection between Asia and North America during the Plio-Pleistocene. And while the concept of Beringia has been extended to the entire Cenozoic, improved understanding of the geologic history of the region as well as broadening the large-scale ecological processes that occurred, the concept of Beringia has now been extended back into the Cretaceous. Recent work is showing that in addition to issues of biodiversity in ancient Beringia, detailed studies have now shown heterogeneity to this ancient landscape and how that heterogeneity influenced habitat preferences within extinct fossil vertebrates.

Multi-disciplinary paleontological and sedimentological work within NPS units in Alaska has been crucial in broadening our understanding of Beringian ecology and its extension into deep time. Late Cretaceous rocks of Denali National Park and Preserve (DENA), Yukon-Charley Rivers National Preserve (YUCH), Wrangell-St. Elias National Park and Preserve (WRST), and the North Slope of Alaska provide the most significant opportunity to examine an ancient high-latitude terrestrial ecosystem in detail anywhere in the world. Additionally, paleontological work on similar aged rocks in southwestern Alaska in Aniakchak National Monument (ANIA) has shown that this ecosystem is recorded across the state. This ecosystem supported a rich dinosaurian fauna as well as other fossil vertebrates such as mammals, birds, and fishes.

The Chignik Formation is part of the Peninsular Terrane, the structural unit that encompasses much of southwestern Alaska. Paleomagnetic reconstruction based on the Upper Cretaceous and Lower Tertiary volcanic rocks of this terrane suggest that the Chignik Formation was deposited at approximately 55 degrees, near its current latitude. Based on the presence of the marine bivalves, *Inoceramus balticus* var. *kunimienis* and *I. schmidtii*, and the ammonite *Canadoceras newberryanum*, the age of the Chignik Formation is late Campanian to early Maastrichtian. The age of this sequence is close to the age of the dinosaur localities in DENA, YUCH and the North Slope of Alaska.

The Chignik Formation in ANIA is generally fluvial/estuarine and is now recognized to contain numerous dinosaur footprints, so many footprints that with proper documentation ANIA will become second in the Alaska Region only to DENA in terms of an abundant dinosaur record. The lower part of the section along the coast of ANIA is marine in nature. Fossil leaves are abundant in three horizons in the Chignik Formation at Aniakchak Bay (ANIA), and carbonized fossil wood is found throughout.

At least 12 distinct leaf forms were found in this section. Many of the angiosperm leaves show evidence of insect herbivory, an indication of environmental stress. The frequency of leaf damage by insects varies with time indicating that the environmental stresses also varied. These plants in Aniakchak Bay are found within or adjacent to the sandstone and siltstone that contains the hadrosaur tracks. The presence of leaves of cf. *Metasequoia* throughout the Chignik Formation suggests that, as in the Late Cretaceous throughout Alaska, this tree was an important species, or the only canopy species in the forest.

## Scientific Objectives and Project Goals

The primary objects of the expedition are to:

- Reconstruct local pedosedimentary environments, including intact forest floors, within the Chignik Formation.
- Correlate the distribution of fossil vertebrates and sedimentary environments. Dinosaurs were the largest animals to walk the earth, and their widespread occurrence in Alaska shows the Cretaceous Arctic world had significant biological productivity. Correlating the distribution of fossil vertebrates with sedimentary environments will provide a qualitative sense of the relationship between environmental variance and the vertebrate biota.

## Permits, Specimens, and Data

We have all the necessary permits from the National Park Service and the State of Alaska.

All physical field related records made during the project will be archived at the New Mexico Museum of Natural History & Science, which is an AAM accredited museum.

Digital data will be archived at the New Mexico Museum of Natural History & Science and will be made available to qualified researchers. Digital data obtained within Aniakchak National Monument and Preserve will be available per the guidelines of the NPS.

## Participant Training

Expedition participants will be trained in basic trace fossil identification in modern environments (on the beach) and in the rock record. They will be trained to identify bird and vertebrate tracks in modern and ancient environments, taught what measurements to take, and what notes and photos to record. They will also be trained in basic paleobotanical identifications and insect herbivory patterns when applicable. Participants will learn the basic properties of sedimentary rocks, be trained in measuring stratigraphic sections, and learn to interpret sedimentary environments in the rock record based on observations we will make along the modern beach, tidal flats and estuaries. They will learn how to record notes in a notebook, what photos to take to record their observations, and how to draft up a simple measured section to provide a visual representation of their rock observations.

The readings will be discussed during conversations during windows of inclement weather, or while we are in transit. The ramifications of the readings will be incorporated during the data collecting throughout the project.

We have experience from 2015 leading students of various ages in remote Alaska through the Keck Geology Consortium. One of us (McCarthy) has also assisted for the past 27 years with instruction of a senior university field geology course at remote field sites in Alaska where participants complete a series of increasingly complicated and independent geological mapping projects.

Participants will gain a foundation of geologic and paleontological knowledge along with specific topics suited to the field locations and tasks we will perform during the field research portion of the program.

By the end of the program, Sponsor/Participants will be able to use the following tools and techniques:

- Understanding the rules of the road: paleontological resource use permits and how these affect our field work.
- Reading topographic and geologic maps
- Fossil prospecting
- Basic fossil identification
- Basic fossil collection and documentation
- Taking field notes and journaling
- Measuring and interpreting stratigraphic sections
- Basic photogrammetry

We will use the *Endeavour's* shore boats to bring us to land for exploration. Participants will be expected to document each day's exploration in their field journal. Exact locations for exploration will be determined by our study of the field maps, prior surveys, observations, and weather conditions.

Onboard lectures will include:

- Basic invertebrate paleontology and paleobotany
- Basic vertebrate paleontology
- Ichnology
- Principles of sedimentology and stratigraphy
- Museum studies and practices
- Science communication

Note that onboard learning sessions will typically take place in the evenings on days when we have field work but may take place during the day if we are underway to a new location. These conversations are expected to last 60-90 minutes in duration.

Participants will participate in discussions, reflecting on the day's work and relating required readings to our findings. Sessions will occur while on shore as part of the examination of outcrops, or during transits on the ship between stops. The discussions will allow Participants to present their findings and allow the team to collectively discuss how our explorations can be applied to future work. Additional readings and resources will be available on the vessel.

## **Itinerary**

We will be starting and finishing from Kodiak, Alaska. Kodiak History Museum, Alutiiq Museum, and Kodiak Maritime Museum are examples of museums in Kodiak that will be available for cultural enrichment.

Depending on results, Sponsor/Participants will be encouraged to participate in the analysis of data, as well as participate in conference presentations.

The selected sites are very remote, so a fair amount of self-reliance is needed. Bears are commonly seen, but interactions are rare. Much of our time will be on boats and while on shore we will be moving as a group. Group sizes of three or more have been shown statistically to reduce chances of bear encounters.

### **QUESTIONS**

There is no such thing as a foolish question. If you don't understand, PLEASE ask for clarification. Chances are someone else isn't understanding either! Discussion between participants is a critical part of the learning process.

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