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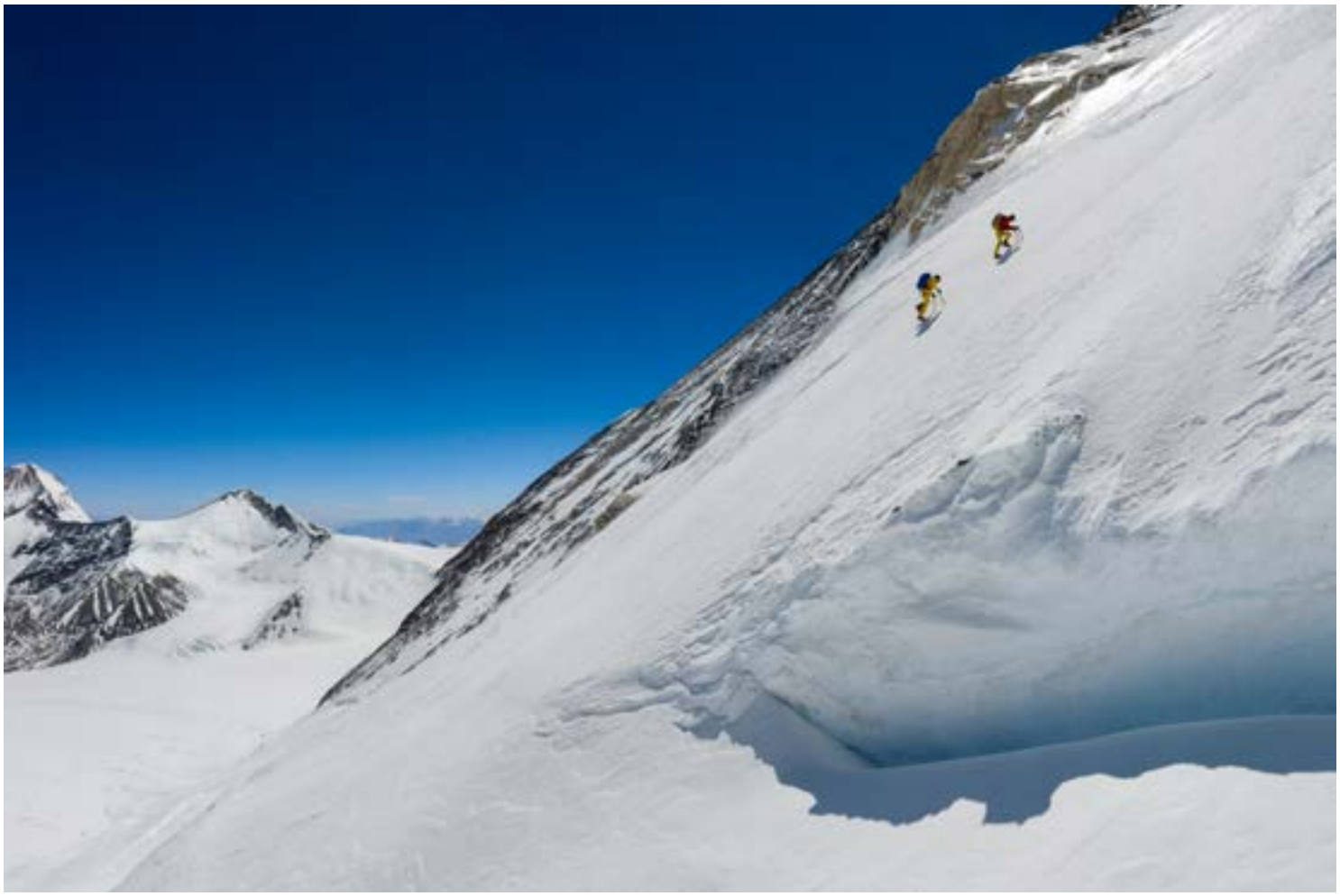
Student Speaker Series



FEATURING

Keith Ladzinski

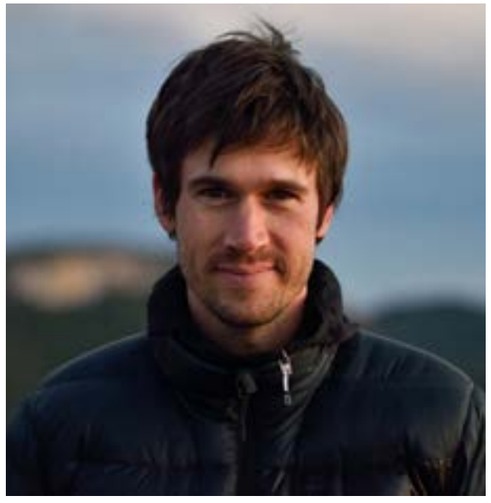
VITAL IMPACTS

Contents

All website references in this document are consolidated at
https://bit.ly/keithladzinskimedia

Keith Ladzinski

Over the past two decades, Keith Ladzinski has traveled widely throughout the seven continents to many of the planet's most remote and formidable locations documenting high altitude climbing expeditions, exploration, wildlife, scientific discovery, climate change and severe weather events. His passion for storytelling has earned him 12 National Geographic Assignments, three cover stories, and an Emmy nomination.



Notable and award winning stories include documenting the Great Lakes of North America, sauropod dinosaur discoveries in the African Sahara, storm chasing in Tornado Alley, the overharvesting of krill in Antarctica, and a wide range of climbing stories from Greenland, Mt. Everest, and Antarctica.

Whether battling katabatic winds, dangling from ropes above 8,000 feet to document the first ascent of Antarctica's tallest peak, trekking up Mount Everest, scaling ancient giant Redwoods, or navigating saltwater crocodiles in the floodplains of the Okavango, Keith goes to the extreme to capture the moment and share it with us. Celebrated as one of the most nimble nature, art, and commercial storytellers working today, Keith brings unparalleled nuance, sensitivity, and depth to his storytelling. Journey to the farthest reaches of our planet in this sweeping look at nature and man.

Visit Keith's website to learn more about him and see some of his amazing photographs.

Learn even more about Keith at Changemaker Talent.

Links to all background materials can be found on the reference page at https://bit.ly/keithladzinskimedia

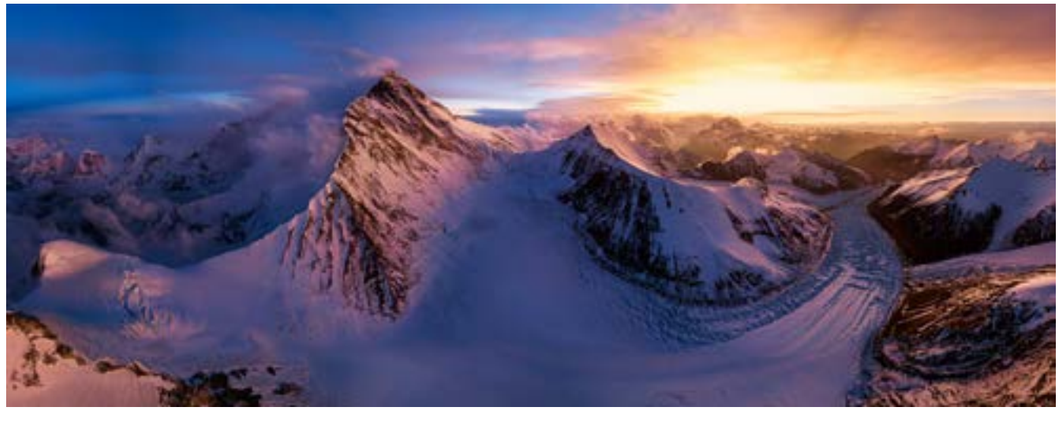
Relevant Concepts and Standards

Science concepts related to Keith's content area include:

- Biodiversity, ecosystems, climate change, natural resources, water quality, watershed, food webs, aquatic habitats, invasive species, algal blooms, human environmental impact

Educational standards that may be supported by Keith's content include:

- 5-LS2-1 - Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.
- 5-ESS2-2 - Describe and graph the amounts and percentages of water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth.
- 5-ESS3-1 - Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.
- MS-LS2-1 - Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.
- MS-LS2-4 - Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.
- MS-ESS3-2 - Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.
- MS-ESS3-3 - Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment
- MS-ESS3-4 - Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.
- MS-ESS3-5 - Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century.



Background Information

Articles

What's the Oldest Tree on Earth - and Will it Survive Climate Change?

Some bristlecone pines have been alive for nearly 5,000 years, setting the record for the oldest trees on Earth. New research, however, makes the claim that a large Patagonian cypress in Chile is actually the oldest.

Welch, Craig. "What's the Oldest Tree on Earth - and Will it Survive Climate Change?" *National Geographic Magazine*, National Geographic Society, 31 May 2022, https://www.nationalgeographic.com/environment/article/whats-the-oldest-tree-on-earth-and-will-it-survive-climate-change. Accessed 13 Dec. 2023.

North America's Most Valuable Resource is at Risk

The Great Lakes are incredible ecosystems and a key resource, the shores of which many people call home. Unfortunately, they are being challenged by climate change, pollution, and invasive species. Dive deeper into this landscape and learn more about some of the challenges these complex ecosystems are facing. Note: This article requires a National Geographic subscription which may be accessible via certain schools and organizations.

Folger, Tim. "North America's Most Valuable Resource is at Risk." *National Geographic Magazine*, National Geographic Society, 17 Nov. 2020, https://www.nationalgeographic.com/magazine/article/north-americas-most-valuable-resource-is-at-risk-feature. Accessed 13 Dec. 2023.

How the Parks of Tomorrow Will Be Different

America's national parks are uniquely special places that highlight some of our most majestic natural wonders. But what does park management look like in the face of climate change, and how do we adapt in order to preserve these well-known icons? Note: This article requires a National Geographic subscription which may be accessible via certain schools and organizations.

Nijhuis, Michelle. "How the Parks of Tomorrow Will Be Different." *National Geographic Magazine*, National Geographic Society, Dec. 2016, https://www.nationalgeographic.com/magazine/article/national-parks-climate-change-rising-sea-weather. Accessed 13 Dec. 2023.

When Deadly Storms Arrive, Here's Why We Run Toward Danger

Keith showcases some awe-inspiring photos and shares his insights on why some adrenaline-seeking people are drawn to storm chasing. Note: This article requires a National Geographic subscription which may be accessible via certain schools and organizations.

Ladzinski, Keith. "When Deadly Storms Arrive, Here's Why We Run Toward Danger." *National Geographic Magazine*, National Geographic Society, 14 Jan. 2020, https://www.nationalgeographic.com/magazine/article/when-deadly-storms-arrive-heres-why-we-run-toward-danger. Accessed 13 Dec. 2023.

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Background Information

Film and Video

My Life as an Adventure Filmmaker and Photographer

Follow Keith's photography journey, from getting his first camera to capture moments skateboarding with his brother, to finding his way as a rock climbing photographer by taking risks and saying yes to any opportunity, to working with National Geographic.

Run time: 80 minutes split over three videos

https://www.youtube.com/watch?v=5j5TdORzgh0, https://www.youtube.com/watch?v=NtI7MsPIf-Y, and https://www.youtube.com/watch?v=p9boacxCgiE

"My Life As an Adventure Filmmaker and Photographer (Part 1) | Nat Geo Live." *YouTube*, uploaded by National Geographic, 13 May 2017, https://www.youtube.com/watch?v=5j5TdORzgh0. Accessed 13 Dec. 2023.

"My Life As an Adventure Filmmaker and Photographer (Part 2) | Nat Geo Live." *YouTube*, uploaded by National Geographic, 20 May 2017, https://www.youtube.com/watch?v=NtI7MsPIf-Y. Accessed 13 Dec. 2023.

"My Life As an Adventure Filmmaker and Photographer (Part 3) | Nat Geo Live." *YouTube*, uploaded by National Geographic, 27 May 2017, https://www.youtube.com/watch?v=p9boacxCgiE. Accessed 13 Dec. 2023.

Everglades in Peril / Alligator Dive

Join Keith for a short behind the scenes video as he attempts to take the perfect underwater photo of an alligator in Everglades National Park.

Run time: ~2 minutes

"Everglades In Peril / Alligator Dive BTS." Vimeo, uploaded by 3 Strings, 30 Aug. 2016, https://vimeo.com/180772338. Accessed 13 Dec. 2023.

The Karsts of China

Documenting rock climbing and adventure stories is what really put Keith's photography and filmmaking on the map. Follow him on a journey to China where a group of climbers explores some incredible limestone karst formations.

Run time: ~4 minutes

"The Karsts of China: A Vertical Journey." *Vimeo*, uploaded by 3 Strings, 3 Jun. 2014, https://vimeo.com/97264893. Accessed 13 Dec. 2023.

Untamed Antarctica

Keith joins a small team of adventurous rock climbers on a National Geographic trip, venturing deep into Antarctica in order to be the first people to climb the unclaimed peaks of Antarctica. Follow the team as they navigate the crushing cold and brutal winds for a truly unique adventure.

Run time: ~3 minutes

"Untamed Antarctica." *Vimeo*, uploaded by 3 Strings, 1 Sept. 2013, https://vimeo.com/73562547. Accessed 13 Dec. 2023.

The Power of Versatility

Take a deep dive into photography techniques and tips. In this fascinating technical talk, captivating for both photography pros and amateurs, Keith highlights the gear and methods he uses to get the perfect shot.

Run time: 54 minutes

"Keith Ladzinski: The Power of Versatility | #BHOPTIC." *YouTube*, uploaded by B&H Photo Video Pro Audio, 8 Aug. 2022, https://www.youtube.com/watch?v=MiOwTQGfkSY. Accessed 13 Dec. 2023.

Links to all films and videos can be found on the reference page at https://bit.ly/keithladzinskimedia.
We recommend opening these links to follow along.

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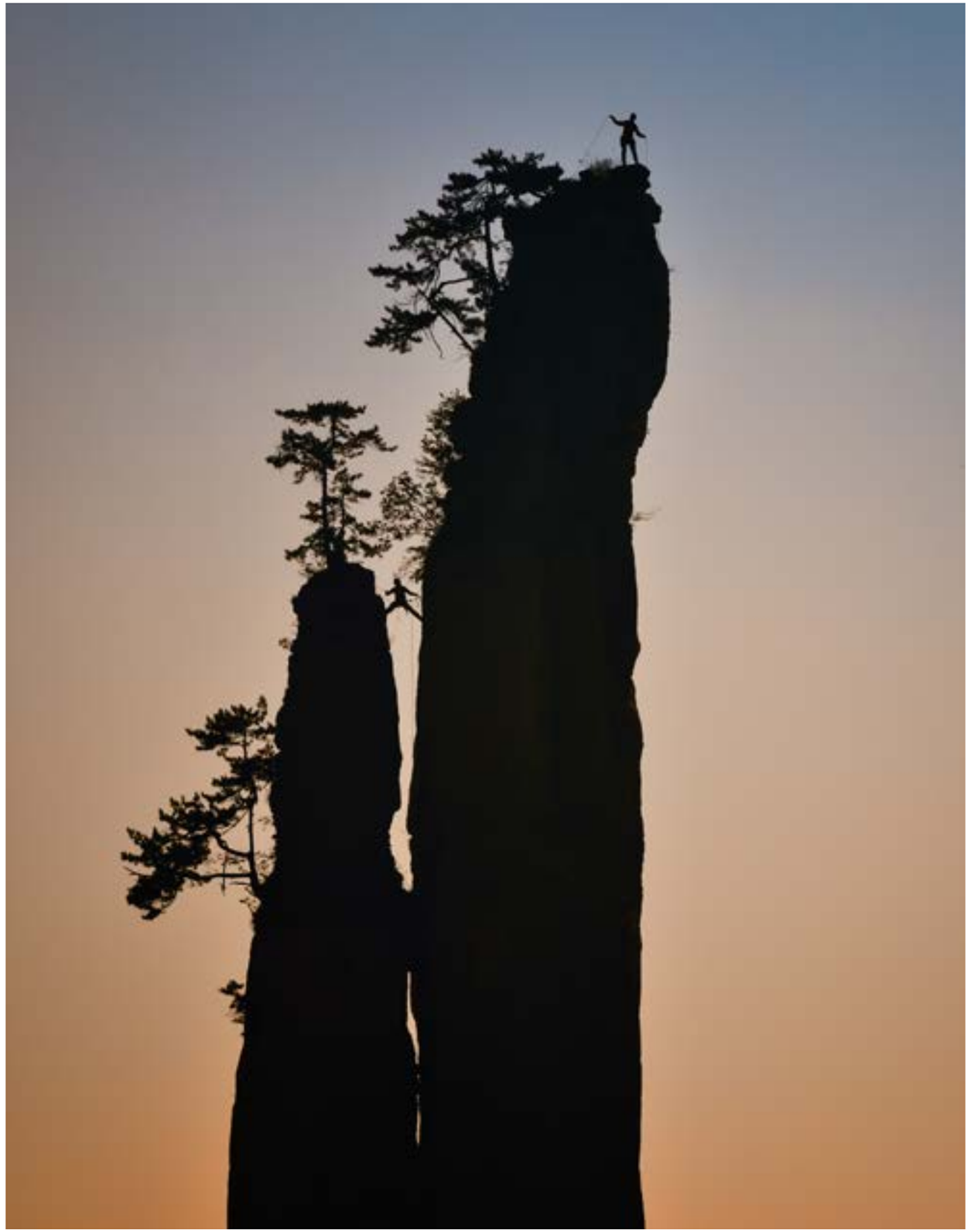

Background Information

Websites

The Disrupted Food Web of the Great Lakes

Explore this infographic illustrating the complex food web within the Great Lakes and how that has been affected by a variety of invasive species.

"See how the Great Lakes food web is in trouble." *National Geographic Magazine*, National Geographic Society, 17 Nov. 2020, https://www.nationalgeographic.com/magazine/graphics/see-how-the-great-lakes-food-web-is-in-trouble?loggedin=true&rnd=1701184984557. Accessed 13 Dec. 2023.

US Climate Resilience Toolkit - Great Lakes

Learn more about the ways in which climate change is affecting the Great Lakes region.

"Great Lakes | U.S. Climate Resilience Toolkit." *U.S. Climate Resilience Toolkit,* 9 Nov. 2022, https://toolkit.climate.gov/regions/great-lakes. Accessed 13 Dec. 2023.

CLEAN Resources

Visit CLEAN, the Climate Literacy and Energy Awareness Network, for a vast collection of vetted teaching resources on climate and energy for K-12 and beyond.

"CLEAN: Committed to Climate and Energy Education." *CLEAN*, 27 Nov. 2023, https://cleanet.org/index.html. Accessed 13 Dec. 2023.

National Geographic: Invasive Species

Use this collection of resources by National Geographic to learn more about invasive species.

"Invasive Species." *National Geographic*, https://education.nationalgeographic.org/resource/resource-library-invasive-species/. Accessed 13 Dec. 2023.

Introduction to Rock Climbing

For anyone inspired by Keith's climbing adventures, check out The Craig for more information on rock climbing.

"Introduction to Rock Climbing | TheCrag." *The Crag*, 2020, https://www.thecrag.com/en/article/beginners. Accessed 13 Dec. 2023.

Exploring by the Seat of Your Pants

Bringing those on the frontlines of science, exploration, conservation, and adventure live into classrooms through virtual guest speakers and field trips.

"**Home - Exploring by the Seat of Your Pants.**" Exploring by the Seat of Your Pants, 2023, https://www.exploringbytheseat.com. Accessed 25 Oct. 2023.

Links to all websites can be found on the reference page at https://bit.ly/keithladzinskimedia

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View recordings of their Global Biodiversity Festival presentations.

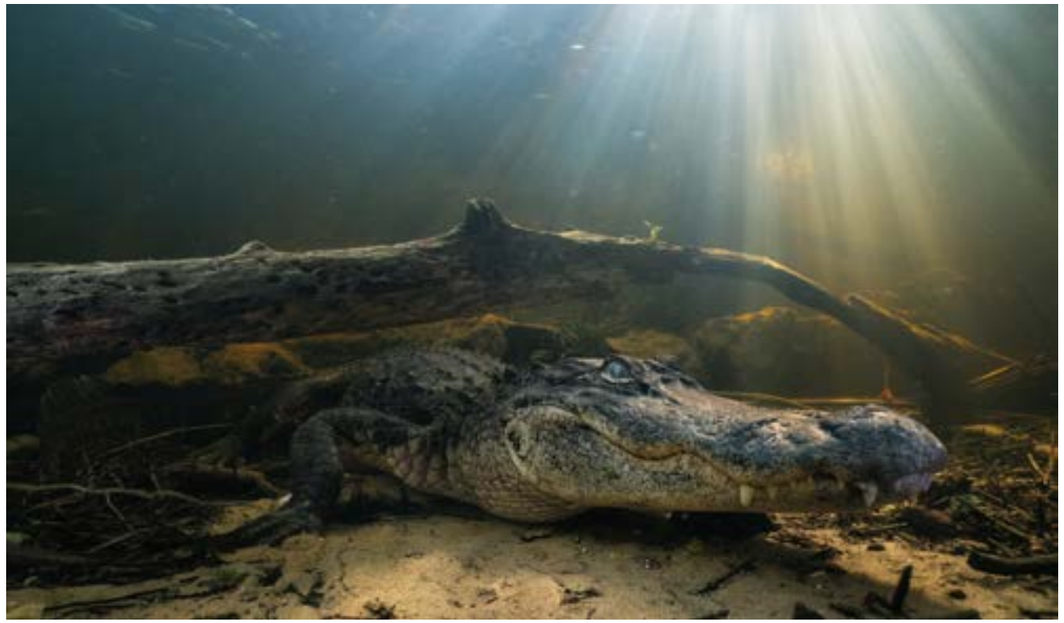
- **Global Biodiversity Festival Year 4,** Exploring by the Seat of Your Pants, 30 Aug. 2023, https://www.youtube.com/playlist?list=PLwKFsJZmdxpFfbyVWQ0_gCyWoXhGAqY3a.
- **Global Biodiversity Festival Year 3,** Exploring by the Seat of Your Pants, 24 July. 2022, https://www.youtube.com/playlist?list=PLwKFsJZmdxpGryUYol9hbrpGZZmBhbO3G.
- **Global Biodiversity Festival Year 2,** Exploring by the Seat of Your Pants, 20 July. 2023, https://www.youtube.com/playlist?list=PLwKFsJZmdxpEhK9d-PHhHQqQgdM-2Xay0.
- **Global Biodiversity Festival Year 1,** Exploring by the Seat of Your Pants, 24 July. 2022, https://www.youtube.com/playlist?list=PLwKFsJZmdxpGLflfxa9I5lXsmBoDeRMD0.

Videos relevant to Keith's work include: Save The Lakes! The Manitoba Museum, Chasing Extreme Weather With George Kourounis, and Climate Clues.

"Save The Lakes! The Manitoba Museum." *YouTube*, uploaded by Exploring by the Seat of Your Pants, 22 Sept. 2021, https://www.youtube.com/watch?v=QARKK39iYg0. Accessed 13 Dec. 2023.

"Chasing Extreme Weather With George Kourounis." *YouTube*, uploaded by Exploring by the Seat of Your Pants, 7 Mar. 2023, https://www.youtube.com/watch?v=DAqfrov43M0. Accessed 13 Dec. 2023.

"Climate Clues." *YouTube*, uploaded by Exploring by the Seat of Your Pants, 7 Mar. 2023, https://www.youtube.com/watch?v=FUPj0jyDHJI. Accessed 13 Dec. 2023.



Links to all websites can be found on the reference page at https://bit.ly/keithladzinskimedia

Activities

Check out these activities and lessons to support your students' learning.

Aquatic Invasive Species Education Project

Students will explore how various invasive species impact the Great Lakes in this collection of activities that include interactive simulations, role-playing stakeholder discussions, independent research, and STEAM problem-solving.

"Aquatic Invasive Species Education Project: Enrichment Activities." Michigan Department of Natural Resources, https://www.michigan.gov/-/media/Project/Websites/invasives/Documents/Outreach/AISEducationproject.pdf. Accessed 13 Dec. 2023.

Tree Rings

In this lesson from the National Park Service, students explore how climate and weather affects tree rings and how these growth rings are used to determine the age of a tree.

"Tree Rings - Teachers (U.S. National Park Service)." *National Park Service*, 21 May 2015, https://www.nps.gov/teachers/classrooms/trerin.htm. Accessed 13 Dec. 2023.

How does Climate Change Affect the Great Lakes?

In this lesson, students conduct a lab experiment to study algal blooms and eutrophication.

"How does Climate Change Affect the Great Lakes?" *Science Journal for Kids and Teens*, https://sciencejournalforkids.org/wp-content/uploads/2019/09/superior_lab_lesson.pdf. Accessed 13 Dec. 2023.

Great Lakes Climate Change Curriculum

This robust curriculum from the Ohio Sea Grant offers a collection of climate lessons connected to the unique Great Lakes ecosystem.

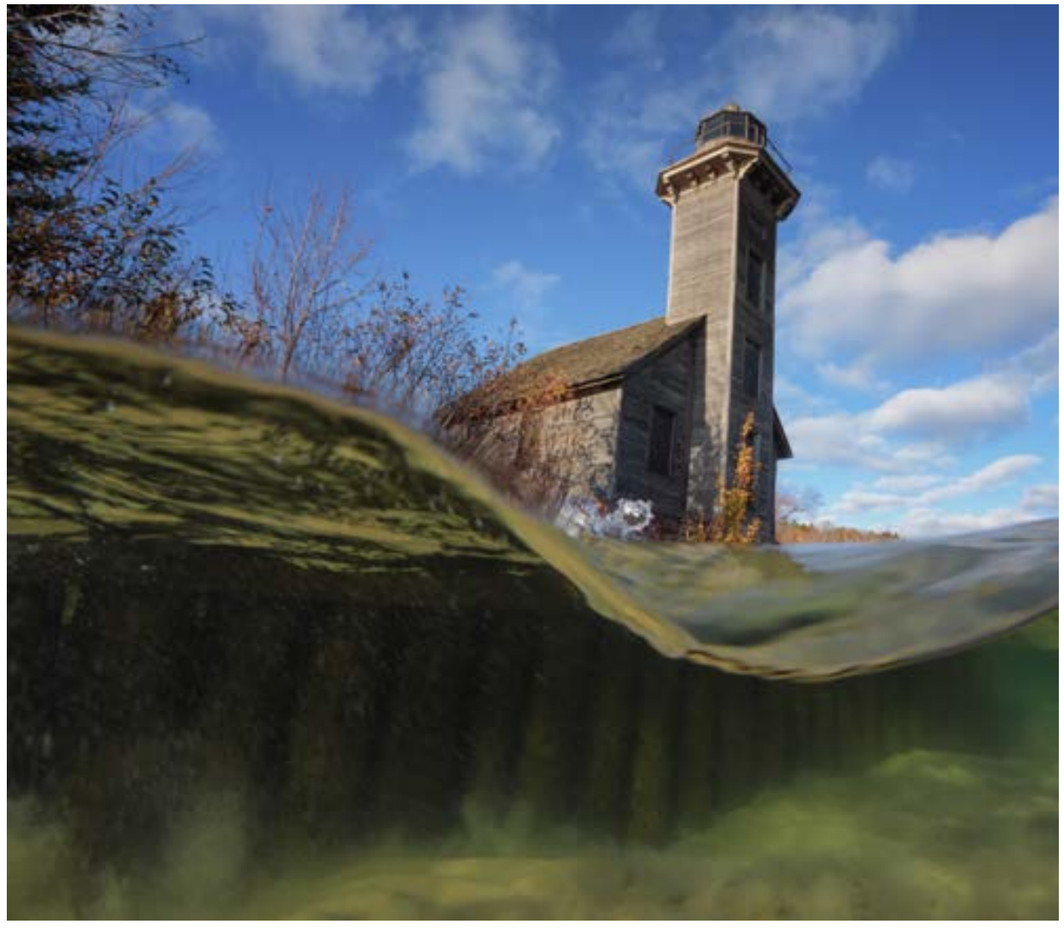
"Great Lakes Climate Change Curriculum." *Ohio Sea Grant*, 9 May 2019, https://ohioseagrant.osu.edu/products/nykht/gl-climate-change-curriculum. Accessed 13 Dec. 2023.

All activity links can be found on the reference page at https://bit.ly/keithladzinskimedia

Harmful Algal Blooms

In this multi-part lesson, students are introduced to Harmful Algal Blooms, the ways that they impact food webs and humans, and their connections to climate change.

"Harmful Algal Blooms - Climate Science for the Classroom." *University of Washington*, 2019, https://uw.pressbooks.pub/climate/chapter/harmful-algal-blooms/. Accessed 13 Dec. 2023.

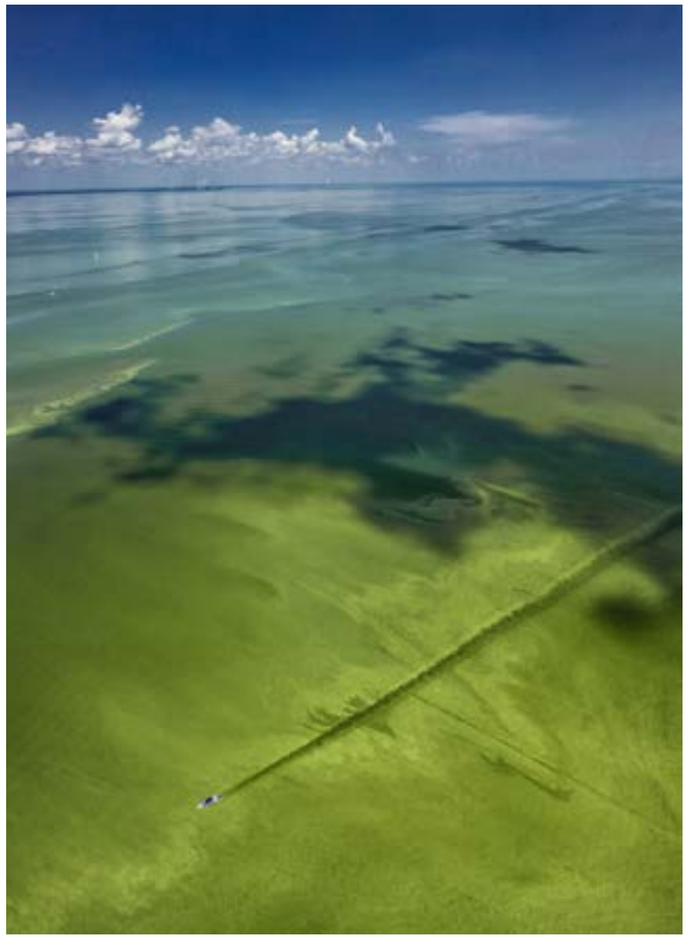


All activity links can be found on the reference page at https://bit.ly/keithladzinskimedia

Activities

A Picture is Worth a Thousand Words: Interpreting Keith's Photos

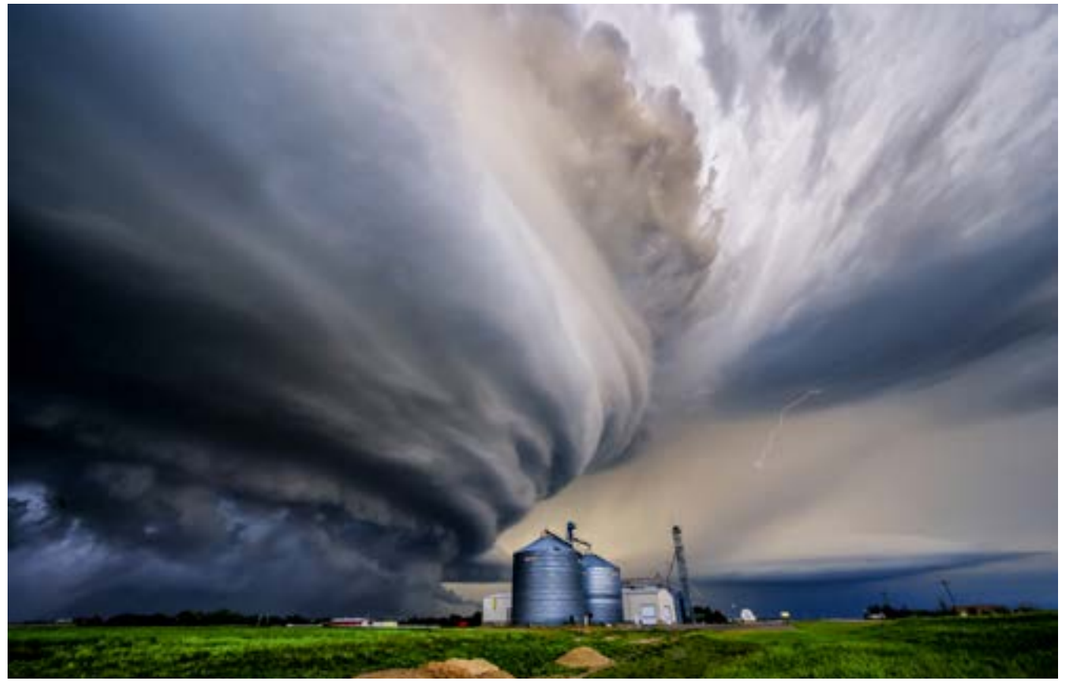
Show your students the following photographs of Keith's. Lead them through close looking and interpretation of the photos using the following questions.



- What do you notice in this photograph? Gather observations from students.
- What do you think is going on? Encourage students to make connections and educated guesses. What clues do you have that tell you about the scale of this photo? Where do you think this might be taken? What do you think this green is?
- What else do you wonder about what's going on in this image?
- *Reveal the context of the photograph: This is a drone photo taken of a research boat cutting through a large algal bloom in Lake Erie in 2019. Algae are microscopic unicellular organisms, and they can form blooms like this when high amounts of nutrients enter into waterways, often as runoff from fertilizer or other nutrient pollution. When the excess algae die, bacteria digest the dead plants, using up the dissolved oxygen in the lake and causing underwater "dead zones" without enough oxygen for fish and other aquatic plant life - a process called eutrophication. Some algal blooms are also classified as Harmful Algal Blooms (HABs) when certain species of algae produce toxins that, in these high concentrations, can be harmful to humans and wildlife.*

All activity links can be found on the reference page at https://bit.ly/keithladzinskimedia

Activities



- What do you notice in this photograph? Gather observations from students.
- What do you think is going on? Encourage students to make connections and educated guesses.
- What else do you wonder about what's going on in this image?
- *Reveal the context of the photograph: This is a photo of a huge storm cell in Imperial, Nebraska. This cylindrical rounded cloud edge is known as a "mother ship" formation. This area in the central United States is especially prone to storms and tornadoes; its location between the Rocky Mountains and Appalachian Mountains creates an ideal mixing bowl of warm moist air and cold dry air. Keith and the team of storm chasers he traveled with to get this shot had to follow weather forecasts and radar maps diligently in order to stay safe. This is definitely something best left to the experts! Consider the following discussion questions: How do you think storms like this impact the environment? The people who live here? What would you do in an emergency weather event like a tornado or hurricane? Do you have a plan in place?*

All activity links can be found on the reference page at https://bit.ly/keithladzinskimedia

Activities

- What do you notice in this photograph? Gather observations from students.
- What do you think is going on? Encourage students to make connections and educated guesses.
- What else do you wonder about what's going on in this image?
- *Reveal the context of the photograph: This woman is rock climbing on a karst formation in China. Karst caves, like this one made of limestone, are formed when water slowly erodes the soft limestone. Karst landscapes can include caves, underground streams, and steep stone cliffs. Also notice the stalactites - conical rock formations hanging down from ceilings and ledges, formed when mineral-rich water drips slowly, leaving the minerals to build up over time. These types of karst formations with their nooks and crannies make very unique environments for rock climbing. Notice the ropes and clips these climbers are using to keep themselves safe. Would you ever want to try rock climbing like this?*

All activity links can be found on the reference page at https://bit.ly/keithladzinskimedia

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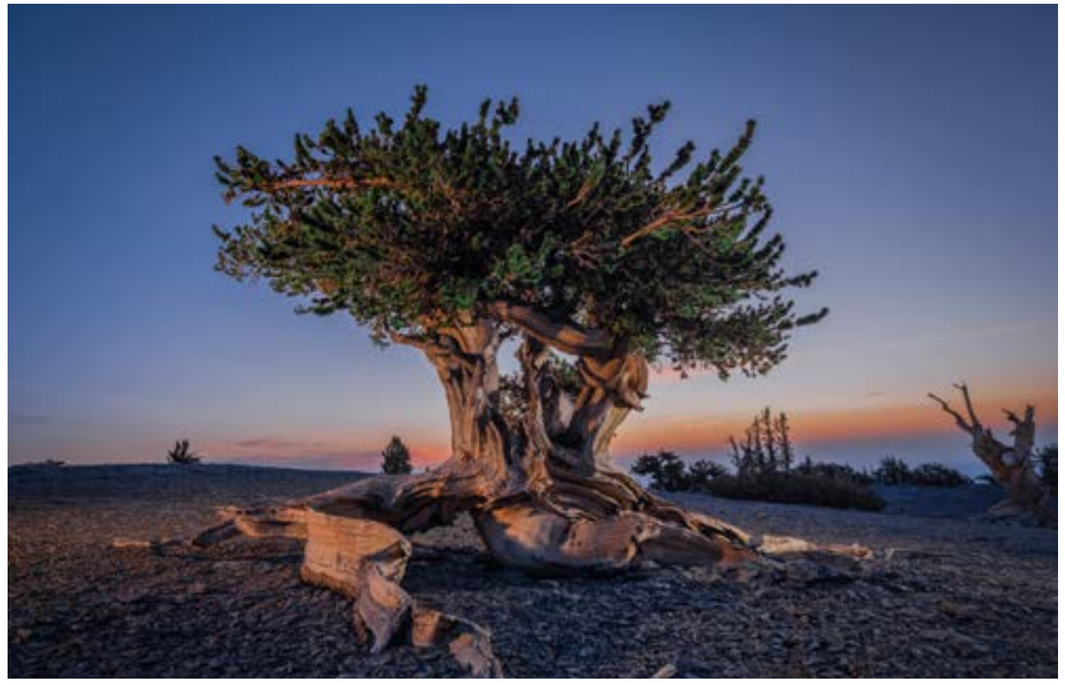
Activities



- What do you notice in this photograph? Gather observations from students.
- What do you think is going on? Encourage students to make connections and educated guesses. What words would you use to describe this tree? How would you describe the landscape?
- What else do you wonder about what's going on in this image?
- *Reveal the context of the photograph: This is a bristlecone pine located on Mount Washington, in Nevada's Great Basin National Park. The oldest documented tree on Earth is a bristlecone pine that is 4,853 years old - meaning it was around before the ancient Egyptians built the pyramids at Giza. Bristlecone pines can live an incredibly long time - the particular tree in this photo is an impressive 1,400 years old. One reason bristlecone pines can live such a long time in the Great Basin region specifically is that very few other things can live here. At high altitudes around 11,000 feet there are no grasses or bushes, no other trees to spread pathogens, no competition, few pests, and no people. Another strategy that bristlecone pines use is called "strip barking." Even though large sections of the tree may die, the remaining narrow bands of living tree can still keep the roots and branches connected. In some cases, 95% of the tree may be dead while the remaining 5% lives on.*

All activity links can be found on the reference page at https://bit.ly/keithladzinskimedia

Activities

- What do you notice in these photographs? Gather observations from students.
- What do you think is going on? Encourage students to make connections and educated guesses. What animal do you think this is? How do you think it might get its food?
- What else do you wonder about what's going on in these images?
- *Reveal the context of the photographs: These are sea lampreys. The first photo shows them swimming in a tank, while the second photo shows a close up of their toothy, suction cup mouths. Sea lampreys are a type of parasitic fish. Parasites are organisms that live on or inside another organism (the host) and get something they need from the host in a way that harms the host. In this case, sea lampreys use their suction cup mouths to latch on to fish, feeding on their blood and body fluids. Sea lampreys are also an invasive species in the Great Lakes, spreading throughout the Lakes from the Atlantic Ocean via artificial canals. Unfortunately, these invasives prey on important lake fish like trout, whitefish, perch, and sturgeon, and one lamprey can kill about 40 pounds of fish in a year. Field biologists are working on ways to reduce the sea lamprey population and restore balance to this aquatic food web. Sea lampreys might look frightening, but don't worry! They generally leave humans alone and bites on people are rare.*

All activity links can be found on the reference page at https://bit.ly/keithladzinskimedia

Activities

Relevant Articles to Read and Discuss - Science Journal for Kids (and Teens)

The Science Journal for Kids (and Teens) shares current peer-reviewed scientific research adapted for students and their teachers. They create articles written at various learning levels that include vocab lists, discussion questions, additional supporting material, and lesson plan ideas.

Articles relevant to Keith's work include:

How can we protect the seabed from storms?

How can we protect the seabed from storms?, which explores how Marine Protected Areas can support marine ecosystem recovery from extreme weather events, and What are the most dangerous places for sharks?

Elitsa. "How can we protect the seabed from storms?" *Science Journal for Kids and Teens,* Sept. 2022, https://www.sciencejournalforkids.org/articles/how-can-we-protect-the-seabed-from-storms/. Accessed 28 Nov. 2023.

Elitsa. "What are the most dangerous places for sharks?" *Science Journal for Kids and Teens*, Feb. 2021, https://www.sciencejournalforkids.org/articles/what-are-the-most-dangerous-places-for-sharks/. Accessed 28 Nov. 2023.

The link for this Read and Discuss article can be found at https://bit.ly/keithladzinskimedia

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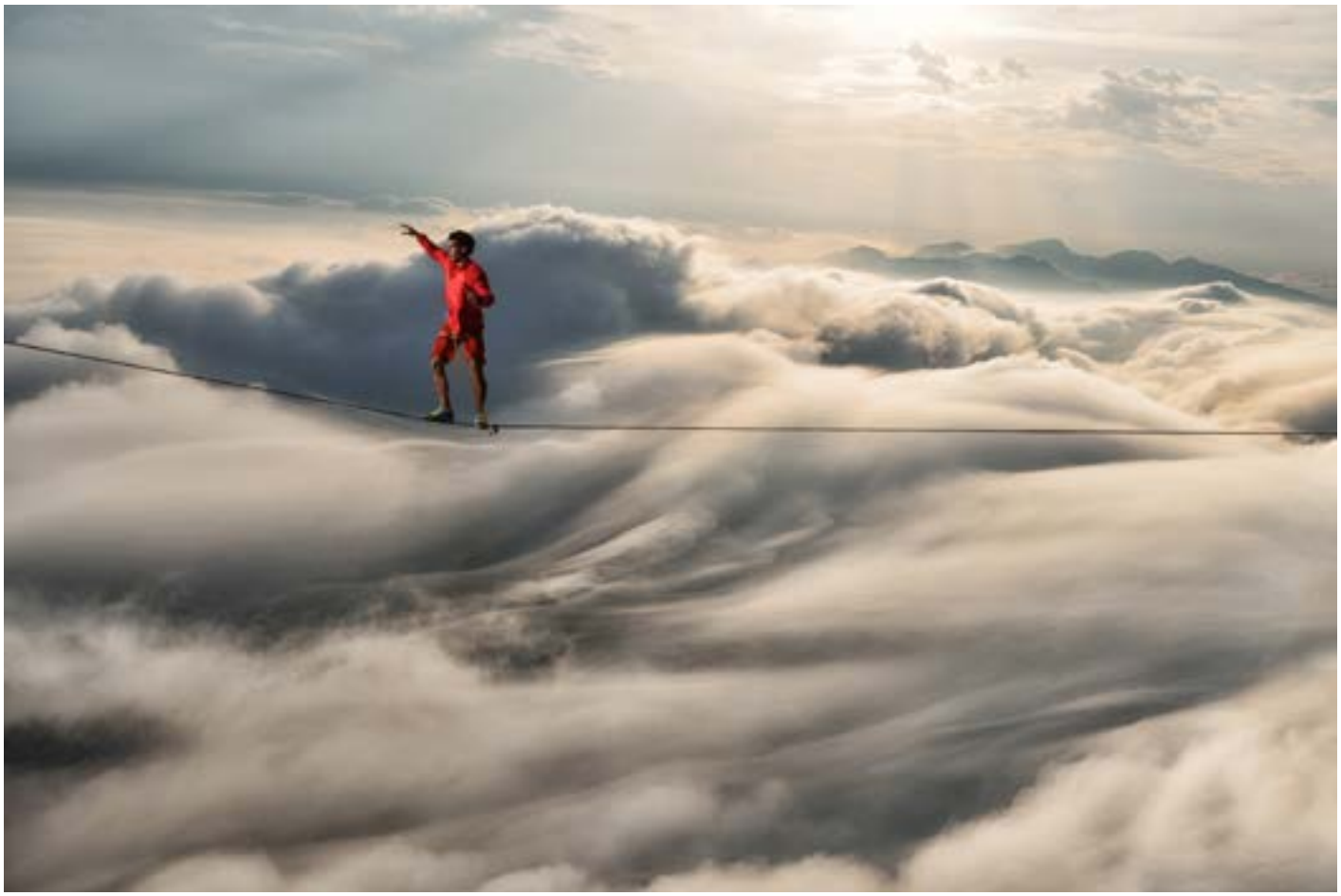

Stay in Touch!

We would love to hear from you. Visit us on our website at vitalimpacts.org, follow us on Instagram at @vital.impacts, and email us at hello@vitalimpacts.org with any questions or ideas!

Did you recently attend a Vital Impacts Student Speaker Series event? As educators, we value your input on our education programs. We'd love to know more! Will you fill out a brief (5-7 minute) survery at https://bit.ly/vitalsurvey ? As a thank you for your time, your verified survey will receive a $10 Starbucks Gift Card.

All photos by Keith Ladzinski