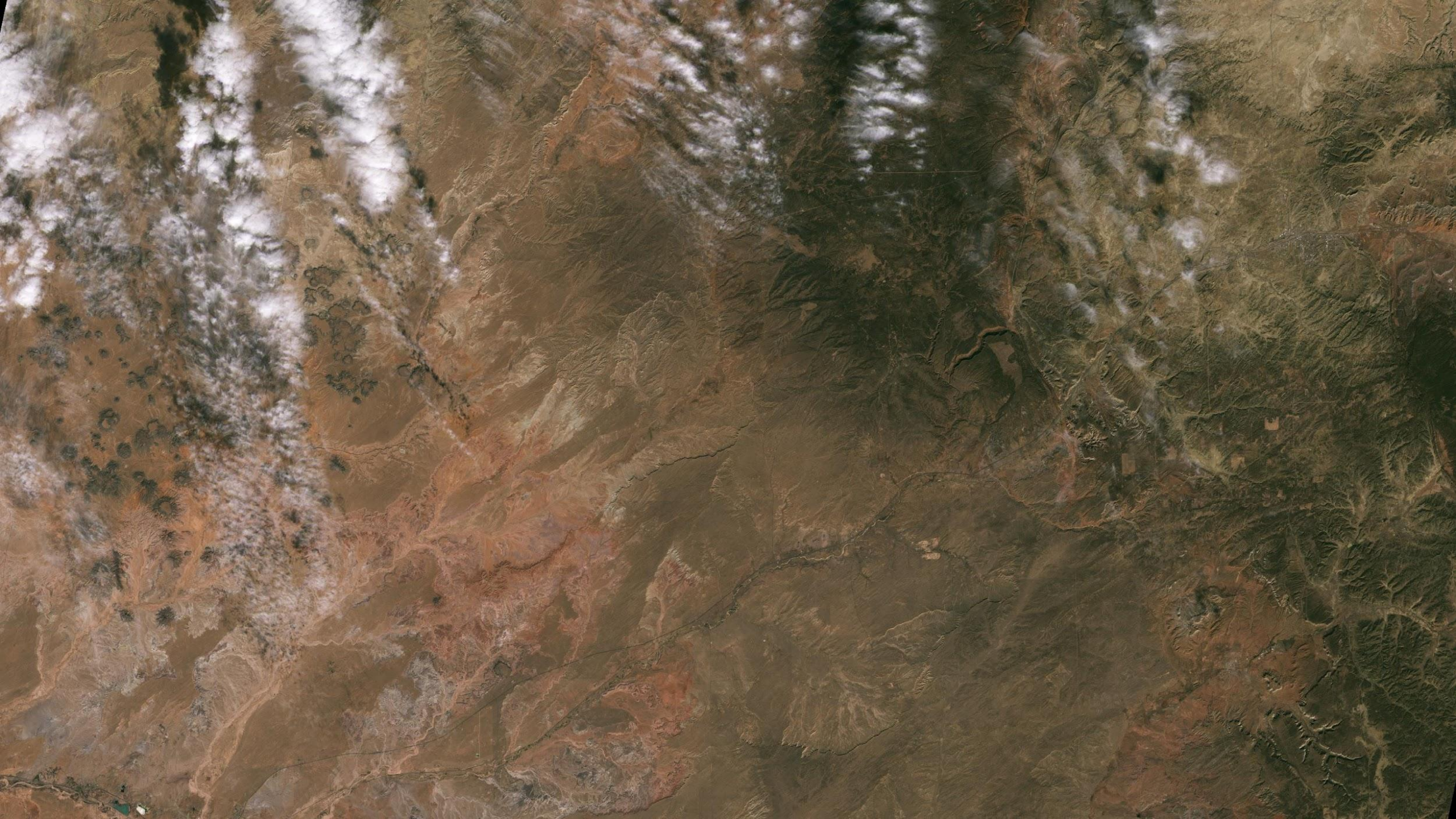


National Aeronautics and
Space Administration

NASA's Indigenous Peoples Initiative: Community Connections to Earth Observations

Amber Jean McCullum, PhD, BAERI/NASA
Ames Research Center
NASA WWAO Annual Meeting
May 1, 2024





Indigenous Peoples make up about 6% of the global population

Indigenous peoples protect 80% of the Earth's biodiversity – in the forests, deserts, grasslands, and marine environments in which they have lived for centuries.

There are 574 U.S. federally recognized Tribes – more state recognized, pueblos, rancherias, unrecognized Indigenous communities

Indigenous communities have experienced many environmental injustices, while simultaneously standing at the forefront of solutions.

The **knowledge of the land and people** stretch long past the data we have with satellite-based Earth Observations (EO). However, EO has a role to play in Indigenous community action.

Capacity Building Program Elements

ARSET

ARSET offers trainings (virtual and in-person) on a variety of satellite remote sensing topics to build skills for integrating EO into decision-making activities around the world.



DEVELOP

DEVELOP addresses the needs of decision-makers' through interdisciplinary 10-week feasibility studies that apply the lens of NASA EO to environmental issues around the globe.



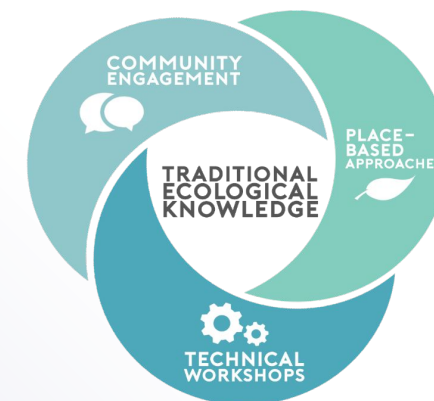
SERVIR

A partnership between NASA and USAID, SERVIR connects space to village by helping developing countries use satellite data to address critical challenges and develop innovative solutions to improve livelihoods and foster self-reliance.



Indigenous Peoples

Builds relationships across NASA and Indigenous communities through place-based remote sensing training, community engagement, and co-production of knowledge.



Indigenous Peoples Initiative (IPI)

- We engage and support Indigenous communities through listening sessions, meetings/conferences, and with regional organizations
- We co-develop place-based, in-person and online trainings focused on content relevant to Indigenous lands and territories
- We help build the capacity of Indigenous peoples to use NASA Earth Observations to monitor and manage their natural and cultural resources via place-based approaches



Amber Jean
McCullum, lead



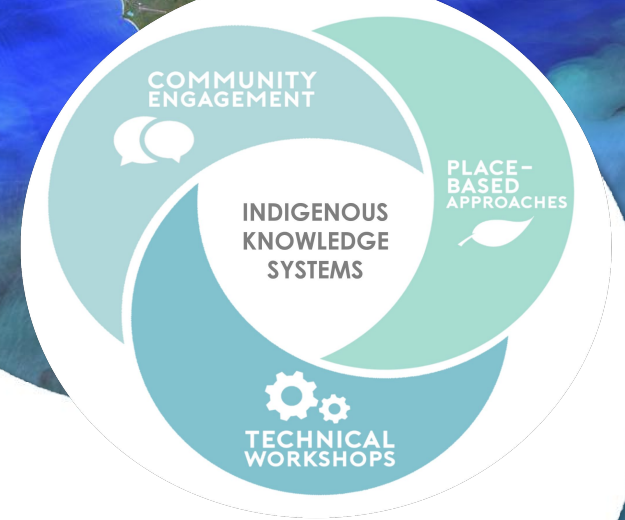
Nikki Tulley



Sativa Cruz

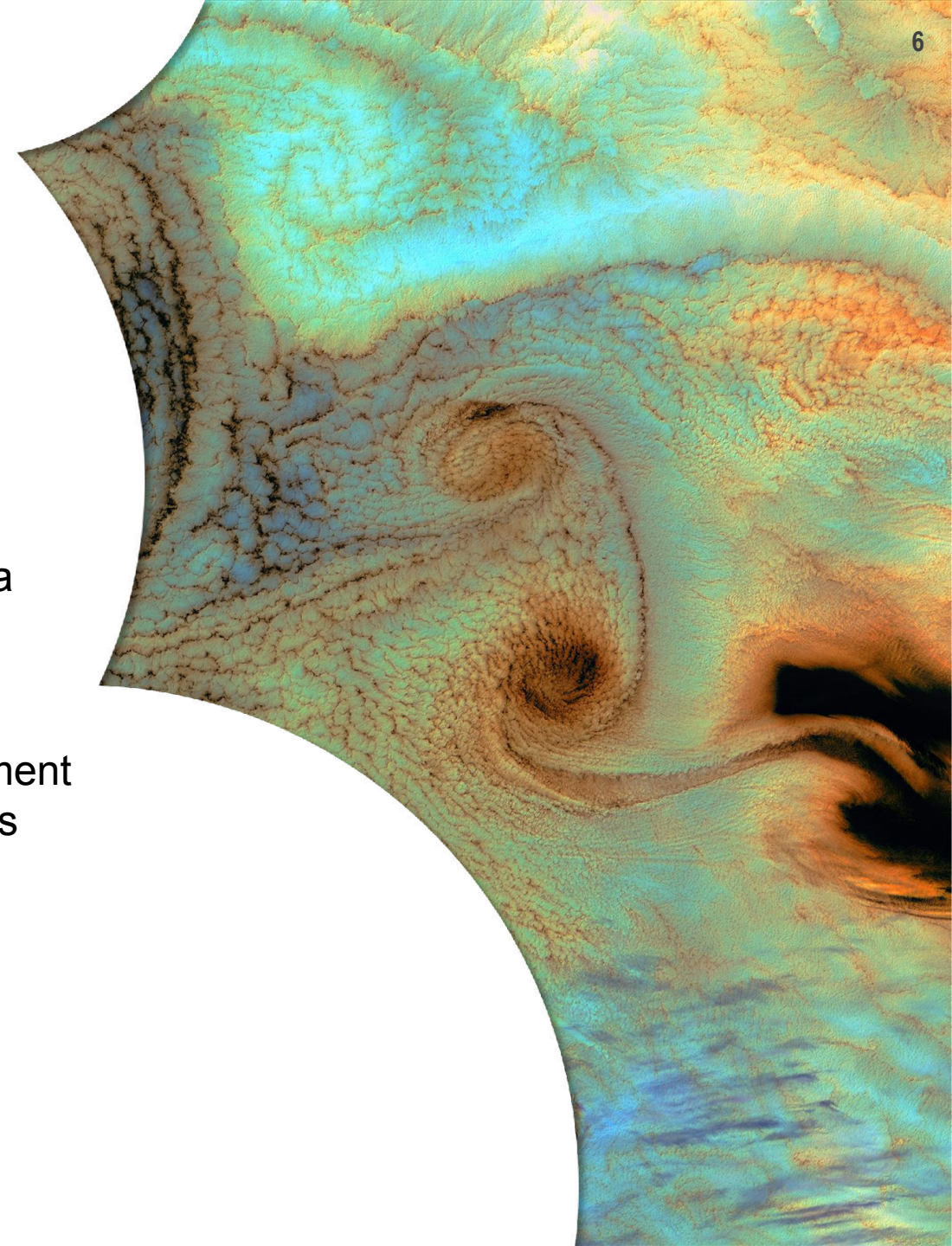


Victoria Ly



Strategic Goals

- 01** Cultivate knowledge sharing pathways around the use of Earth Observations (EO) for Indigenous communities
- 02** Strengthen the capacity for the use of NASA EO data and tools for Indigenous communities
- 03** Uphold and share respectful and reciprocal engagement strategies across NASA Earth Science for Indigenous communities
- 04** Increase presence of Indigenous people at NASA to diversify worldviews within Earth Science



IPI: Activities and Strengths



Engagement, Dialogue, and Community

Workshops/Conferences – Making connections and strengthening relationships at meetings

Cross-boundary connections – Federal and NGO (NOAA, USGS, Geo Indigenous Alliance), Private (Firelight Group, Winyama, ESRI Canada, Google)

Community involvement – Navajo Nation Art of Mother Earth Event

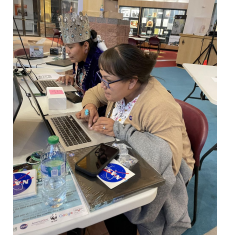
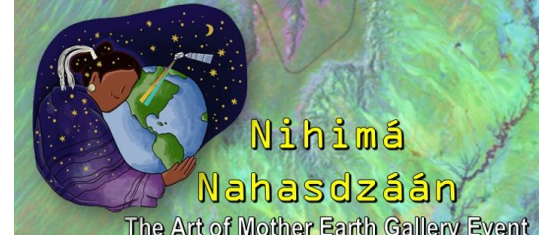
Future Regional Needs Assessments – Dialogue sessions on EO needs

Increased Capacity for Tribal Professionals to use NASA EO

Deep engagement – Multi-year relationships where we co-develop trainings with tribes (Karuk Tribe, Samish Indian Nation)

Tailored trainings – Hands-on trainings on wildfires, water resources, ecological conservation at workshops (Indigenous Mapping Workshop, Tribal GIS)

Researcher connections – Connecting Tribal employees with NASA researchers and programs

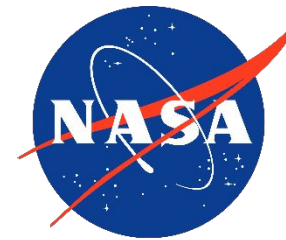


Indigenous Mapping Workshop (IMW) Australia

In-person Training Series, May 30–June 2 in Naarm (Melbourne)

IPI in collaboration with the Canadian Space Agency (CSA), Google, Geosciences Australia, and FrontierSI the IPI offered trainings sessions.

Training topics included an introduction to optical and radar data and applications of EO for droughts and floods on aboriginal lands. We also hosted a yarning session to share stories of Indigenous knowledge systems and connections to EO. Winyama, an Indigenous-led company, is hosting the event.



Karuk Department of Natural Resources Collaborative Training

In-person training, March 28-29 at KDNR in Orleans, CA.

- Collaborative Remote Sensing for Managing Natural Resources workshop
- Focused on Karuk's tribe's landscape monitoring and data needs, emphasis on wildfire monitoring





Navajo Nation Community Earth Observation Event

**In-person Community Event, April 4-5,
2023, Window Rock, AZ**

- Inaugural event co-developed, bring to the Navajo Nation an event introducing EO to families
- Following the community event there was time to meet with Navajo Nation Natural Resource employees for an EO roundtable discussion

Nihimá Nahasdzaán

What is your home sunshine story?

Did you know that the light tells stories? We've seen Mother Earth from our eyes on the ground, but how can we see her, as a whole, from above?

Satellite imagery can capture the point in time when the sky meets the Earth, allowing us to see the energy we are all apart of, revealing different layers of light. Use this app to change the layers of the satellite imagery to see what different combinations of layers reveal on the Earth's surface. Choose a year, month, location, and a different wavelength of light for red, green, and blue. Play with sliders to see how the imagery changes. What stories can the light tell?

Want to print your image? Click the button on the bottom right to export the display.

[START EXPLORING](#)

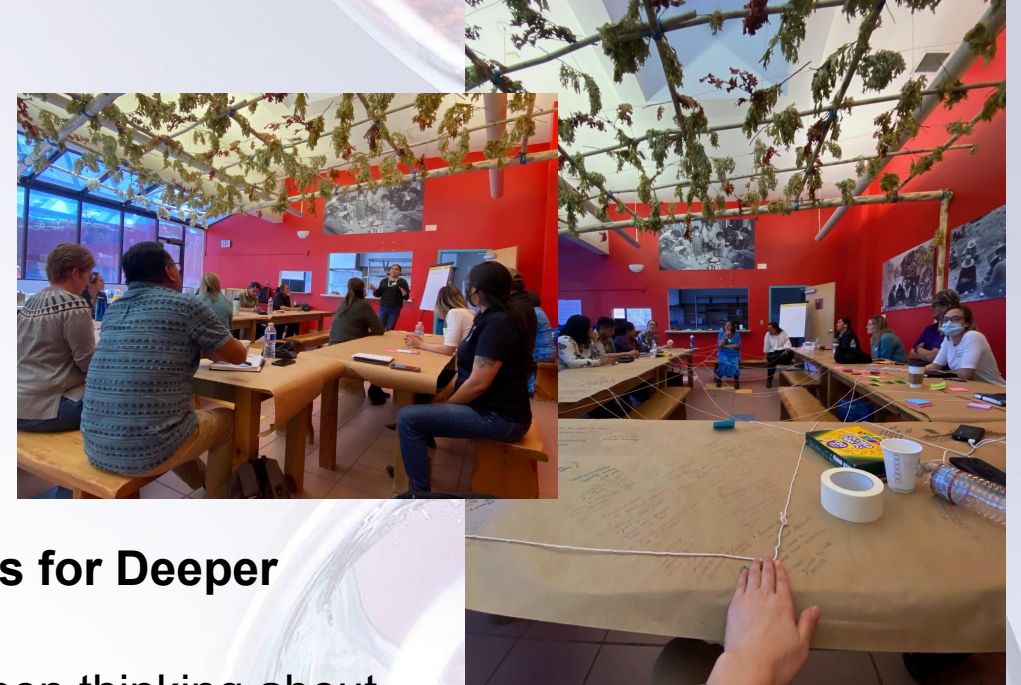
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Navajo Nation

Roundtable Needs Discussion

Round 1: Questions that Focus Collective Attention

- What are your thoughts / perceptions of EO? What are your community's thoughts or perceptions of EO?
 - What is one natural resource management issue where additional data or tools could improve upon the decision-making process?



Round 2: Questions that Connect Ideas for Deeper Insight

- What are the barriers/opportunities when thinking about EO in natural resource decision-making?



World Cafe ☺ ☒
Round 1:
↳ What are your thoughts or Perceptions of EO?
↳ What are your Community's thoughts or Perceptions of EO?

What does EO mean to you?

How can EO help with natural resource management?

The big "Why"

Round 3: Questions that Create Forward Momentum

- What would it take to create change for you to incorporate EO in natural resource decision making on this issue?
- What support is needed in taking the next steps?

Strategic Partnerships



Building Bridges across Earth Action and Beyond

The IPI team has engaged with, provided guidance, cultivated collaborative relationships, and supported projects with many NASA scientists and programs interested in engaging with Indigenous communities such as:

- Western Water Applications Office (WWAO)
- FireSense and Airborne sciences
- Mission Applications Teams – e.g. PACE, SBG, IceSat-2
- TOPS and Open Science Initiatives
- Office of STEM Engagement's MAIANSE Program
- NASA's Tribal Affairs Office and Consultation
- Native American ERGs – Natives and NASA, NAAC, Nebula, etc.



Connect. Cultivate. Sustain.



We are committed to the continued, increased, and sustained use of EO data within Indigenous communities to protect and restore the Earth's most vital lands.



Amber Jean
McCullum, lead



Nikki Tulley



Sativa Cruz



Victoria Ly

Thank you

Interested in engaging with Tribes and Indigenous Communities with your work? Want to learn more about NASA's Indigenous Peoples Initiative (IPI)?

Let's stay connected!

IPI Website:

<https://appliedsciences.nasa.gov/indigenous-peoples-initiative>

Email: AmberJean.Mccullum@nasa.gov



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