

2021 ANNUAL
REPORT

CONTENTS

EARTH SCIENCE INFORMATION PARTNERS (ESIP)	05
ESIP STRATEGY AND FOCUS	10
MEETINGS	12
COLLABORATIONS	16
PARTNERSHIPS	22
ESIP LAB	26
AWARDS	30
FINANCIAL UPDATE	32
ESIP LEADERSHIP	36
NOTE FROM THE EXECUTIVE DIRECTOR	40
JOIN US	41

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AND ALLISON MILLS

LANDSAT 9 RELEASED BRAND NEW IMAGES IN 2021,
INCLUDING THIS SCENE OVER THE HIMALAYAS.
CREDIT: LANDSAT 9 - USGS, NASA

“
Work as if you have
already succeeded.
Data needs to be a
first-class citizen, an
object of conversation.”

- PETER FOX, OPENING PLENARY AT THE LAUNCH OF THE RESEARCH DATA ALLIANCE IN 2013

A PILLAR OF THE GEOINFORMATICS COMMUNITY, PETER PASSED AWAY ON MARCH 27, 2021

FOUNDED THE ESIP SEMANTIC WEB CLUSTER, 2007
MARTHA MAIDEN LIFETIME ACHIEVEMENT AWARD, 2012
ESIP PRESIDENT 2014-2016

EARTH SCIENCE INFORMATION PARTNERS (ESIP)



CROWD2MAP IS A PARTNER ORGANIZATION OF ESIP AND SHARES INSPIRATION WITH FUTURE DATA SCIENTISTS AS PART OF THE ORGANIZATION'S CROWDSOURCED MAPPING IN RURAL TANZANIA. CREDIT: JANET CHAPMAN/CROWD2MAP TANZANIA (WINNER OF THE 2021 ESIP PHOTO CONTEST)

WHAT ESIP DOES

Our world is better with sound, accessible Earth science data.

ESIP helps members of the Earth Science data community find each other across organizations by fostering rich collaborative experiences like meetings and seed funding to further data interoperability.

ESIP holds twice annual meetings, monthly telecons, workshops, and provides ESIP Lab seed funding. ESIP brings together organizations as partners, and individual volunteers can participate regardless of whether or not they hail from an ESIP partner organization.



ESIP CELEBRATIONS

- EXPANDED ESIP STAFF IN CROSS-COLLABORATION AND COMMUNICATIONS EFFORTS
- WELCOMED SAIC AND MICROSOFT AS NEW SPONSORS ALONGSIDE ESRI'S SPONSORSHIP GROWTH
- LAID OUT COMMUNITY-ENDORSED [STRATEGIC THEMES 2021-2026](#)
- KICKSTARTED THE NOAA CLOUD PATHFINDERS PROGRAM
- ORGANIZED FOUR [DATA HELP DESK](#) EVENTS WITH SUPPORT FROM 100+ VOLUNTEERS
- SUPPORTED [EIGHT COMMUNITY FELLOWS](#)
- HOSTED MORE THAN 10 [ESIP WEBINARS](#) AND 150+ [COMMUNITY-LED TELECONS](#) THAT INCLUDED DOZENS OF GUEST SPEAKERS
- HOSTED TWO FULLY VIRTUAL, HIGHLY INTERACTIVE MEETINGS WITH >70 COMMUNITY-LED BREAKOUT SESSIONS WITH TALK DEVELOPMENT SUPPORT FOR SESSION LEADERS AND SPEAKERS
- THROUGHOUT THE REPORT, LOOK FOR STORIES TO SEE ESIP IN ACTION

“
In just an hour, over 100 relationships between research publications and the Earth science datasets that they use were uncovered and added to the Usage-Based Discovery tool.”

- SARA LAFIA, ESIP COMMUNITY FELLOW, UNIVERSITY OF MICHIGAN
Excerpt from her [Community Fellow blog post](#)

BETTER BIODATA

ESIP IN ACTION

Time may heal all, but it does a number on datasets. To ensure biological data is FAIR (findable, accessible, interoperable, and reusable), the Biological Data Standards Cluster designed a visual overview to [help data managers standardize their work](#).

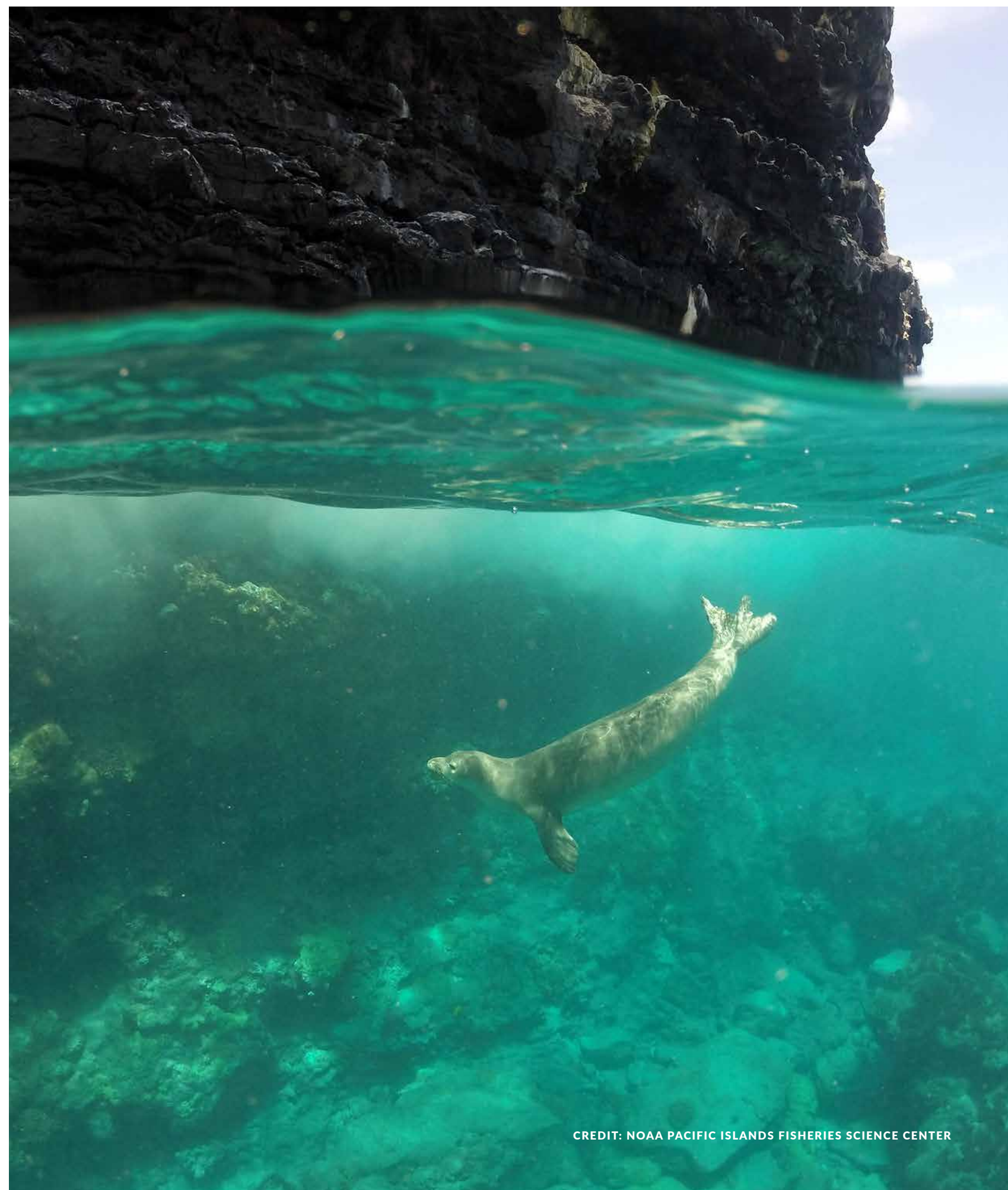
They call their work a primer and it is a step-by-step guide for data managers, especially those handling large biological datasets without a biology background and ecologists catching up on better data management techniques. The primer was imagined, created, and tested through ESIP's cluster format and formed through a NOAA-IOOS funded workshop facilitated by ESIP.

Standardizing data helps:

- improve management, analysis, and use of the biological observation data
- ensure metadata standards, data standards, taxonomic authorities, habitat classifications, web-enabled standards and services, as well as some best practices to help biological data to be understood, combined, and shared
- spread awareness about existing standards
- increase the adoption of existing biological standards and help make data more FAIR
- build a community of biological data managers

"Over the course of several months the cluster worked as a team to gather information together with the goal of enhancing widespread interest in standards," says Abby Benson, the cluster chair and a biologist with the United States Geological Survey (USGS). "We know there is an urgent need to understand status and trends in biodiversity at national and global scales but accessing and integrating the data is time consuming or impossible. With the work from this cluster, we hope to bridge the gap to make biological data more accessible and reusable."

The Biological Data Standards Cluster is one of 30 Collaboration Areas in ESIP, each dedicated to exploring and solving particular Earth science data challenges. esipfed.org/collaborate



CREDIT: NOAA PACIFIC ISLANDS FISHERIES SCIENCE CENTER

ESIP STRATEGY AND FOCUS

2021-2026 STRATEGIC THEMES

- THEME 1: MAKING EARTH SCIENCE DATA MATTER - INCREASE USE AND PROMOTE THE VALUE OF EARTH SCIENCE DATA AND INFORMATION
- THEME 2: ELEVATING EARTH SCIENCE DATA PROFESSIONALS
- THEME 3: PROMOTING A HEALTHY AND INCLUSIVE CULTURE
- THEME 4: INCREASING EARTH SCIENCE COLLABORATION INTERNALLY AND WITH PARTNER ORGANIZATIONS
- THEME 5: LEADING INNOVATION IN EARTH SCIENCE DATA FRONTIERS

[ESIPFED.ORG/STRATEGY](https://esipfed.org/strategy)

“

What fuels a culture of innovation? Build a diverse, collaborative, and supportive team that creatively solves problems with a safety net that embraces failure. ”

- CAITLIN KONTGIS, HEAD OF SCIENCE, IMPACT OBSERVATORY
Opening Plenary: Creating a Culture of Innovation and Working at Frontiers

January 2021 Meeting

2021: LEADING INNOVATION IN EARTH SCIENCE DATA FRONTIERS

ESIP's theme for 2021 was Leading Innovation in Earth Science Data Frontiers. The conversations in ESIP Meetings, webinars, and workshops ranged from space and satellites to mountain snow to marine navigation, from software development to developing soft skills, from innovative partnerships to grassroots citizen science. As a strategic theme for ESIP, the organization will continue to hold space for Earth science data professionals to seek the horizons in data stewardship, public-private partnerships, and emerging technology.

2022: DATA FOR ALL PEOPLE: FROM GENERATION TO USE AND UNDERSTANDING

How is trust built for Earth science and related data? How does data get to those who need it?

All people, including data professionals, researchers, public officials, and communities all need access to usable data and information. Earth science data in particular can play a critical role in decision-making, especially in conjunction with other data. ESIP's theme for 2022 will dive into the technology, data literacy, and process transparency that influence data generation, use, and understanding.

A FEAST OF COLLABORATION

There is no secret in ESIP's sauce. Collaboration, partners, and leadership are staple ingredients, but the community potluck of shared knowledge and data is made through volunteer, crowdsourced cooking. Cross-collaboration in ESIP means “please pass the salt.”

For example, a Discovery Cluster call last fall included representatives from 12 different Collaboration Areas. ESIP also brought on Lindsay Barbieri as the Agriculture and Climate Fellow through a one-year grant from the Robert and Patricia Switzer Foundation. Her work is dedicated to bridging projects and communication between clusters, taking note of opportunities, and identifying new tools to fuel collaboration.

MEETINGS

ESIP's virtual gatherings are not the kind of lectures you mute, check email, or zone out through the haze of Zoom fatigue. Already a robust community of digital collaborators, ESIP continued to extend the collaborative meeting experience to virtual spaces during the COVID-19 pandemic.

ESIP's community-led virtual meetings flourished in [January 2021](#) and [July 2021](#), with digital meeting technology and resources designed to maximize interactivity and support community organizers in taking their breakout sessions to the next level. These organizers stepped up and showcased what ESIP can do as a community. As an organization, that meant investing in session design training and consultations led by Master Facilitators for both session organizers and ESIP staff to design engaging and productive sessions. Platforms like QiqoChat, Slido polls, breakout rooms, collaborative notes documents, and Slack were key. Staff worked hard to reimagine virtual versions of the Research Showcase, our poster and demo event, and our interactive pitch session. [FUNDing Friday](#) participants noted that the digital events tapped into new and meaningful exchanges. The meetings seeded ideas and laid the groundwork for ongoing collaboration throughout the rest of the year in [collaboration areas](#) and the [ESIP Lab](#).

MEETINGS BY THE NUMBERS

2 VIRTUAL MEETINGS 828 MEETING ATTENDEES

274 SPEAKERS 77 SESSIONS 295 FIRST TIMERS

>70 COMMUNITY-LED BREAKOUT SESSIONS

73 RESEARCH SHOWCASE POSTERS, DEMOS, AND MORE

Attendance and participation increased in ESIP's online conferences with much praise for designing and hosting top-notch virtual meetings. This has resulted in additional requests for workshop design and support in 2021 and 2022. At the 2021 AGU Fall Meeting, one ESIP participant said, "Please don't change ESIP virtual meetings, they are the best." Offering great digital collaboration means continuing to embrace change. High standards for engagement and deliberate use of digital tools is essential as virtual gatherings continue evolving. ESIP will continue to build upon each meeting's success with the introduction of new tools and approaches to maximize engagement and keep community at the heart of all gatherings, both in-person and virtual.

JANUARY 2021

PLENARIES

OPENING PLENARY: CREATING A CULTURE OF INNOVATION AND WORKING AT FRONTIERS

Speakers: Caitlin Kontgis, Twila Moon

PLENARY: INNOVATION AND NEW FRONTIERS IN AI AND ML IN THE EARTH SCIENCES

Speakers: Hannah Kerner, Lyndon Estes, Lexie Yang

PLENARY: INNOVATIONS IN OPEN SEARCH AND DISCOVERY

Speakers: Dan Brickley, Natasha Noy

Get a fast-paced overview of the [January 2021 Meeting Highlights](#) and other recordings on ESIP's YouTube channel.

JULY 2021

PLENARIES

OPENING PLENARY: INNOVATE @ ESIP

Contributors: Agbeli Ameko, Aparna Bamzai, Ben Letcher, Hamed Alemohammad, Kelsey Breseman, Joe Hamman, Kathe Todd-Brown, Nga Chung, Annie Burgess, Sara Lubkin, and Leslie Hsu

PLENARY IN HONOR OF DR. PETER FOX: X-INFORMATICS - LESSONS LEARNED FROM DATA AND INFORMATION IN RESEARCH

Speakers: Ahmed Eleish, Robert Hazen, and Xiaogang (Marshall) Ma

PLENARY: FRONTIERS OF EXPLORATION AND DATA MANAGEMENT ON MARS

Speakers: Hiro Ono, Sara Bond

Experience the collaboration and innovation in the [July 2021 Meeting Highlights](#) on the ESIP YouTube channel.



FIRE ECOLOGISTS DISCUSS WILDFIRE IMPACTS IN A FIELD OF FIREWEED IN WRANGELLS-ST. ELIAS NATIONAL PARK, ALASKA. CREDIT: RACHEL LOEHMAN, ALASKA SCIENCE CENTER/USGS

COLLABORATIONS

CLUSTERS

Cluster participants are professional volunteers who come together to discuss, learn, develop solutions, and seek opportunities in Earth science data, leveraging each others' expertise to address challenges at their home institutions.

Community-led collaborative groups centered on domain or technical areas are called clusters. ESIP has 30+ collaboration areas, including a handful of standing committees that govern ESIP. Most meet monthly and also coordinate sessions at the ESIP Meetings in January and July. Cluster Zoom calls, or telecons, look like webinars, working sessions, discussions, breakout groups, and brainstorm. Many clusters co-author articles or guidelines together, share knowledge through invited presentations, build research networks, mentor new participants and researchers in broadening their data skills, and many contribute to additional ESIP programs like the Data Help Desk, committees and elected leadership, and ESIP Lab. The ESIP Community Fellows play a critical role in supporting several clusters each year.

Clusters are not designed to exist forever. Rather, they spin up as a topic or research question gathers a critical mass of participants and interest, and then spin down as goals are achieved or attention moves elsewhere. The **cluster life cycle concept** is a key way that ESIP is able to cultivate community-led collaborations in new and emerging areas of interest in Earth science data.

CREDIT:
 1. DAVE JONES/STORMCENTER COMMUNICATIONS
 2. ANDREA THOMER, UNIVERSITY OF MICHIGAN
 3. MARGARET MOONEY/SSEC, UNIVERSITY OF WISCONSIN-MADISON
 4. JULIEN CHASTANG/NCAR (WINNER OF THE 2021 ESIP PHOTO CONTEST)



2.



1.

3.



4.



Collaboration areas are the heart of ESIP's active partnership ecosystem.

Collectively, clusters and technical committees are called collaboration areas by the ESIP community. Administrative committees help guide and govern ESIP. Join a monthly telecon, contribute to a cluster project, or connect with other Earth science data professionals: esipfed.org/collaborate

COLLABORATION AREAS

CLUSTERS

- | | |
|---|---|
| <ul style="list-style-type: none"> • Agriculture and Climate • Air Quality • Biological Data Standards • Cloud Computing • Coalition on Publishing Data in the Earth and Space Sciences (COPDESS) • Community Data • Community Ontology Repository (COR) • Community Resilience • Data Management Training Clearinghouse Working Group • Data Readiness (new in FY2021) • Documentation • Disaster Lifecycle • Discovery | <ul style="list-style-type: none"> • Drones • E2SIP • Envirosensing • Information Quality • IM Code Registry • Machine Learning • Marine Data • Physical Sample Curation (new in FY2021) • Public-Private Partnerships • Research Object Citation • Schema.org • Semantic Harmonization • Soil Ontology and Informatics (new in FY2021) • Sustainable Data Management |
|---|---|

TECHNICAL COMMITTEES

- | | |
|---|---|
| <ul style="list-style-type: none"> • Data Stewardship • Education | <ul style="list-style-type: none"> • Information Technology and Interoperability (IT&I) • Semantic Technologies |
|---|---|

ADMINISTRATIVE COMMITTEES

- | | |
|---|---|
| <ul style="list-style-type: none"> • Finance Committee • Governance Committee • Meetings Committee | <ul style="list-style-type: none"> • Nominations Committee • Partnership Committee • Program Committee |
|---|---|

PROJECT HIGHLIGHTS

EDUCATION COMMITTEE

WHAT WE DID: Organized “Exploring Earth, Wind, and Fire via Earth Science Data,” a workshop that showed 50 K-12 educators how to use data tools like UNAVCO Velocity Viewer, My NASA Data, CrowdMag, and EnROADS to teach Earth science concepts.

WHY WE DO IT: For comments like this from teachers, “Excellent info, can’t wait to incorporate it into my curriculum!”

SUSTAINABLE DATA MANAGEMENT

WHAT WE DID: Combined CARE, FAIR, and TRUST frameworks and [presented at the AGU Fall Meeting](#).

WHY WE DO IT: To effectively and authentically collaborate with Indigenous communities, data repositories need better ways to protect data sovereignty while ensuring data access and use.

SCHEMA.ORG

WHAT WE DID: Updated [science-on-schema.org guidelines](#) for repository operators and others using schema.org for scientific datasets.

WHY WE DO IT: Following consistent conventions to provide schema.org markup in dataset landing pages improves data discovery through search engines.

INFORMATION QUALITY

WHAT WE DID: Published a [journal article in Data Science Journal](#) on data quality and global access to Earth science data.

WHY WE DO IT: Availability and consistent curation or dataset quality information is critical for decisions about whether to use or reuse datasets for future scientific research or policy-making.



LOS ANGELES, CA LIT UP AT NIGHT.
CREDIT: NASA

AIR QUALITY HACKATHON

ESIP IN ACTION

A hackathon is a short competition that brings together teams to solve a single, specific issue. It's a way of gamifying knowledge generation and sharing to speed up and foster creative problem solving. Esri was a key partner in this activity, providing demos, support, and access to the ArcGIS Online Platform, as well as prizes for the competition teams.

The summer hackathon's objective was to experiment with three end-user need statements and use cases to see how to best analyze, present, or interact with data for the air quality community.

1. City of Los Angeles, CA: How a local government can better reach individuals with actionable information regarding the threat of adverse air quality.
2. Town of Cheverly, MD: How to understand the risk due to air quality while gathering useful information to decide family activity.
3. Parent of an asthmatic child: How to use citizen science to build a year-long baseline of localized air quality.

The group gathered in May and June to do prep work and form three core teams around the use cases, pulling in more than 30 people from a dozen different ESIP partner organizations. Then, [during the July 2021 ESIP Meeting](#), the teams pulled in new members and developed preliminary ideas. At the cluster's monthly call in August, the teams shared what they had developed and laid out plans for continued work.

PARTNERSHIPS

Partner organizations create the stable backbone of ESIP's collaborative infrastructure.

From meetings to telecons, individual participation is open to everyone and it is not a requirement for participants to be part of member organizations. Organizations can become ESIP partners with voting representatives and volunteers who often help lead as cluster chairs, session organizers, and committee members. Additionally, some partner organizations step up as financial contributors and become sponsors.

NEW PARTNERS

Welcome to our new partners!

OCEAN DATA ALLIANCE
oceandataalliance.com

EARTH BIG DATA LLC
earthbigdata.com

CASE CONSULTANTS INTERNATIONAL
caseconsultantsinternational.com

RIVERSIDE TECHNOLOGY, INC.
riverside.com

BLUE HILL OBSERVATORY & SCIENCE CENTER
bluehill.org/observatory

SCIENCE APPLICATIONS INTERNATIONAL CORPORATION (SAIC)
saic.com

NATIONAL MICROBIOME DATA COLLABORATIVE
microbiomedata.org

MASSIVE CONNECTIONS LLC
massiveconnections.com

MARINE GEOSCIENCE DATA SYSTEM
marine-geo.org

HELMHOLTZ METADATA COLLABORATION - EARTH AND ENVIRONMENT HUB
helmholtz-metadaten.de/en/earth-and-environment

SPONSORS

ESIP is a community that spans multiple sectors including government, academic institutions, and the private sector. Sponsoring ESIP brings an organization's financial support along with products, expertise, and people. We are grateful for our growing sponsorship from the following organizations.

MICROSOFT
Premium Gold Sponsor
microsoft.com

ESRI
Premium Gold Sponsor
esri.com

SCIENCE APPLICATIONS INTERNATIONAL CORPORATION (SAIC)
Premium Silver Sponsor
saic.com

AGU
Research Showcase Sponsor
agu.org

ELEMENT 84
Social Sponsor
element84.com

AMAZON WEB SERVICES (AWS)
In-kind Sponsor
aws.amazon.com

FIGSHARE
In-kind Sponsor
figshare.com

FEDERAL PARTNERS

NASA, NOAA, and USGS provide the foundation of funding and support for the ESIP Community. Multiyear cooperative agreements with our federal partners focus on collaboratively meeting needs in Earth science data management, engaging a broad community to do so. Even with different data and missions, each agency shares challenges like navigating commercial partnerships, moving data to the cloud, and connecting with domain scientists and the next generation.

U.S. GROUP ON EARTH OBSERVATIONS (USGEO)

ESIP assisted the Center for Law and Spatial Policy to hold the [USGEO](#) workshop “Big data use in wildfire management: How to not get burned by the legal challenges of data sharing” in October 2021 with 25 participants and another 50 observers diving into the challenges of sharing of commercial data.

NASA

ESIP supports the annual [Earth Science Data System Working Groups \(ESDSWG\)](#) and runs the evaluation process for the [Advanced Information Systems Technology \(AIST\) Program](#). ESIP Lab Director Annie Burgess is the Technical Chair of the Collaboration Methods in Technology Infusion (CMTI) Working Group and coordinates the [Ignite@AGU](#) rapid-fire storytelling event.



IMAGE CREDIT: NASA

NOAA

In August 2021, ESIP helped organize the [NOAA Environmental Data Management Workshop \(EDMW\)](#) and the third [NOAA AI Workshop](#) in September 2021 on leveraging artificial intelligence in environmental sciences. The ESIP Lab and NASA’s Big Data Program are piloting the NOAA Cloud Pathfinder initiative for next-gen satellites.

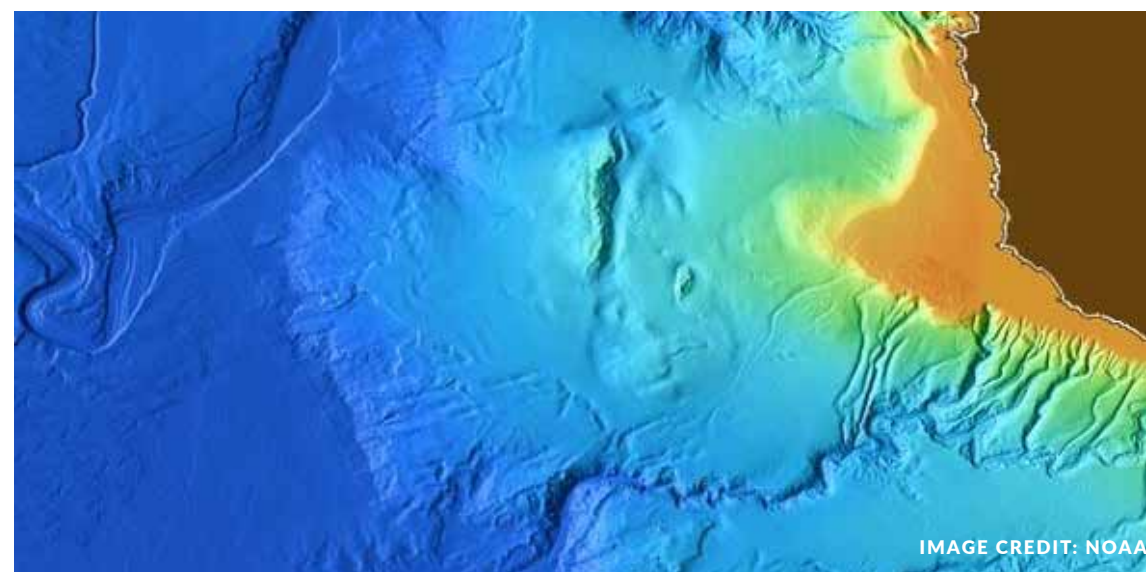


IMAGE CREDIT: NOAA

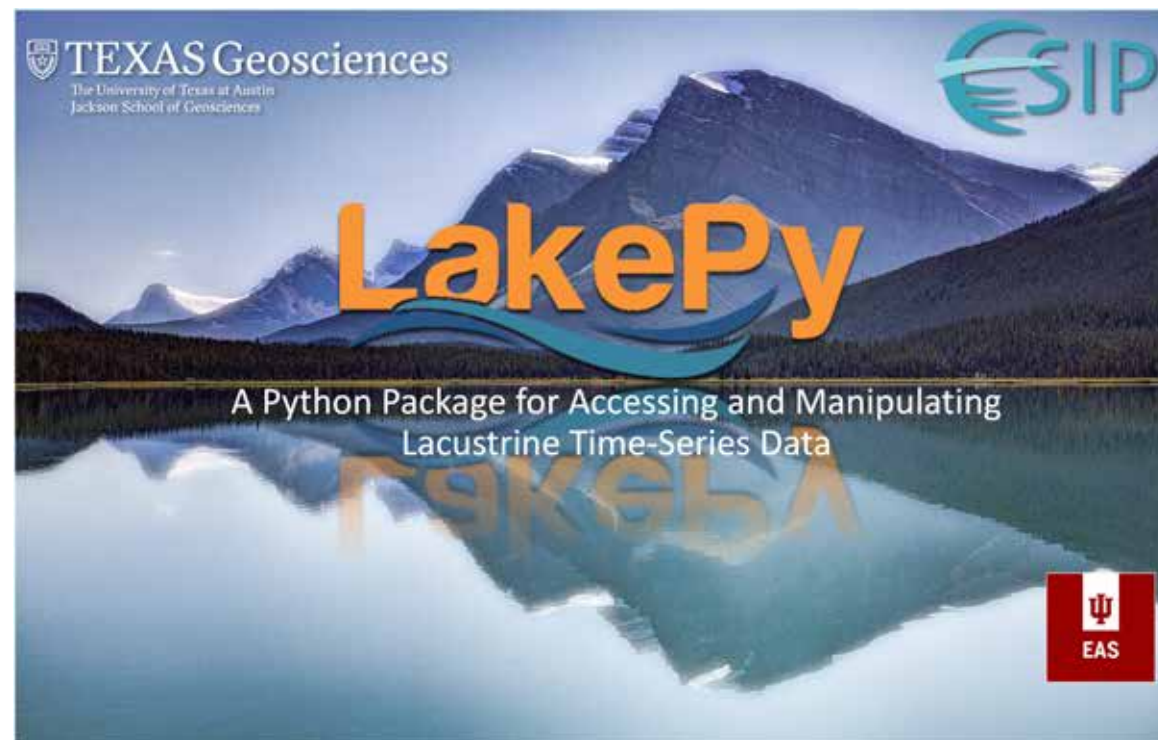
USGS

In May 2021, ESIP and the [Community for Data Integration \(CDI\)](#) co-convened an early-career networking event at the [CDI Workshop](#). This event, held on an innovative virtual platform called Gather.town, included more than 30 early career individuals from ESIP and USGS.



IMAGE CREDIT: USGS

ESIP LAB



ESIP's agility is showcased in the ESIP Lab, which provides small-grant funding opportunities for Earth science technology research projects. Each project must outline a specific learning objective, and rather than convincing funders that a proposal has all the answers already, the ESIP Lab looks at roadblocks that a small investment can help overcome. The Lab also provides a collaborative environment, access to tools and cloud resources, and support to innovate.

In the past year, several previously funded projects have reached important milestones and demonstrate how a small monetary investment can grow into bigger endeavors that can earn more traditional funding.

[GeoWeaver](#), created by Ziheng (Jensen) Sun from George Mason University, is one such example. An [ESIP Lab-funded project from 2018](#), the software is a browser-based, open source interface that enables users to easily compose full-stack workflows that tap into online spatial data facilities, high-performance computation platforms, and open-source, deep learning libraries. Initially funded with \$10,000, GeoWeaver went on to become a 2018 National Geospatial Intelligence Agency/InnoCentive Challenge Winner and received \$900,000 earlier in 2021 through the [NASA Advancing Collaborative Connections for Earth System Science \(ACCESS\) Program](#).

Another example is the [LakePy](#) project, led by Jake Gearon from Indiana University. Lake-level data are incredibly important to federal and local governments, scientists, and citizens. Until now, accessing lake-level data involved laborious data preparation and wrangling. LakePy was developed to instantly deliver lake water levels for more than 2,000 lakes scattered across the globe using the pythonic, user-centered front-end to the [Global Lake Level Database](#), which Gearon developed while pursuing his master's work at the University of Texas, Austin. Now a 2022 ESIP Community Fellow, Gearon presented LakePy at an [ESIP IT&I Tech Dive](#), which resulted in two new committers to this important open-source project.

FUNDED PROJECTS

DEEP LEARNING-BASED SUBMESOSCALE OCEAN EDDY DETECTION ON THE AMAZON WEB SERVICE CLOUD

Jianwu Wang, UMBC
8/30/2021 - 3/30/2021

COMPARISON OF MACHINE LEARNING TECHNIQUES FOR PREDICTING COMPLEX FLOWS AT THE BREACH OF THE GREAT SALT LAKE

Som Dutta, Utah State University
8/30/2021 - 3/30/2021

DEVELOPING A CLOUD-BASED, OPENSOURCE PLATFORM FOR AN AUTOMATIC, HIGH-THROUGHPUT MONITORING SYSTEM TO SAFEGUARD STREAM WATER QUALITY

Tao Wen, Syracuse University
8/30/2021 - 3/30/2021

DEVELOPING AN ENVIRONMENTAL ENFORCEMENT DATA PORTAL FOR GRASSROOTS AND CONGRESSIONAL ACTION

Kelsey Breseman, Environmental Data and Governance Initiative
4/8/2021 - 11/8/2021

CLOUD-BASED, OPEN SCIENCE MACHINE LEARNING TUTORIALS FOR EARTH SCIENCE

Yuhan Rao, NCICS
4/1/2021 - 11/1/2021

PILOTING THE OSDU PLATFORM FOR INTER-STATE GEOLOGICAL SURVEY DATA MANAGEMENT FOR SYNTHETIC 3D MAPPING INITIATIVES

Gary Motz, Indiana Geological Survey
4/2/2021 - 11/2/2021

MAKING DATA EDGY

ESIP IN ACTION

Politics puts some researchers on edge, especially when they feel data and science should be cool, calm, and objective. But the rough edges of data accessibility intersect with policy accountability. Kelsey Breseman is a civic science fellow with the [Environmental Data and Governance Initiative \(EDGI\)](#) and helps coordinate EDGI's [Environmental Enforcement Watch](#). She is the project lead on an ESIP Lab project called "Developing an Environmental Enforcement Data Portal for Grassroots and Congressional Action."

EDGI and the Environmental Enforcement Watch work on stewarding and providing access to public federal data to help communities, civic organizations, reporters, and educators connect the dots and take action on regional and local pollution. Here are some of their projects that rely on digital data portals:

- [Watershed Notebook](#): Data science tool to examine water pollution and polluters.
- [Climate Change Notebook](#): Upcoming data science tool to examine major greenhouse gas contributors.
- [Congressional Report Cards](#): Analysis and data presentations by district and state based on violations of environmental laws, inspections of polluting facilities, and enforcement actions by the EPA. [También disponible en español.](#)

"Environmental Enforcement Watch's work is grounded in the real challenges communities face when trying to use federal environmental data to hold polluters accountable," Breseman said. "Environmental Enforcement Watch produces data science tools with and for communities impacted by pollution — tools they can use to produce on-the-ground results."

Breseman works alongside Sara Wylie, Eric Nost, Steve Hansen, and Andre Stackhouse on the ESIP Lab project. Their work focuses on refining the digital interfaces of EDGI tools to continue making them easier to use and more insightful for non-technical users.



CREDIT: NOAA

AWARDS

An important aspect of the ESIP community is recognizing the outstanding accomplishments, achievements, and service to our community by individual participants. [Read more.](#)

CATALYST AWARD

Given to participants who have brought about positive change in ESIP and inspired other members to take action. Selected by the President, the award recognizes exceptional volunteer efforts and enthusiasm.

ZIHENG (JENSEN) SUN, GEORGE MASON UNIVERSITY

WHAT I DO: Geoweaver is an easy utility tool to orchestrate scientific workflows and preserve model run history.
WHY I DO IT: What started as an ESIP Lab project has grown much bigger and won awards and grants. I want to help other ESIP participants develop new tools and use existing ones smarter to together realize the dream of “Earth AI.”

ESIP PARTNER OF THE YEAR

This award, selected by the Partnership Committee, honors an ESIP partner organization that best exemplifies the spirit of ESIP. This is often through collaboration, supporting data exchange, contribution to the ESIP community, or leadership in Earth science data.

NASA JET PROPULSION LABORATORY

JPL exhibits the depth and breadth of partnership valued by ESIP. More than a dozen JPL staff collaborate in ESIP, from meeting participation, chairing committees and clusters, to proposing and leading interactive meeting sessions. JPL contributes as ESIP Community Fellows and early career staff as well as top senior employees who have many years of experience.

MARTHA MAIDEN AWARD

Named for Martha E. Maiden, Program Executive for Earth Science Data Systems at NASA, the award honors individuals who have demonstrated leadership, dedication, and a collaborative spirit in advancing the field of Earth science information.

HAMPAPURAM “RAMA” RAMAPRIYAN, SCIENCE SYSTEMS AND APPLICATIONS, INC.

WHAT I DO: I dedicated 30+ years to the NASA Earth Science Data Information System (ESDIS) project, managing and contributing to data systems development, science data processing, information quality, stewardship, and preservation.
WHY I DO IT: It's crucial to build up the next generation of Earth scientists and data managers. What a good feeling knowing how widely useful our data and systems are on a global scale to support scientific research and applications!

PRESIDENT'S AWARD

Selected by the current ESIP President, the award recognizes a participant who has made significant, tangible contributions to ESIP during the previous year.

REBECCA KOSKELA, RESEARCH DATA ALLIANCE (RDA)

WHAT I DO: In a word — lead. Which can take many forms, including heading up the search committee for ESIP's new Executive Director.
WHY I DO IT: I'm a long-standing ESIP participant and collaboration is what our community stays grounded in.

RASKIN SCHOLAR

Given to a current graduate student in the Earth or computer sciences, the scholarship is named for longtime ESIP community member Robert G. Raskin, and seeks to promote collaboration, research support, and exposure for talented students with an interest in community evolution of Earth science data systems. [Read more.](#)

CORA VAN HAZINGA, SALEM STATE UNIVERSITY

WHAT I DO: I study geo-information science, specifically remote sensing techniques to identify the mechanics of tectonic and magmatic strain accommodation in the Turkana region of the East African Rift.
WHY I DO IT: A geomorphology class opened my eyes to the possibilities of technology. Interdisciplinary collaboration is what excites me most, bringing together GIS, geology, and remote sensing.



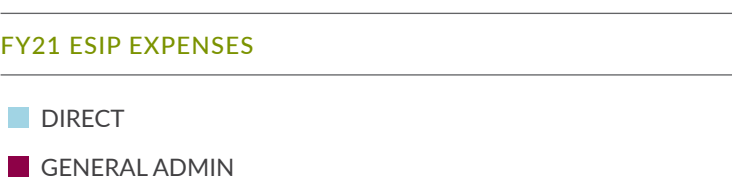
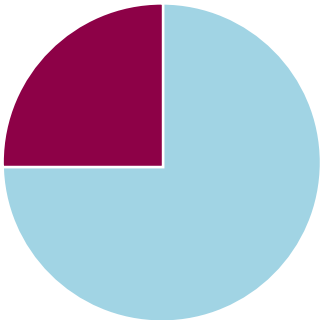
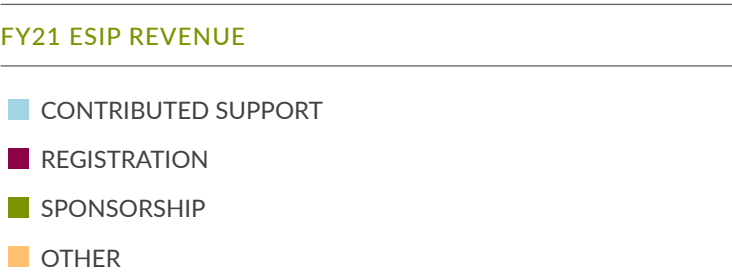
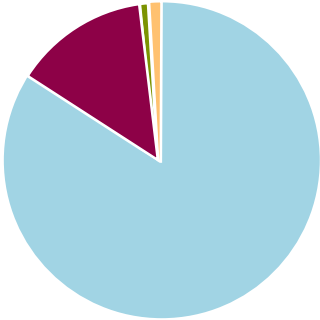
CORA VAN HAZINGA'S WORK FOCUSES ON THE TURKANA REGION IN EASTERN AFRICA.
 CREDIT: KARIUKI CHEGE/UNSPLASH

FINANCIAL UPDATE

ESIP’s revenue comes primarily from federal grants and subcontracts, as well as meeting registrations, with a portion coming from sponsorship. The COVID-19 pandemic impacted revenue primarily by decreasing meeting registration revenue, however, sponsorships increased as well. ESIP’s expenses include staff salaries, support for our collaborative infrastructure, meetings, and travel expense. COVID-19 reduced travel and in-person related meeting expenses in FY21.

SUPPORT AND REVENUE	FY2021 TOTAL	FY2020 TOTAL
GOVERNMENT GRANTS/CONTRACT/UNIV	\$718,913	\$1,061,944
SPONSORSHIP	\$79,611	\$11,686
REGISTRATION	\$105,684	\$183,689
OTHER	\$584	\$8,489
TOTAL SUPPORT AND REVENUE	\$904,792	\$1,265,808
EXPENSES		
PROGRAM SERVICES	\$575,812	\$913,013
MANAGEMENT AND GENERAL	\$298,151	\$304,004
TOTAL EXPENSES	\$873,963	\$1,217,017
CHANGE IN NET ASSETS	\$95,829	\$48,791
NET ASSETS, BEGINNING OF YEAR	\$177,699	\$128,908
NET ASSETS, END OF YEAR	\$273,528	\$177,699

Note: These results have not been audited at press time; ESIP is audited annually and financial statements can be found at esipfed.org/about/funding-and-financials



“Innovation often requires working in an environment where the supporting infrastructure and knowledge is not complete. Know the frontier is a place of risk and consciously sign up for it.”

- TWILA MOON, RESEARCH SCIENTIST, NATIONAL SNOW AND ICE DATA CENTER
Opening Plenary: Creating a Culture of Innovation and Working at Frontiers

January 2021 Meeting



BURNED TREES STAND STARK AFTER THE DIXIE FIRE IN CALIFORNIA IN 2021.
CREDIT: NASA

ESIP LEADERSHIP



ESIP'S STAFF IS FULLY REMOTE, SO IT MEANT A LOT FOR SUSAN, PATTY, MEGAN, AND ANNIE TO GATHER FOR A STAFF RETREAT IN SOUTH CAROLINA IN SEPTEMBER 2021.

As a volunteer organization, ESIP is led by the community and is truly a team effort between ESIP staff, the Board of Directors, the Program Committee, Cluster Chairs, Community Fellows, and the hundreds of people who contribute to ESIP.

STAFF

SUSAN SHINGLEDECKER
Executive Director

ANNIE BURGESS
Lab Director

MEGAN CARTER
Community Director

PATTY ALLEN
Operations Director

ALLISON MILLS
Communications Manager

LINDSAY BARBIERI
Agriculture and Climate Fellow

ELECTED LEADERSHIP

BOARD OF DIRECTORS

ESIP elects its officers, representatives, and committee chairs prior to the Annual Partner Assembly Meeting during the ESIP January Meeting. The Board meets quarterly to govern ESIP.

KEN CASEY, PRESIDENT
Data Stewardship Division, NOAA

DENISE HILLS, VICE PRESIDENT
Geological Survey of Alabama

MIKE DANIELS, PARTNERSHIP COMMITTEE CHAIR
National Center for Atmospheric Research (NCAR)

BILL TENG, GOVERNANCE COMMITTEE CHAIR
NASA Goddard Earth Sciences Data and Information Services Center (GES DISC)

TRACY PILONE, FINANCE COMMITTEE CHAIR
Element 84

SARAH RAMDEEN, NOMINATIONS COMMITTEE CHAIR
Lamont-Doherty Earth Observatory of Columbia University

CYNTHIA PARR, AT-LARGE BOARD MEMBER
USDA

NANCY HOEBELHEINRICH, AT-LARGE BOARD MEMBER
Knowledge Motifs LLC

LESLEY WYBORN, AT-LARGE BOARD MEMBER
Australian National University

PROGRAM COMMITTEE

The ESIP Program Committee meets monthly to guide ESIP programs and includes the President, Vice President, and all the technical and administrative committee chairs.

DENISE HILLS, VICE PRESIDENT, PROGRAM COMMITTEE AND MEETINGS COMMITTEE CHAIR
Geological Survey of Alabama

KEN CASEY, PRESIDENT
Data Stewardship Division, NOAA

MIKE DANIELS, PARTNERSHIP COMMITTEE CHAIR
National Center for Atmospheric Research (NCAR)

BILL TENG, GOVERNANCE COMMITTEE CHAIR
NASA Goddard Earth Sciences Data and Information Services Center (GES DISC)

TRACY PILONE, FINANCE COMMITTEE CHAIR
Element 84

SARAH RAMDEEN, NOMINATIONS COMMITTEE CHAIR
Lamont Doherty Earth Observatory at Columbia University

AMBER BUDDEN, DATA STEWARDSHIP COMMITTEE CHAIR
National Center for Ecological Analysis and Synthesis (NCEAS)

CARLA MCAULIFFE, EDUCATION COMMITTEE
TERC

DEREK MASAKI, INFORMATION TECHNOLOGY AND INTEROPERABILITY (IT&I) COMMITTEE CHAIR
USGS

BRANDON WHITEHEAD, SEMANTIC TECHNOLOGIES COMMITTEE
Manaaki Whenua - Landcare Research

CLUSTER LEADERSHIP

Collaboration is where ESIP's magic happens. With 30 clusters, these leaders bring ESIP's mission down to Earth, bringing together people across industry, government, and academia to solve challenges in Earth science data stewardship.

BILL TENG AND BRIAN WEE
Agriculture and Climate

MIKE LITTLE AND BETH HUFFER
Air Quality

ABBY BENSON
Biological Data Standards

AIMEE BARCIAUSKAS AND SUDHIR SHRESTHA
Cloud Computing

STEVE DIGGS AND ANDREA THOMER
Community Data

ARIKA VIRAPONGSE AND RUPU GUPTA
Community Resilience

KERSTIN LEHNERT
COPDESS

JOHN GRAYBEAL
COR

NANCY HOEBELHEINRICH AND KARL BENEDICT
Data Management Training Clearinghouse Working Group

YUHAN RAO, TYLER CHRISTENSEN, AND ROB REDMON
Data Readiness

KAREN MOE AND DAVE JONES
Disaster Lifecycle

CHRIS LYNNE
Discovery

JANE WYNGAARD
Drones

LESLEY WYBORN AND SIMON COX
E2SIP

SCOTTY STRACHAN, RENÉE BROWN, JOSEPH BELL, AND MARTHA APPLE
Envirosensing

KRISTIN VANDERBILT AND COLIN SMITH
IM Code Registry

YAXING WEI, GE PENG, AND DAVID MORONI
Information Quality

ZIHENG (JENSEN) SUN
Machine Learning

CAROLINA BERYS-GONZALEZ AND CHRIS OLSON
Marine Data

SARAH RAMDEEN, VAL STANLEY, AND JOAN DAMEROW
Physical Sample Curation

CRISTA STRAUB, CARL SHAPIRO, AND KARL BENEDICT
Public-Private Partnerships

MARK PARSONS AND MADISON LANGSETH
Research Object Citation

ADAM SHEPHERD AND DOUG FILS
Schema.org

RUTH DUERR AND GARY BERG-CROSS
Semantic Harmonization

KATHE TODD-BROWN, TANJA WILLIAMSON, AND DYLAN BEAUDETTE
Soil Ontology and Informatics

MARGARET O'BRIEN
Sustainable Data Management

COMMUNITY FELLOWS

Each year, an outstanding group of early career researchers working on their graduate and post-doctoral studies supports different ESIP Clusters. Here are the 2021 Community Fellows.

KRISTINA FAUSS, UNIVERSITY OF CALIFORNIA, SANTA BARBARA
Envirosensing Cluster

CHRISTINE GREGG, UNIVERSITY OF MICHIGAN
Community Resilience Cluster

JACKIE GUZ, CLARK UNIVERSITY
Ag and Climate Cluster

QIAN HUANG, UNIVERSITY OF SOUTH CAROLINA
Disasters Lifecycle Cluster

SARA LAFIA, UNIVERSITY OF MICHIGAN
Discovery Cluster

CINDY LIN, UNIVERSITY OF MICHIGAN
Machine Learning Cluster

MARION MCKENZIE, UNIVERSITY OF VIRGINIA
Community Data Cluster

NED MOLDER, UNIVERSITY OF WISCONSIN, MADISON
Public-Private Partnerships Cluster

NOTE FROM THE EXECUTIVE DIRECTOR

2021 was a challenging year for so many. But it was a year in which the ESIP community thrived. We embraced new technologies, welcomed new partners and staff, and expanded our reach and impact. While this Annual Report celebrates our accomplishments over the past year, I have never been one to look backwards. In the words of a mentor of mine, Dr. Mamie Parker from the US Fish and Wildlife Service - “there is a reason your windshield is bigger than your rear view mirror. Don’t look backwards, you aren’t going that way!” While we need reflection and rearview mirrors — and there is so much to celebrate about 2021 in ESIP — we are charging forward into 2022 with energy and enthusiasm.

With a theme of “Data for All People: From Generation to Use and Understanding,” I am excited for the impact that we will have in the coming year. Making data matter to all people, especially communities that have been historically marginalized or who lack access to the data that is crucial for decision making is essential to creating a more just and equitable world. I am excited to see ESIP collaborators work together in this area. One example of this work is a series of workshops we are in discussions to lead this spring in the areas of air quality and environmental justice to help organizations identify and overcome barriers to use NASA data.

In 2022, ESIP will continue to invest in our leadership and our own internal data management. We know that agile communities need leaders who are empowered to make decisions. We will look to support our committee and clusters with the tools they need. Additionally we are excited to roll out a new community database that will greatly enhance our relationships with each of our partner organizations and improve our communications with all of you.

It was wonderful to meet many ESIP community participants in New Orleans in December and it gives me great excitement for ESIP’s virtual January Meeting and our in-person July Meeting in Pittsburgh, PA. I look forward to seeing what the collaboration areas and ESIP Lab do this next year and I am grateful for your participation and support!



Susan Shingledecker
ESIP Executive Director

JOIN US

ESIP welcomes ideas, partnerships, and support from the global community of organizations and individuals who share our vision of being data stewardship leaders.

LEARN MORE

- Network
- Collaboration Areas
- Lab

SEND FEEDBACK

We welcome community feedback at any time. Please send a note to Susan Shingledecker, ESIP Executive Director (Susanshingledecker@esipfed.org).

STAY CONNECTED

- YouTube
- LinkedIn
- Github
- Twitter
- Monday Update

CONTRIBUTE

If you would like to make a financial contribution to support the work of ESIP, please send your contribution by mail to the address: ESIP • 550M Ritchie Hwy #248 • Severna Park, MD 21146 • staff@esipfed.org

COVER PAGE

Satellite imagery is a key part of predicting, tracking, and understanding wildfire. The Aisal Fire burned close to Santa Barbara in 2021. Credit: NASA