



# NASA DEVELOP

## 2023 Year in Review

### Message from the Program

December 2023

Dear DEVELOP Friends & Family,

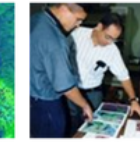
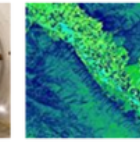
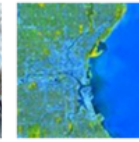
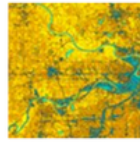
This year was full of change. Some exciting, some scary, some happy, and some sad. The one constant throughout the year was the theme of community. As we celebrated the awesome milestone of 25 years of DEVELOP, we did this together. The anniversary and its many activities served as a poignant reminder that one of the greatest things this program has to offer is the gift of connections.

As Mike Ruiz once said, “DEVELOP is what you make of it.” I’m continuously impressed by what everyone has made out of DEVELOP. I want to share my appreciation to the current DEVELOP team and broader network. Many thanks to the National Program Office staff, the cohort of Leads, Fellows, and Senior Fellows, the network of science advisors and mentors, and all of our past participants and partners. DEVELOP continues to thrive because of you and your efforts. Please read on and enjoy this newsletter to catch up with DEVELOP news and DEVELOPers in 2023.



Cheers,  
Dr. Ross  
DEVELOP Program Manager





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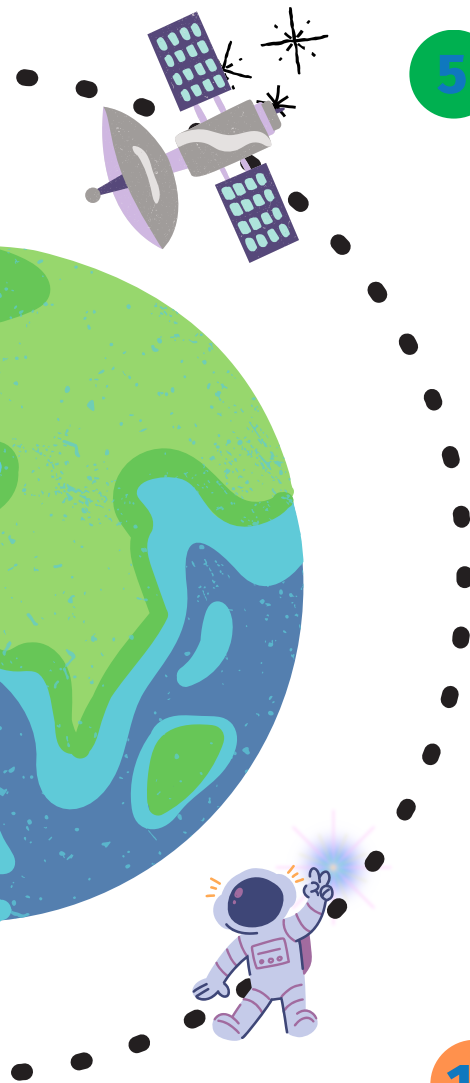
## Join the New DEVELOP Corps

Opportunities for Alumni to Stay Engaged w/DEVELOP

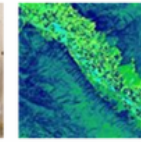
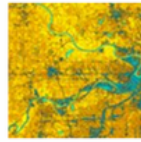
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## Rememberances & Looking Ahead

Remembering Danny Mangosing & Looking Ahead to 2024 and Beyond







# DEVELOP'S 25TH ANNIVERSARY

In 1998, Mike Ruiz brought together three students not knowing the deep impact to come in the next 25 years.

DEVELOP's impact is salient in our alumni's stories, including one recent alum who reflected, *"my perspective, being first generation, is not really knowing much about college and routes in the Earth Sciences. DEVELOP showed me the different career choices... But I never expected myself to be in the position that I am now, which is a Center Lead. I'm excited to see where what I learned in this world takes me."* DEVELOP shows us what the world can be.

When looking back on the last 25 years of DEVELOP's history, it's easy to see all that has changed. But in many ways, the values and vision that guided the creation of DEVELOP live on today. DEVELOP founder, Mike Ruiz, is clear in his continued vision, *"This is what it's all about: the people."* And it's not hard to see just how much this man and his legacy impact every single one of us who becomes a part of it.



Mike Ruiz receives a touching tribute during DEVELOP Day 2023  
Photo Credit: (NASA/Joel Kowsky)

**Happy 25th Anniversary to the entire DEVELOP family!**

[Watch our 25th Anniversary Video HERE!](#)



To celebrate DEVELOP's 25<sup>th</sup> Anniversary, the program hosted meet up events on June 28<sup>th</sup> for current DEVELOPers and alumni at 11 locations across the country. In total, over 130 DEVELOPers came to the events to network and celebrate DEVELOP. The popularity of the events demonstrate DEVELOP's motto: Once a DEVELOPer, always a DEVELOPer!





# In 2023...



41 Projects



79 Partners



164 DEVELOPErs



14 Nodes

## DEVELOP's Bhutan Partnership



Since 2020, NASA has partnered with the U.S. State Department and the Kingdom of Bhutan to strengthen the foundations of STEM in Bhutan through the use of Earth observation information and data. In support of this partnership, DEVELOP hosted nine special projects open to Bhutanese participants studying in the U.S who were supported by various science advisors, often NASA SERVIR team members, in researching elephant habitat and rice crop mapping.

DEVELOP's Bhutan partnership culminated in Summer 2023 with the MSFC Bhutan Agriculture III project and a special celebration at NASA Headquarters with past Bhutanese DEVELOPErs, representatives of NASA SERVIR, NASA Capacity Building, the U.S. State Department, the Kingdom of Bhutan, and the Bhutan Foundation. The festivities included addresses from the aforementioned organizations, a presentation from the summer team on their research and findings, and a group tour of Goddard Space Flight Center.

The Summer 2023 DEVELOP team mapped cropland changes using remote sensing to bolster food security and support rice monitoring. The team identified rice and non-rice training points in Bhutan using SERVIR's Agricultural Classification and Estimation Services (ACES) tool and created crop masks to monitor rice distribution from 2015 to 2022. The goal of this work was to help government agencies within Bhutan make better decisions regarding agricultural practices to practice more sustainable methods, enhance the efficiency of farming, and improve food security throughout the country. Summer participant, Sonam Tshering, will join the Bhutan Foundation as panelist at COP28 in December in Dubai, UAE, speaking on behalf of DEVELOP and the broader NASA Bhutan STEM partnership. We wish her the best of luck at COP28!

Samtse



Paro



 Rice Mask

Wangdue Phodrang

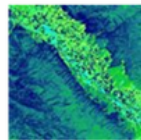
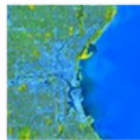
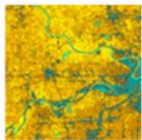


Punakha



▲ The Summer 2023 team's annual rice crop mask outputs from the ACES tool for four dzongkhags, or primary subdivisions, in Bhutan.





## CONFERENCES, EVENTS, & PUBLICATIONS

It was a very busy year at DEVELOP! Between attending conferences, hosting DEVELOP events, and publishing work done by DEVELOPERS, there is a lot to celebrate! This year, members of DEVELOP:

- ✦ SPOKE ON MULTIPLE PANELS, INCLUDING VIRTUALLY AT THE WOMEN OF COLOR IN STEM CONFERENCE HOSTED IN DETROIT, MI AND THE NATIONAL ACADEMIES OF SCIENCE, ENGINEERING, AND MEDICINE'S "THE GEOSPATIAL WORKFORCE CRISIS: A DIVERSITY OF PATHWAYS FORWARD" MEETING
- ✦ PRESENTED AT 22 CONFERENCES & EVENTS, INCLUDING THE AAG ANNUAL MEETING, AGU FALL MEETING, MIDWEST CLIMATE SCIENCE CONFERENCE, AND HAMPTON ROADS SOCIAL JUSTICE CONFERENCE
- ✦ PUBLISHED ONE PEER-REVIEWED JOURNAL ARTICLE \*
- ✦ HOSTED CLOSEOUT PRESENTATIONS FOR EACH OF OUR DEVELOP PROJECTS, PARTICIPATED IN RECRUITING EVENTS, AND MORE!



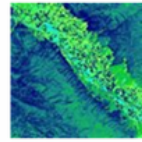
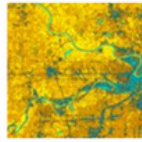
\*To learn more about publishing your project, contact your Lead and Amanda Clayton ([amanda.l.clayton@nasa.gov](mailto:amanda.l.clayton@nasa.gov))

## DEVELOP DAY at NASA HQ



DEVELOP Day is an annual event hosted at NASA Headquarters in Washington, DC that highlights the program's summer projects, participants, and partners! The event kicked off with guest speakers from NASA, including Dr. Nicky Fox and Mr. Dave Young, along with longtime partners from the National Park Service and the Embassy of Chile. The day included a highlight presentation and 10 "flash talks," along with two poster sessions. DEVELOPERS of the Term were announced to highlight team members who exemplified DEVELOP's core values of collaboration, service, passion, and discovery, as well as supported not only their own growth but the growth of their team as well. Three student participants who made an above and beyond contribution to their project were awarded scholarships funded by the Bahethi Foundation. DEVELOP also hosted an alumni spotlight in honor of DEVELOP's 25th Anniversary, with alumni sharing their biggest takeaway from their time in DEVELOP and how DEVELOP contributed to their professional career journeys. DEVELOP Day served to bring together a community of individuals seeking to grow their capacity in order to better serve the Earth sciences.





### SOFTWARE CARPENTRY

DEVELOP participants built their coding capacity through Software Carpentry workshops, benefiting from numerous hours of R, Python, Git, and Unix instruction delivered by accredited Software Carpentry instructors. These workshops acquainted participants with coding fundamentals and best practices, as well as facilitated the application of scripting in their projects.

**2**   
**WORKSHOPS**

**133**   
**PARTICIPANTS**

**35**   
**HELPERS**

### NODE VISITS

With a return to in-person projects in 2022 and DEVELOP’s 25th Anniversary in 2023, DEVELOP’s National Program Office began the new year with visits to DEVELOP offices across the country. Dr. Ross kicked off a trip to the North Carolina and Georgia nodes in week 2 of the spring 2023 term. Members of the National Program Office went on to travel to NASA Ames and JPL, as well as visited the Intermountain West with trips to the Colorado and PUP Wyoming locations in the fall of 2022 and the Idaho node and Salt Lake City (SLC) during the spring 2023 term.



Asheville, NC



NASA Ames



Pocatello, ID



SLC



### POP-UP PROJECTS

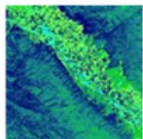
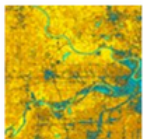
DEVELOP’s Pop-Up Projects (PUP) have been active and successful for a little over a year now, with a new set of universities teaming up with DEVELOP to host projects on their campus. In addition, university professors serve as advisors to offer participants their subject matter expertise. The University of Virginia and the University of Wyoming continued their partnership with DEVELOP this year for the Spring and Summer 2023 terms. In addition to these continued partnerships, DEVELOP also had the honor of welcoming Skidmore College as a host location for the summer term. Plans to expand the PUP network for Summer 2024 are in the works. Partnerships with Texas Tech University, Florida Gulf Coast University, Hunter College, and James Madison University are soon to come.



The Chile Wildland Fires and Aconcagua Basin Agriculture Summer 2023 UVA-PUP teams meet with LaRC Lead Olivia Landry.







## Alumni & Career Pathways After DEVELOP

Our alumni go on to pursue many different and successful careers - these four embody some of the defining traits of potential pathways. Whether you are a recent DEVELOPer or a mid-career professional, who do you see yourself as in the future?

### The Analyst

**Tharini Jeyaprakash (Tara Jey)**

Marshall Space Flight Center - 2011-2012

Tara had always looked up to her immigrant parents and their success in business endeavors. She combined her technical skills and her admiration of her parents to pursue a pathway in investment banking, where she now works as an investment manager.

*"To see how everything works... and the mechanics behind all these decisions is why I got into this industry."*



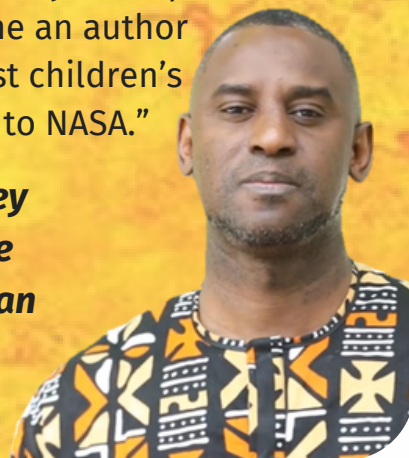
### The Communicator

**Adama BA**

Langley Research Center - 2016

Adama became a DEVELOP Corps Ambassador and is deeply passionate about inspiring others. Motivated by his experiences and stories, he became an author and published his first children's book "Adama Goes to NASA."

*"I share my journey with other people and kids so they can follow their dreams."*



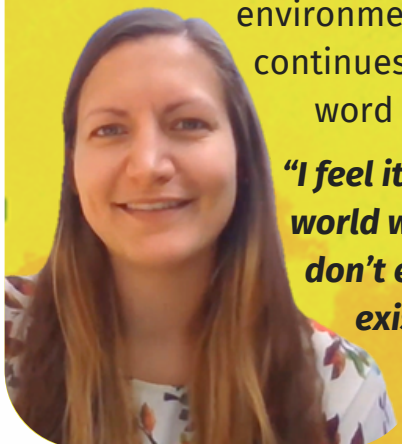
### The Educator

**Kiersten Newtoff**

Goddard Space Flight Center - 2014-2015

Kiersten became an Assistant Professor of Biology at Montgomery College in Maryland, where she teaches ecology, evolution, and environmental science, and she continues to spread the good word of GIS to others.

*"I feel it's my duty to share this world with students. Students don't even know these tools exist. They don't even know this is a field they can go into."*



### The Geospatial Ambassador

**Dr. Chippie Kislik**

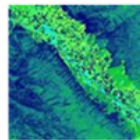
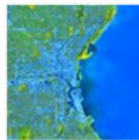
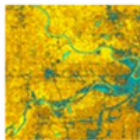
Ames Research Center - 2014-2016

Dr. Kislik is a Pre-sales Engineer with Planet based in San Francisco, where she assists potential customers who want to use satellite imagery in their work. She also was a Fulbright Scholar and pursued her PhD at UC Berkeley.

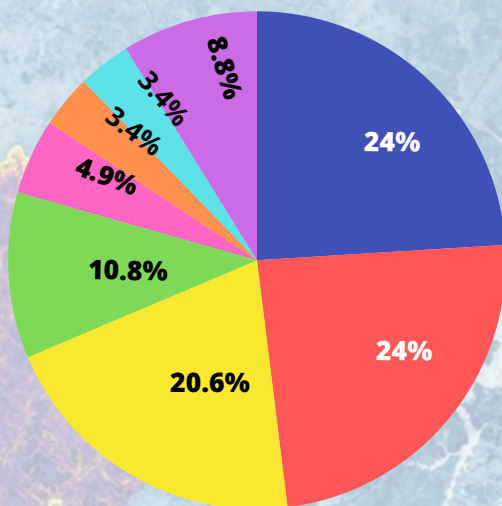
*"Map making is an art. It's so gorgeous, and so I just really wanted to stay part of this industry."*







## Career Pathway Breakdown - 2023 Alumni Survey



- Science, Private Company
- Federal Institution
- Academia
- State/Local Gov
- Gov/GIS Consulting
- Research Org.
- International
- Other

## From Participant to Partner

Many of our alumni never give up their passion for using Earth observations to investigate the research questions they encounter, and then end up becoming partners, like these three DEVELOPERS:

As a Participant:

As a Partner:



**Nicole Keller**  
LaRC - 2020

Quantifying and Mapping Urban Heat to Support Urban Planning Initiatives in Sacramento, California

**LaRC - 2023**

Nicole is the resilience planner for the Richmond Regional Planning District Commission. She noticed, "There was absolutely no data tracking the issue [of pluvial flooding]! So I had the idea to turn back to DEVELOP, this time as a possible partner."



**Jenna Johnston**  
LaRC - 2021

Evaluating the Effects of Land Use and Hydrological Change on Ecosystem Vitality using Remotely-Sensed Data in the Tonlé Sap Lake Basin

**LaRC - 2022**

At the Environmental Collaborative of Ohio, Jenna realized a DEVELOP team would be able to help with, "all of that stuff that we and other partners wanted to dive into, but didn't always have the time or the resources set aside to be able to."



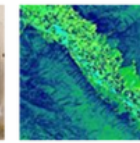
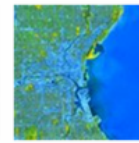
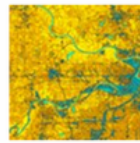
**Sunita Yadav-Pauletti**  
LaRC - 2016  
GSFC - 2017 - 2018

Using NASA Earth Observations to Map Winter Cover Crop Conservation Performance in the Chesapeake Bay Watershed

**North Carolina- 2021 - 2022, 2024**

Dr. Yadav-Pauletti is a crop analyst at the USDA Foreign Agricultural Service. "I have a research mindset - I'm always like 'I'd really like to look into this, but I don't have time.'" She now works with DEVELOP teams on some of the most interesting research questions in Brazil.





## Anai Tene: Fire Lights the Way

Somewhere in the halls of a California middle school walks a girl in the coolest NASA jacket known to man. But what makes this girl's jacket so special, is that her mom gave it to her.

Anai Tene says it is so powerful to be a mom to a daughter. "To see how she looks up to me...I want to see what she's going to do." The mother of two was a DEVELOPer in the summer of 2023, where she worked on a project to predict and prevent wildfires. But this was not Anai's first fight against fire.

Back in 2020, facing the hardships of the pandemic, Anai became an EMT. She then took a leap of faith and applied to FIRE Foundry, a workforce development program designed to prepare recruits for fire-related careers. "I thought only suppression existed. And I'm like, 'Oh, you're telling me there's prevention, too?'" Wanting to learn more about prevention, Anai then applied to DEVELOP and FIRE Foundry ended up as one of the partners on Anai's project.

Fire may have lit Anai's path through the darkness of the unknown, but for others, it's Anai herself who is the shining light. "You're just a very kind person," said one of Anai's co-DEVELOPers, "It's really important for people, especially in the sciences and in STEM in general, to lead with kindness...and you're a very resilient and very kind scientist."

So Anai earned that NASA jacket for her daughter. She earned it through her blood, sweat, and tears as an EMT and as a fire prevention scientist.



Anai with her team at FIRE Foundry

### SHARE YOUR STORY

Every alumni has a story to share, and we want to hear yours! Did you have an unexpected major in college? Did you go on to pursue a unique career, such as a florist, farmer, banker, or lawyer? Are you a first-generation immigrant or graduate? These are exactly the kind of stories we are hoping to share with those who might see themselves in you. Please contact Jane Zugarek ([jane.a.zugarek@ama-inc.com](mailto:jane.a.zugarek@ama-inc.com)) to explore spotlight options and help make the DEVELOP community feel connected and welcoming to all!





# Leads, Fellows, & Senior Fellows in 2023

Meet the Incoming Fellows:



COMM



Jane Zugarek

"I've been developing professionally since my first day as a Fellow. The learning/capacity building hasn't stopped since!"



IA



Maya Hall

"As a DEVELOP participant, I gained skills and accomplished goals I'd never thought possible, and now as a Fellow, I am confident that I can genuinely and authentically help others learn new skills and reach their own goals!"



PC



Marisa Smedsrud

"Enhanced capacity-building opportunities are so special because it's not often that you can be in a role that encourages you to learn and grow as much as this one does."

Meet the Incoming Leads:



GA



Megan Rich

"I'm excited to continue with DEVELOP to build my capacity in leadership and to continue meeting the incredible people who come through the program."



GSFC



Steph Willsey

"This has been a fulfilling opportunity to continue in a program that I've grown to admire. Although it comes with its challenges, I am fortunate to work alongside others who we can lean on and overcome challenges that make each of us better researchers and leaders."



MA



Madi Arndt

"As a participant I was able to build skills and learn about Earth Science. As a Lead, I can't wait to help guide participants so that they also have great DEVELOP experiences!"



MSFC



Cristina Villalobos-Heredia

"As a participant I learned from peers and Fellows about what it means and takes to be an earth scientist. I'm excited to continue to learn from the DEVELOP community and grow my capacity in the earth sciences as an early-career professional."

## And Meet Our Returning Leads, Fellow, & Senior Fellow:



Laramie Plott  
Senior Fellow  
Formerly PC Fellow



JPL



Michael Pazmino  
Continuing Lead



LARC



Olivia Landry  
Continuing Lead



NC



Katie Caruso  
Continuing Lead



GEO



Carli Merrick  
Element Fellow  
Formerly GSFC Lead

## Thank You to Our Outgoing Leads & Senior Fellows!



Celeste Gambino  
Senior Fellow



Cecil Byles  
Senior Fellow



ARC



Lisa Tanh

"DEVELOP has made me the scientist, mentor, and professional that I am, and I've made lifelong friends along the way! I'll forever be grateful for my time spent at DEVELOP!"



MA



Tyler Pantle

"The network of DEVELOP Fellows, both past and present, is the closest and most supportive group of professionals I've ever been a part of!"



PUP



Caroline Williams

"Enhancing my technical and professional skills has been foundational for me. Learning to manage multiple projects and engage with decision-makers are skills that I am eager to continue bringing forth in my career."



CO



Sarah Hettema



GA



Sarah Payne



ID



Ryan Healey



MSFC



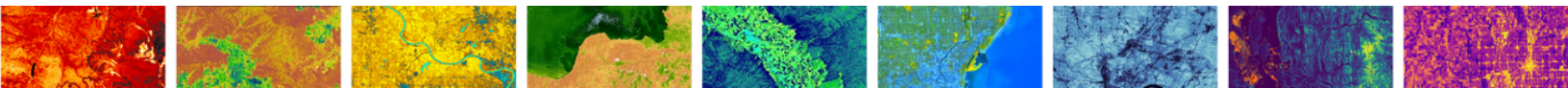
Brienne Minton



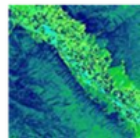
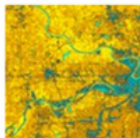
VEJ



Julianne Liu







## WE'VE BEEN UP TO SOMETHING A LITTLE DIFFERENT THIS FALL!

Following a science support contract transition and change to programmatic structure, this fall DEVELOP paused projects. Leads, Fellows, and NPO utilized this time to strategically plan for the upcoming year and accomplish some behind-the-scenes work, including short and long-term initiatives, preparing projects for both the spring and summer 2024 terms, writing thematic white papers, and conducting deep element work.

### Strategic Planning and Leadership Retreat

In September, Leads, Fellows, and NPO got together for a programmatic retreat at Langley Research Center. This was the first time that the new Leads and Fellows got to meet the existing Leads and NPO! This retreat was filled with brainstorming workshops and presentations to plan for the "no fall term" and get a head start on preparing for the upcoming year. There was also plenty of time for fun, including a tour of a NASA Hangar, team dinners, and lots of bonding experiences! Thank you NPO for hosting!



### White Papers & Element Work

Leads and Fellows wrote white papers covering a variety of topics highlighting best practices to guide future DEVELOP projects. The teams worked hard referring to past DEVELOP projects and meeting with subject matter experts and NPO to gather information on the do's and don'ts for each paper. Another initiative was the formation of Element Tiger teams. Led by our new Element Fellows, each team accomplished many tasks, from reviewing past code tutorials and setting up an Impact Analysis Workshop for DEVELOPers, to writing this annual newsletter! This was a great way for Fellows, Leads, and NPO to collaborate on behind-the-scenes work at DEVELOP!



# We received **464** applications for Spring 2024!

## Summer Term Application Window Opens January 15th!

Term Dates

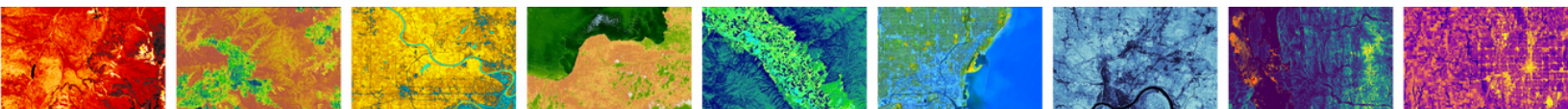
June 3 - August 9, 2024

Application Window

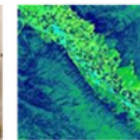
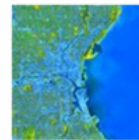
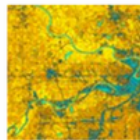
Jan 15 - Feb 23, 2024

## COMING SOON

<https://appliedsciences.nasa.gov/what-we-do/capacity-building/develop/apply>







# Opportunities to Engage

Once a DEVELOPer, always a DEVELOPer! Throughout the 25th Anniversary year, alumni expressed a strong interest in staying engaged and being able to continue to support the program. We listened and are excited to introduce the new “DEVELOP Corps”! DEVELOP Corps expands upon the ‘Ambassador Corps’ to offer alumni multiple paths to support the next generation of DEVELOPers and build their own capacity in different areas. We will continue to grow opportunities we offer throughout 2024 and invite you to join DEVELOP Corps today!

To join, please fill out the [DEVELOP Corps Interest Form](https://forms.gle/gY3F6sGpQtbPPAXZA) at <https://forms.gle/gY3F6sGpQtbPPAXZA>

## GeoCAST

Members of the Geoinformatics Collaborative Alumni Support Team (GeoCAST) help answer technical questions on the DEVELOP DESC that fall within their areas of expertise or interest! The DEVELOP Earth Science Collaborative (DESC) is a Google Group/Forum to assist DEVELOP teams with troubleshooting their project work in Python, R, Google Earth Engine, ArcGIS Pro and more. Joining GeoCast is a low time commitment opportunity for alumni to not only help current participants but also use and expand your own skills in GIS, coding, and many more subjects.

## Ambassador

DEVELOP Ambassadors spread the word at their academic, professional, and/or local communities about DEVELOP. We provide Ambassadors with recruiting materials (e.g. presentations, email templates, and print materials) to use for in-person and virtual recruiting events, classroom visits, email outreach, LinkedIn posts, and other outreach methods! It’s a great opportunity to practice presenting, networking, and leadership skills, as well as help DEVELOP recruit diverse and interdisciplinary participants.

## Subject Matter Expert

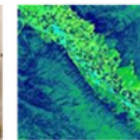
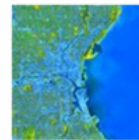
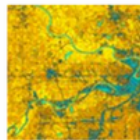
Subject Matter Experts (SMEs) contribute time during the term to support the advising of a project team aligned with your skillsets and experience. Interested candidates share their background and types of projects they could support, and then NPO matchmakes based on projects being conducted. During the term, the SME time commitment would be potentially an hour or so weekly or biweekly, based on availability.

## Node Mentor

Node Mentors engage with a specific DEVELOP office and support teams in an ad hoc way based on your interest. This can be through supporting professional development (meeting with the teams, reviewing resumes, meeting with interested participants, etc.) or technical development (trainings, tech demos, etc.). Node Mentors get connected to the Lead for that office, and the engagement will be organic!







## REMEMBERING DANNY

Daniel Cachaper Mangosing, Jr.

DEVELOP Website Developer & IT Lead

1965 - 2023

The DEVELOP community lost one of its own last summer when Danny Mangosing passed away unexpectedly on July 4th. As DEVELOP's website developer and IT lead, Danny supported participants, Leads & Fellows, and NPO with management of IT assets, virtual machine management, website development, and software management. Danny embodied DEVELOP's core values, and his optimistic outlook on life made him a joy to work with. The Bahethi Foundation awarded three summer participants with student scholarships in his honor. Danny will be deeply missed.

## LOOKING AHEAD

DEVELOP's 25th Anniversary provided the program a chance to reflect on the impact the program has had on its partners, participants, and on the world's understanding of Earth observations. And with a large summer term planned for 2024, it is more important than ever to continue to share our vision with the next generation. A recent DEVELOPer and current Project Coordination Fellow, Marisa Smedsrud, shared what DEVELOP taught her:



**"I think a lot of things are more possible than people think. If you are passionate about something, you really can end up doing something with it. You don't have to take what would be considered likely paths, you can branch out and do stuff that really excites you. Especially with DEVELOP; it's open to career transitioning professionals. There's always time to change your life and do what you're passionate about."**

**DEVELOP: Helping expand worldviews since 1998.**

Much appreciation to the DEVELOP Communications Tiger Team for producing the annual newsletter! Thanks to Jane Zugarek (Communications Fellow), Rachel Seevers (NASA OSTEM Intern), Katie Caruso (NC Lead), Madi Arndt (MA Lead), and Cristina Villalobos-Heredia (MSFC Lead).