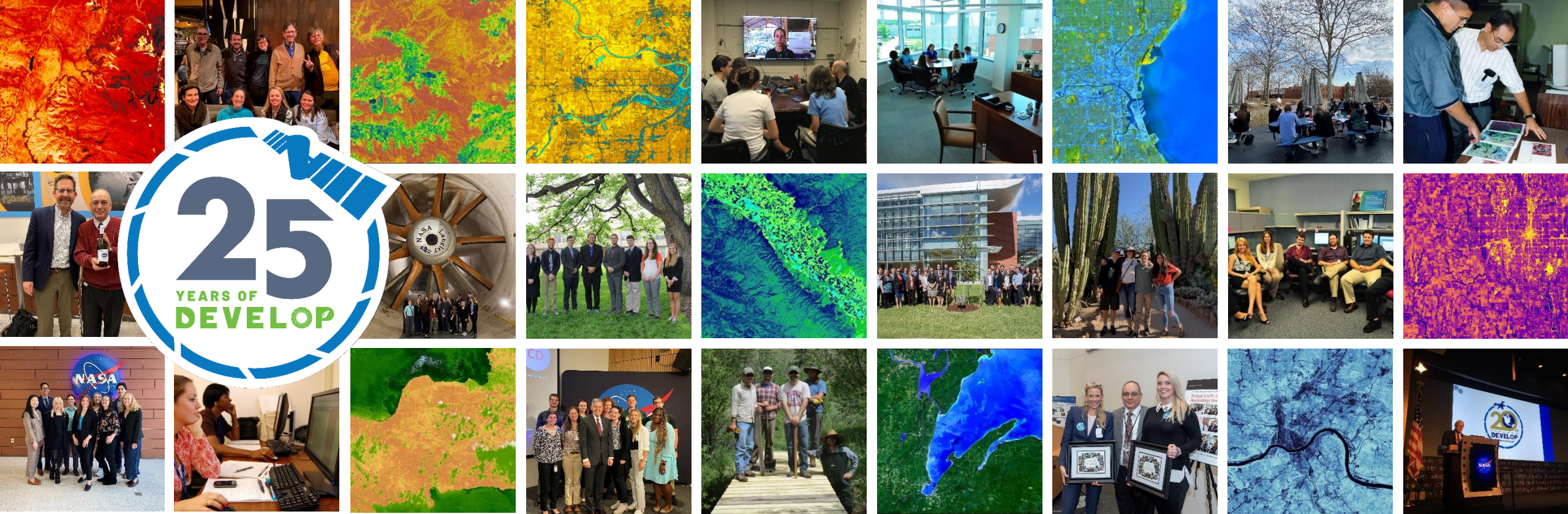




25 Years of the **NASA DEVELOP** Experiential Learning Model

Katie Caruso^{1,2} • Amanda Clayton^{1,2} • Lauren Childs-Gleason^{1,3} • Kent Ross^{1,3} • Karen Allsbrook^{1,3} • Stephanie Burke⁴

¹NASA DEVELOP National Program, ²Analytical Mechanics Associates, ³NASA Langley Research Center, ⁴Science Systems and Applications, Inc.

ED24A-07 | AGU Annual Meeting | Fall 2023



Mission:

Integrating NASA Earth observations with society to foster future innovation and cultivate the professionals of tomorrow by addressing diverse environmental issues today.



Geospatial
workforce
development



Explore capabilities of
Earth observations for
informing decision-
making



Conduct Earth
science application
feasibility studies in
10-week terms



Dual Capacity-Building

Mechanism to build skills and competency for
using Earth observations to inform decisions

Rapid Feasibility Studies



Participants



Partners





Project Characteristics

- Center on **environmental decision-makers'** priorities & decision-making process
- Assess the feasibility of **NASA Earth science** to inform decision-making
- Conducted in **10-week terms** by small interdisciplinary **teams**
- **Advised** by NASA scientists and partner organizations
- Hand off **end products** to partner organization
- Focus on at least one of nine thematic **application areas**
- Create a consistent set of **deliverables**

DISASTERS 

WILDFIRES 

AGRICULTURE 

ENERGY & INFRASTRUCTURE 

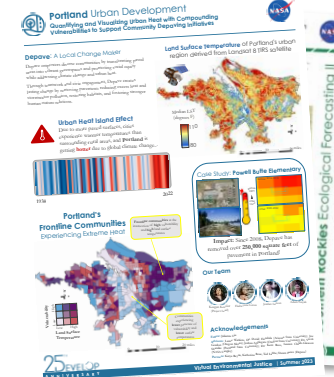
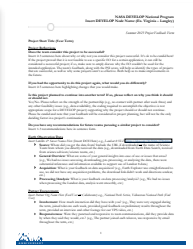
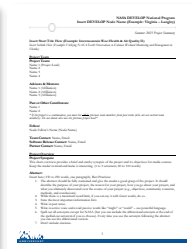
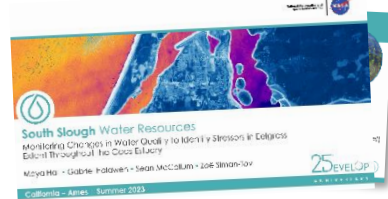
ECOLOGICAL FORECASTING 

WATER RESOURCES 

URBAN DEVELOPMENT 

CLIMATE 

HEALTH & AIR QUALITY 





Partner Engagement

Center Leads and advisors facilitate conversations with partners to identify interests, priorities, and understand decision-making process.



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Needs Assessment

Generate project idea (study area, thematic focus area, actionable decision, potential end-products). Proposal drafted and reviewed, and project scheduled.



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Project Creation & Iteration

Teams conduct literature review, build methodologies, and gather and interpret results. Advisors and partners regularly meet with the team to discuss progress and results.



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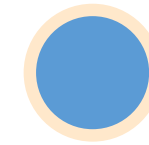
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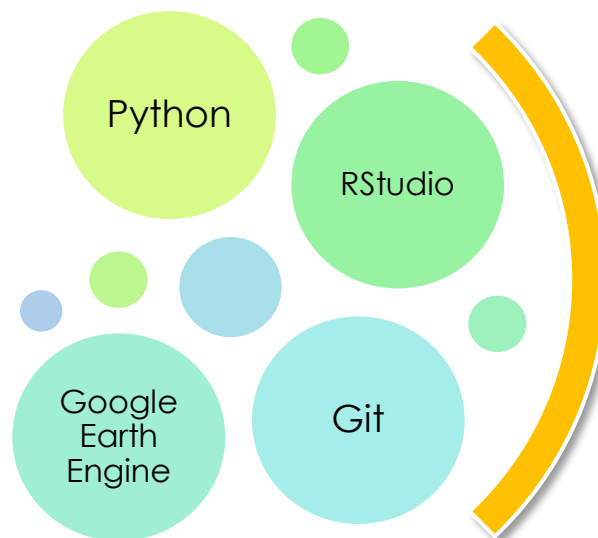
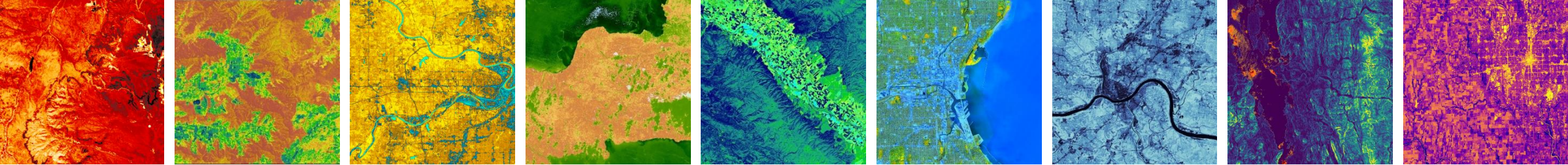
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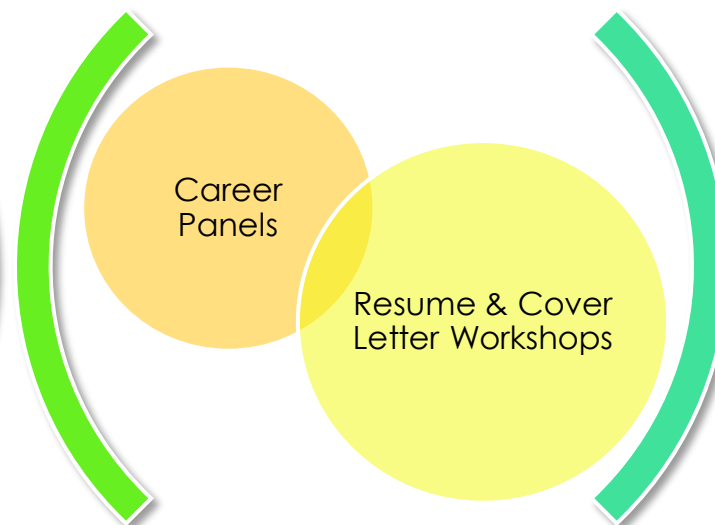


Communication & Tracking

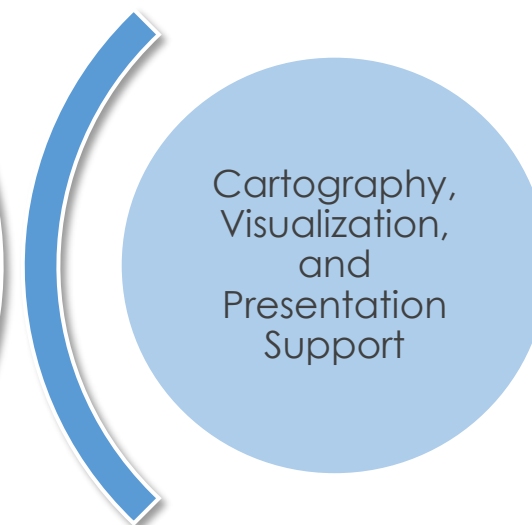
Teams host presentations and “handoff” project results, methodologies, deliverables, and lessons learned to partners. DEVELOP tracks project impact and gathers partner stories.



Software Carpentry



Professional Development



Science Communication

Assessing Climatology and Land Cover Trends and Evaluating Flood Risk of the Cheat River

Project Team: Sabine Nix, McKenna Brahler, Mary Everett Fuller, Alex Rowland; **Center Lead:** A. R. Williams

Partners: Friends of the Cheat; **Advisors:** Dr. Jeffrey Luvall, Dr. Robert Griffin



Identify long term trends in precipitation, temperature, and river discharge



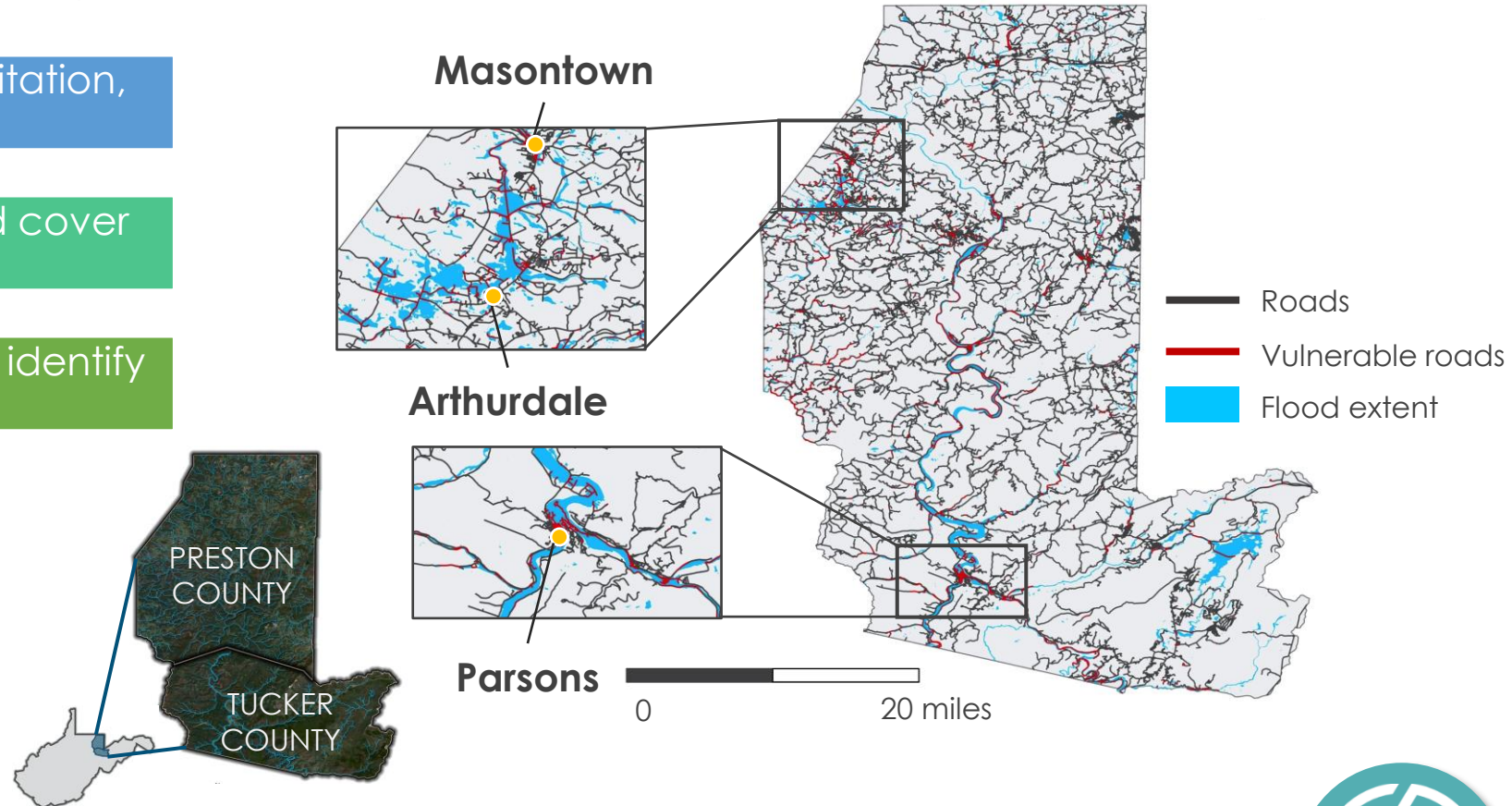
Quantify recent changes in land cover to better assess flood risk



Map flood risk and vulnerability to identify areas to target mitigation

[We] used the project's findings to support our public comments on the US Forest Service's Upper Cheat timber harvest project. The project...has led to the funding of projects that allow for aquatic organism passage...and reduce risk of failure of infrastructure.

– **Madison Ball** (Conservation Program Director)





- 10-week term
- Conduct projects
- Geospatial analysis
- Team building

Participant



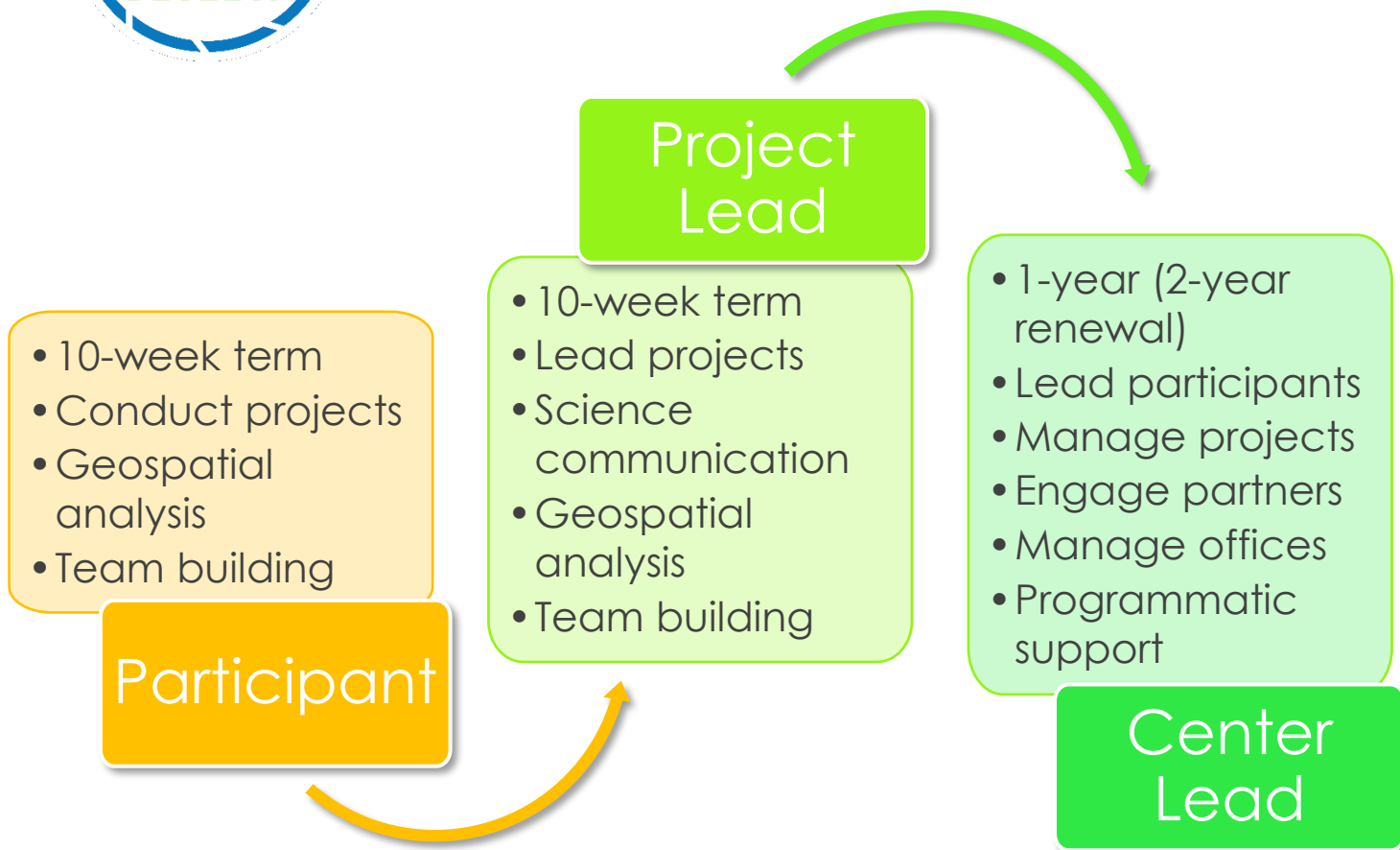
Project Lead

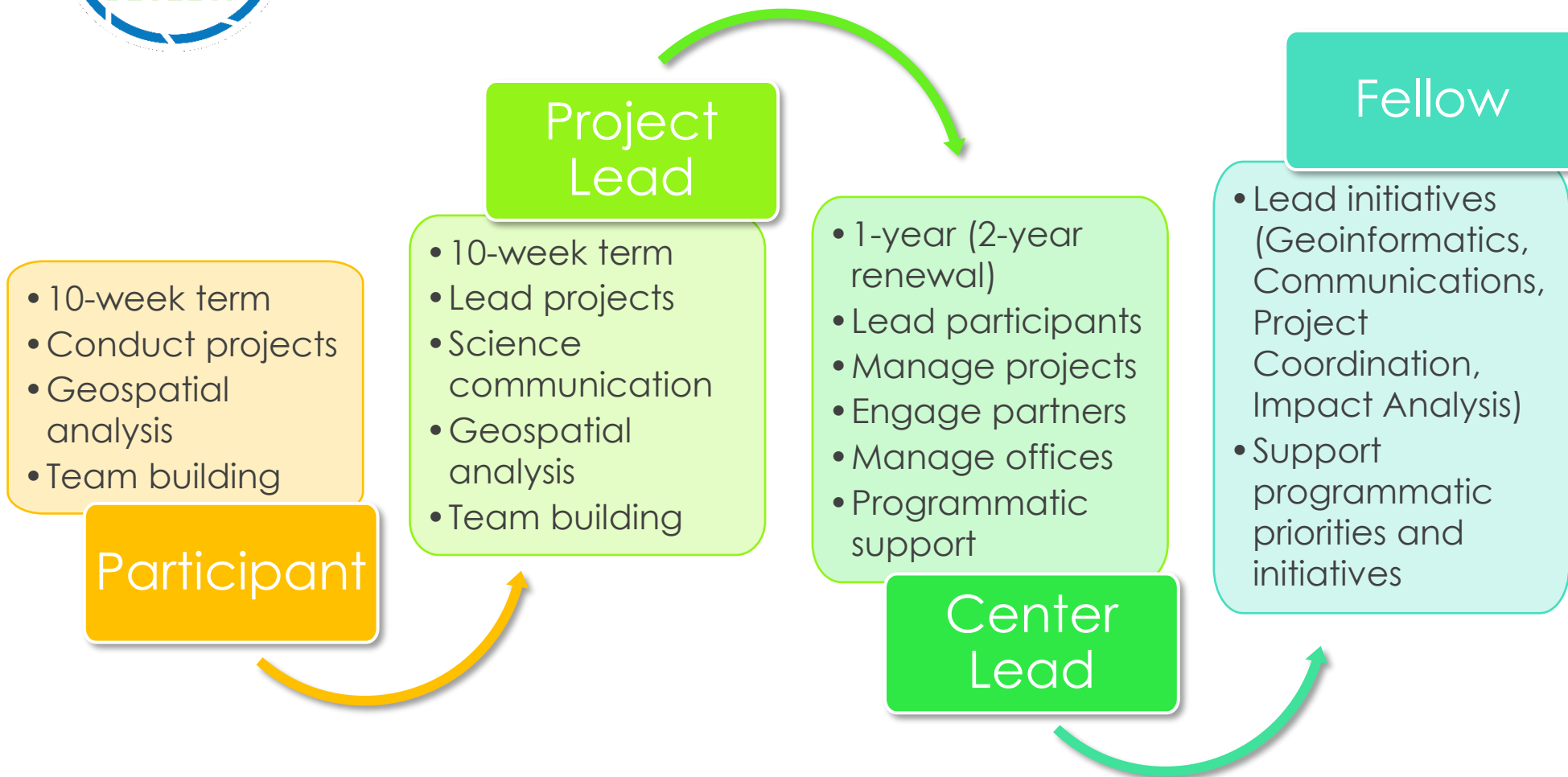
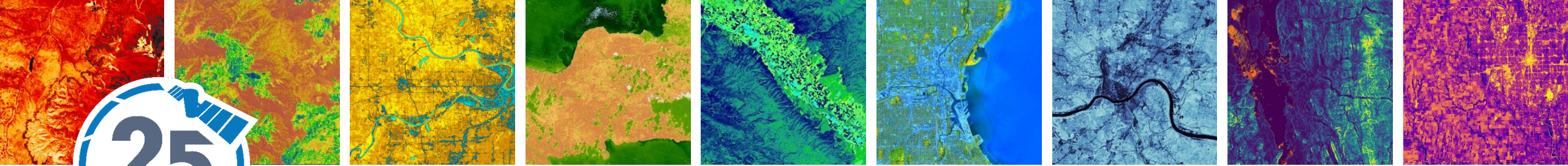
- 10-week term
- Lead projects
- Science communication
- Geospatial analysis
- Team building

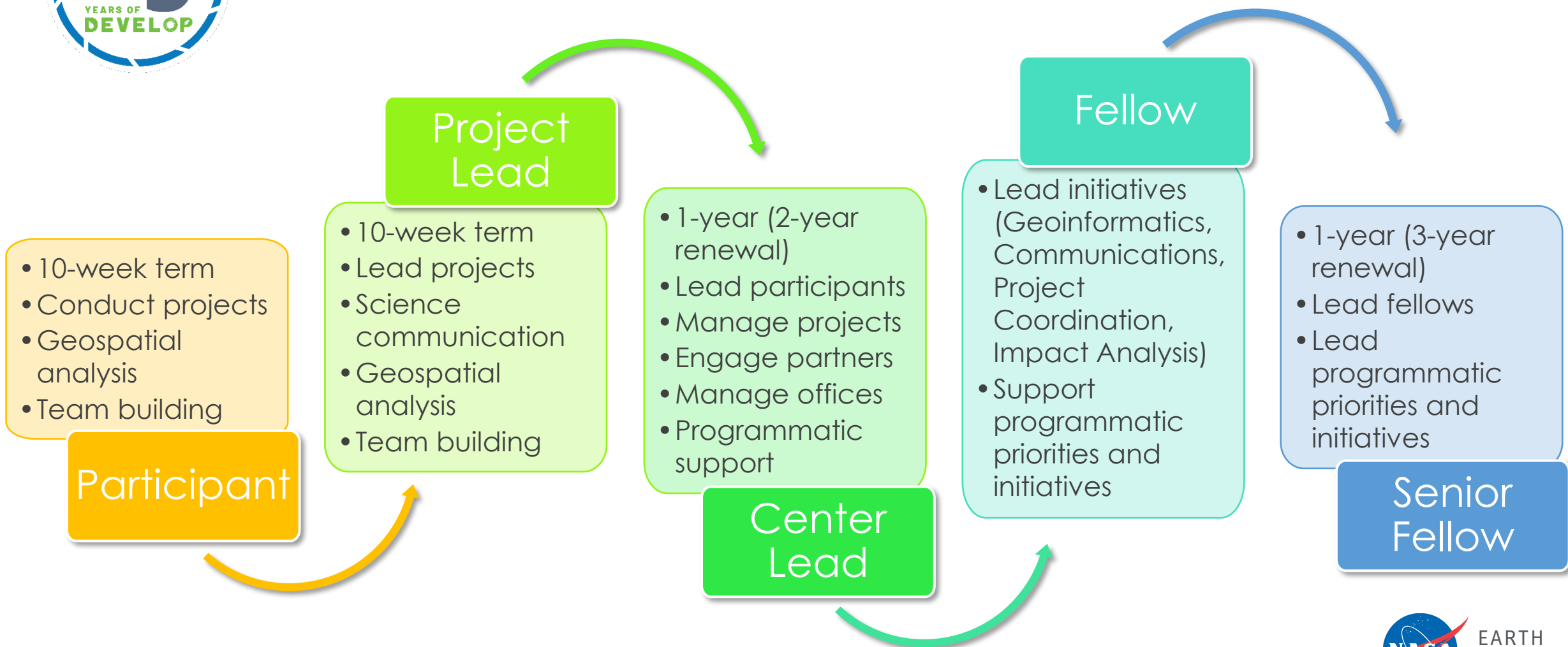
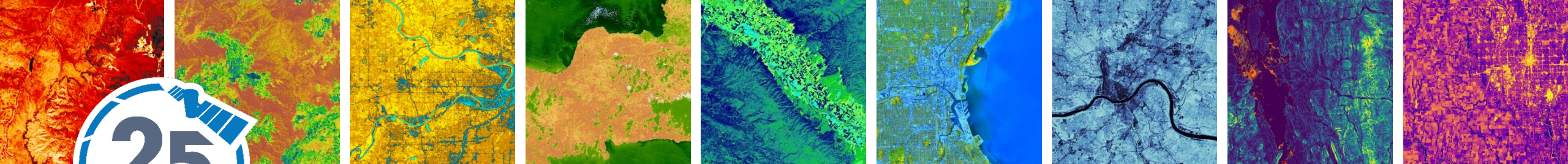
Participant

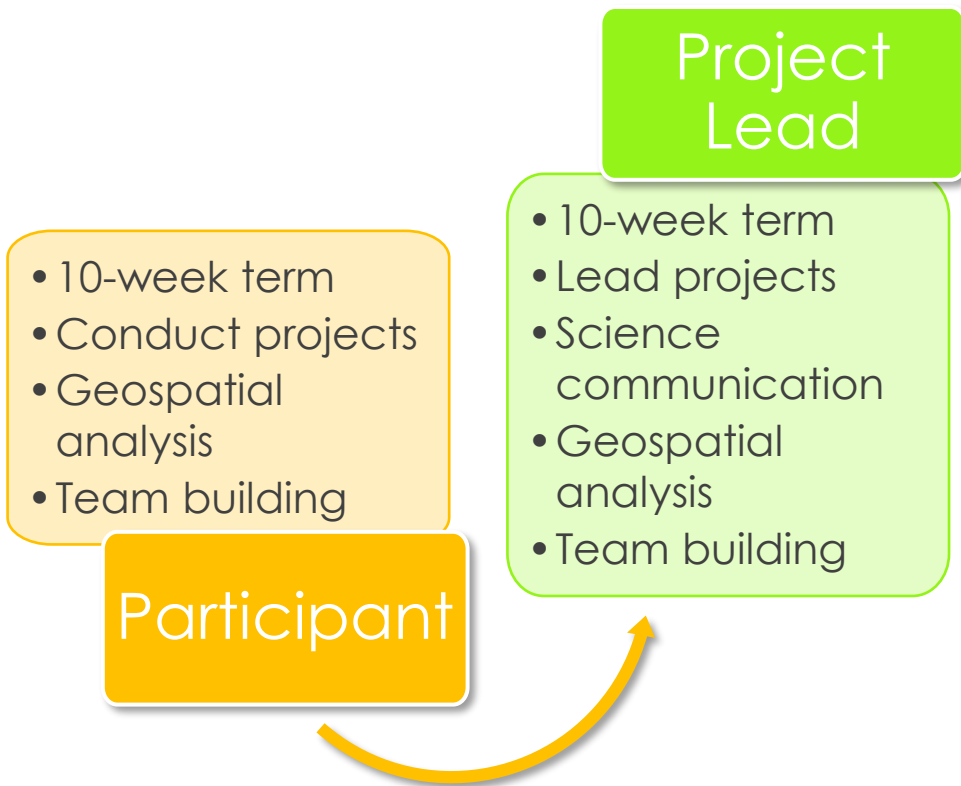
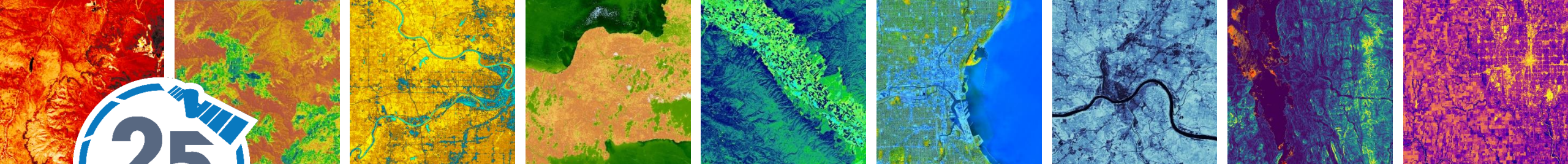
- 10-week term
- Conduct projects
- Geospatial analysis
- Team building



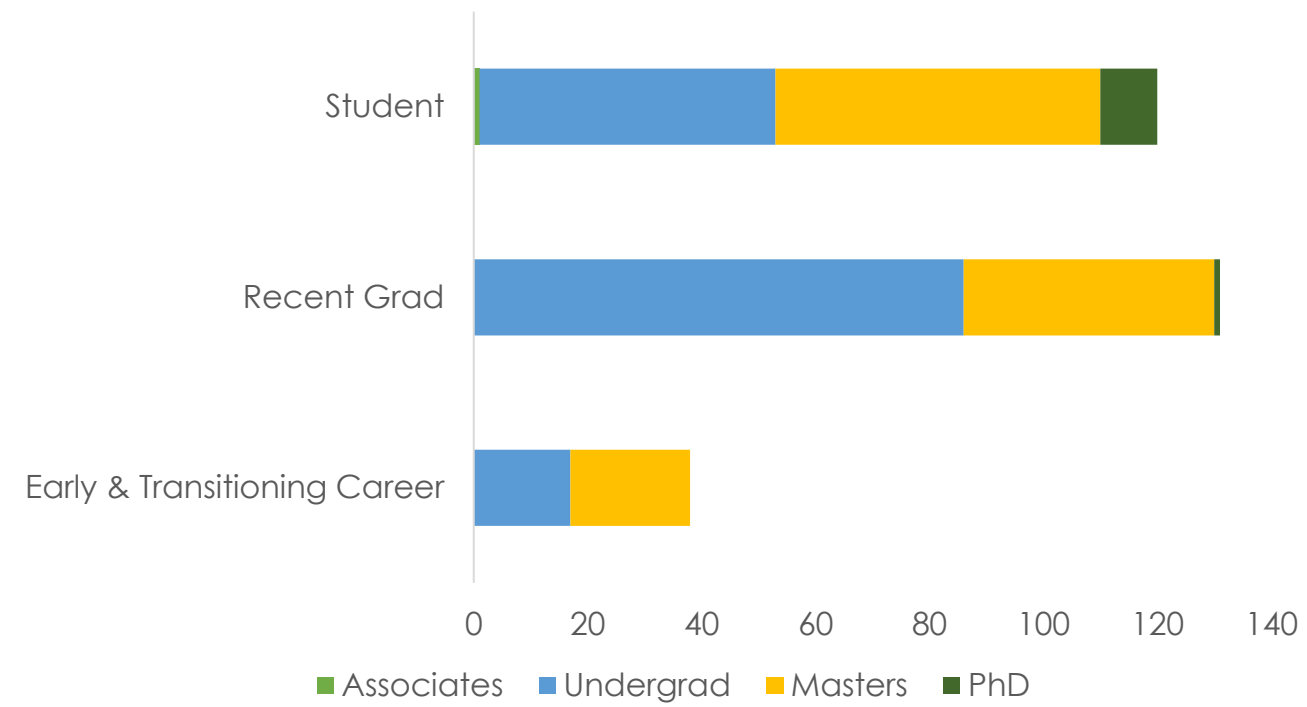








2022 Participant Population





DEVELOP's Reach



1,200

Feasibility Projects Conducted



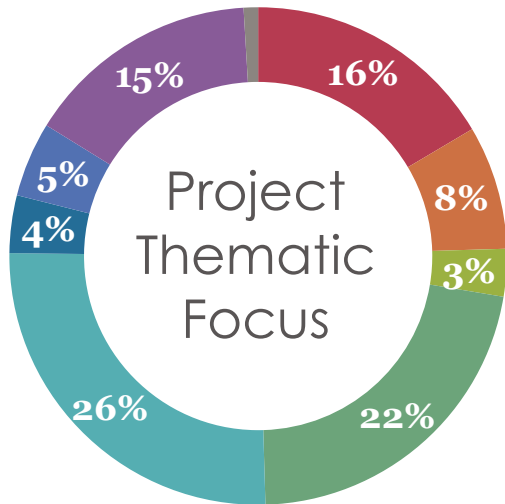
6,034

Capacity-Building Opportunities Provided



1,140

Unique Partner Organizations Engaged

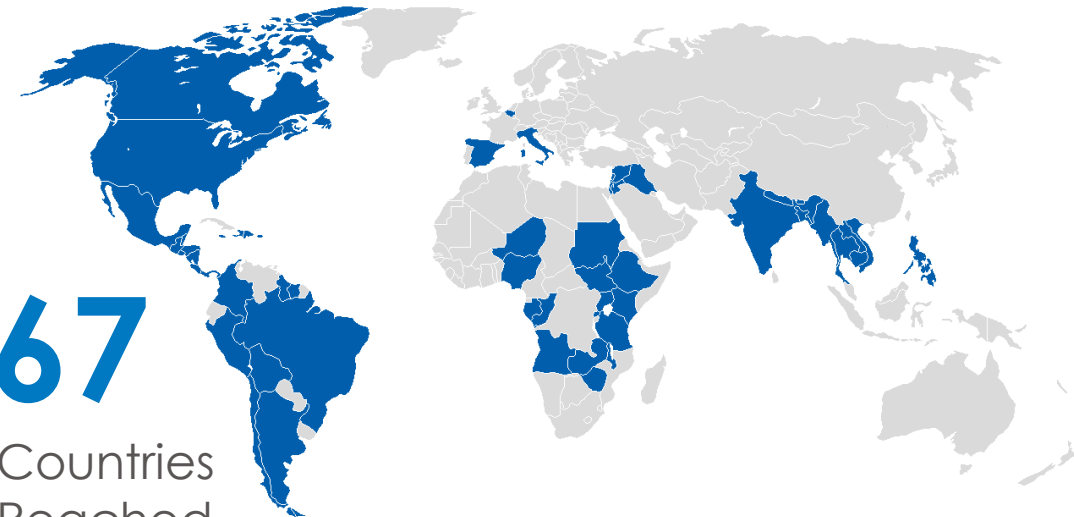


- DISASTERS 
- AGRICULTURE 
- ENERGY 
- ECO CONSERVATION 
- WATER RESOURCES 
- URBAN DEVELOPMENT 
- CLIMATE 
- HEALTH & AIR QUALITY 
- TRANSPORTATION & INFRASTRUCTURE 



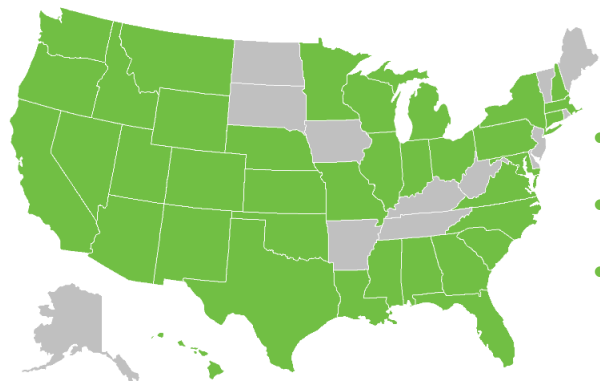
67

Countries Reached

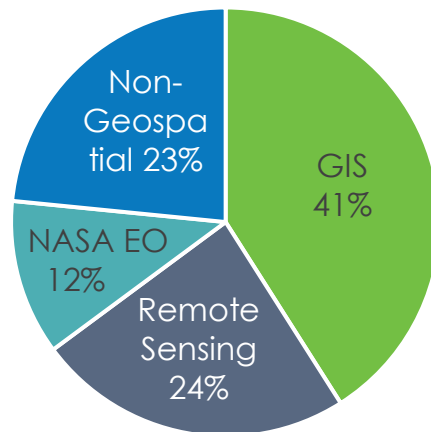




DEVELOP's Alumni



- Reside in 38 States
- 95% Employed
- 77% Work in GIS/RS



ALUMNI GAINED:

Network/Connections | Professional Experience
Technical Skills (RS/GIS/Coding/Data Analysis)
Project Management | Time Management
Teaming Skills | Leadership | Project Portfolio
Interview Experience | Resume | Confidence
Science Communication | Research Experience
Career Jumpstart | Work w/Partners | Publication
Authorship | Confirmation of Career Path



**GIANCARLO
DEMARCO**

Senior Risk Analyst
Ally Financial

“During my time at DEVELOP, the most valuable lesson I learned was how to problem solve and adapt. My time at DEVELOP also provided self discovery and career clarity.

Once I returned home, I enrolled in a graduate program to obtain my masters in applied statistics because I knew that I belong working in STEM.”



CARLOS CARILLO

Resource Specialist
Metropolitan Water District
of Southern California

“The fundamentals of hydrologic modeling and data management I learned during my time with DEVELOP provided me a good knowledge base, which has helped me grow in my career as a water planner. I am incredibly grateful to have had the opportunity as it kicked started my professional work career and opened so many doors that led to the fulfilling career I have today.”



AMANDA FORDHAM

Associate Director
Colorado State Forest Service,
Science & Data Division

“Skills I learned in supported research I completed during my PhD. Other skills I learned with supported the path to my current position where I provide strategic leadership, program oversight, coordination, and administration of applied science. From a professional standpoint, the most valuable thing I took away from DEVELOP was enhancing my skills in leadership.”

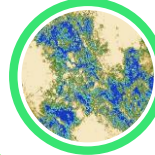
Working Environment

In-person and virtual projects offer different opportunities for participants and similar results for partners



Program Support

Teams need a strong support network, resources, and space to beta test, fail, learn, and try again



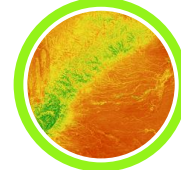
Needs Assessment

Assessing partners' interests and decision-making processes presents an opportunity to introduce new solutions



Applied Research

Partnering with end-users supports participants to apply problem solving to real-world questions through hands-on research



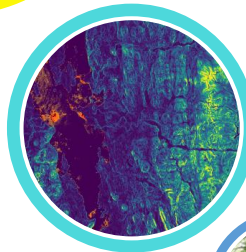
Leadership

Different roles (Participant, Project Lead, Center Lead, Fellow, Senior Fellow) can offer multiple pathways to practice leadership



Interdisciplinary Teamwork

Teams are most successful when members come from interdisciplinary backgrounds, career levels, experiences, and skill levels





Thank you!

Get Involved:



Email us at
NASA-DL-DEVELOP@MAIL.NASA.GOV

DEVELOP website
<https://appliedsciences.nasa.gov/nasadevelop>

 Tweet @NASA_DEVELOP or #NASADEVELOP
https://twitter.com/NASA_DEVELOP

 DEVELOP National Program
www.facebook.com/developnationalprogram