Developing Soft Skill in the Geosciences: NASA DEVELOP's Approach to Strengthening Soft Skills in the Future Geospatial Workforce

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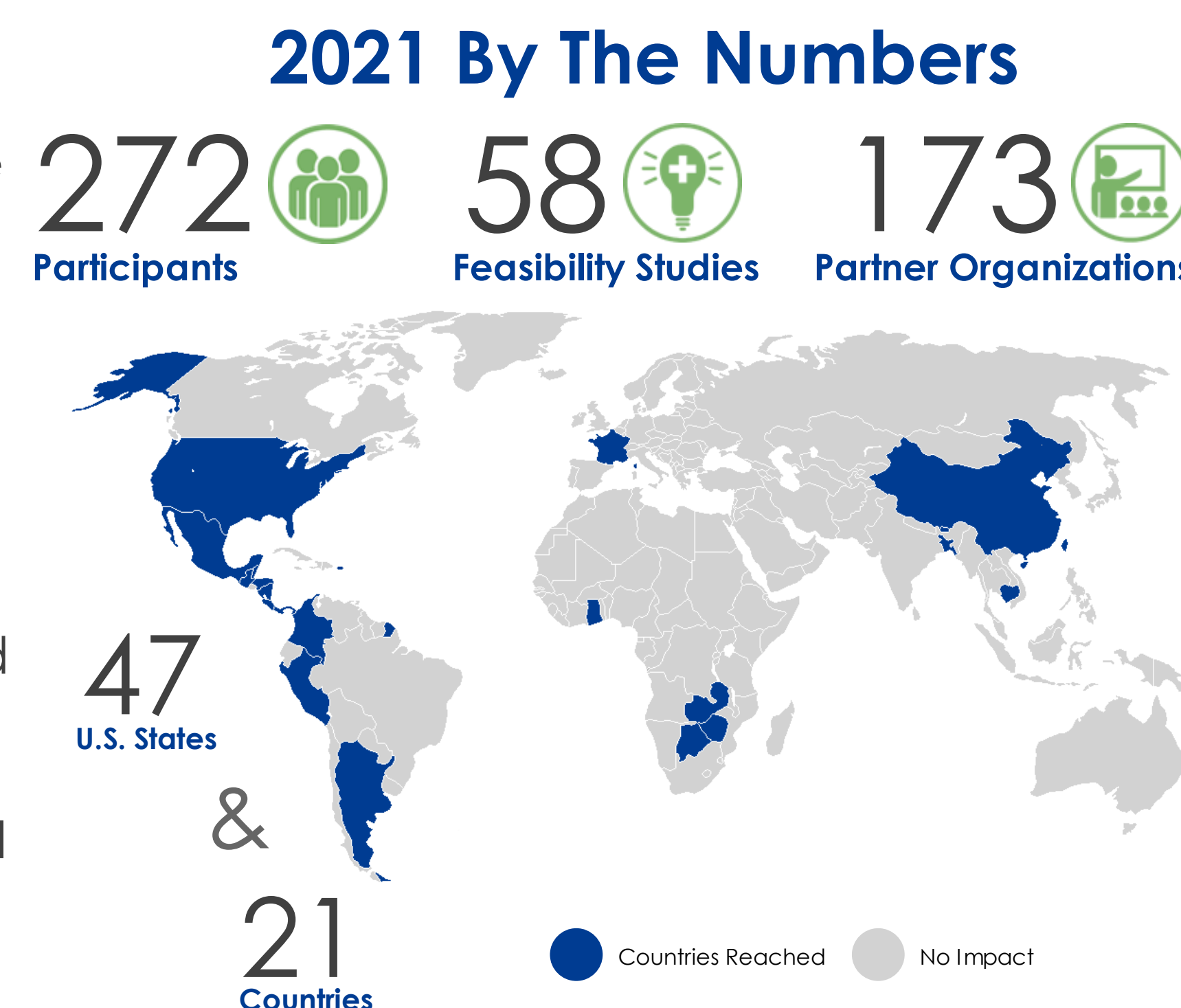
ABSTRACT

Part of NASA's Applied Sciences, the DEVELOP Program bridges the gap between NASA Earth Science and potential users through rapid feasibility studies that apply Earth observations to environmental decision making needs. The program conducts 50-60 studies a year that engage participants – students, recent graduates, early career individuals, and transitioning career professionals – in autonomous teamwork with an emphasis on professional development and communication. The experience offers participants a robust opportunity to build their teaming skills (facilitated through programmatic personality assessments and discussions), interpersonal communication, and critical thinking skills which are central to project work in the DEVELOP model. The program also offers leadership opportunities where participants lead their peers within a supportive environment. This presentation will introduce the DEVELOP model for soft skill development, lessons learned, and highlight testimonials of past participants.
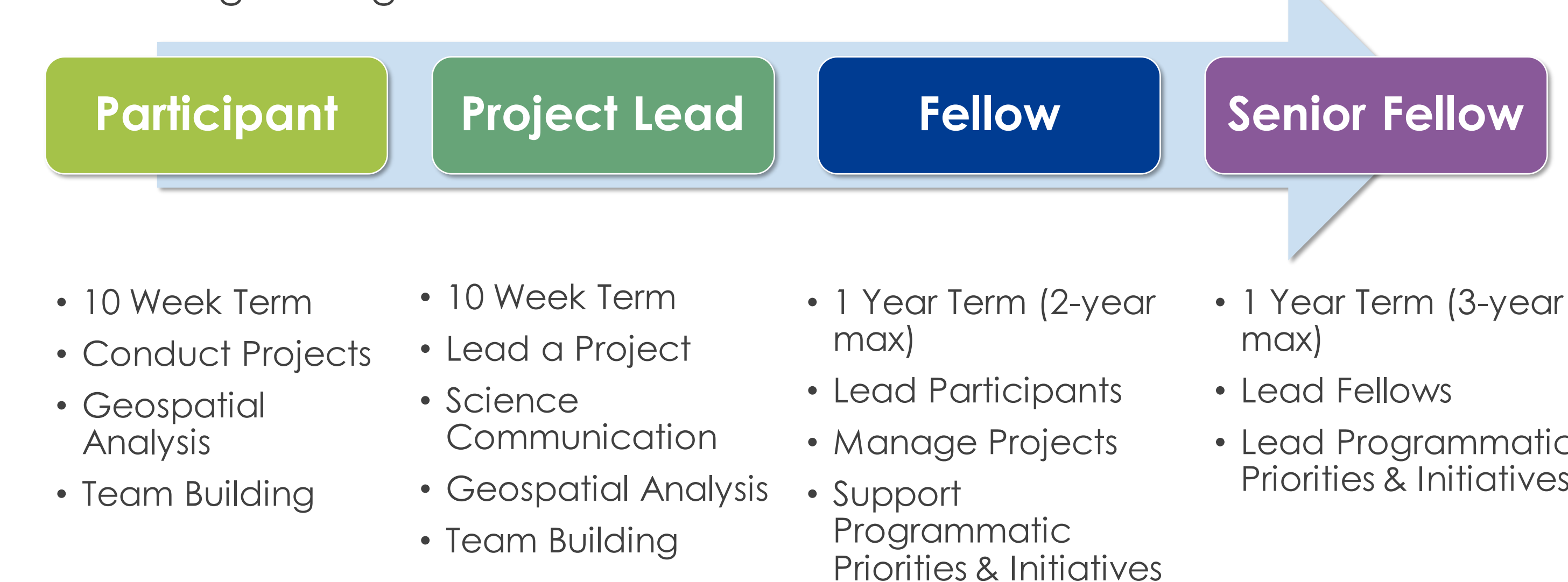
THE DEVELOP MODEL

DEVELOP is a dual capacity building program that focuses on workforce development. A large part of the DEVELOP experience is the professional development of participants to empower and prepare them for their future careers. Through rapid 10-week project terms, participants face the challenge of taking a project from start to finish. The experience offers participants a robust opportunity to build not only their technical but "soft" skills such as teamwork, time management, professionalism, communication, networking, and leadership. Through a pipeline of opportunities that provide enhanced roles and responsibilities, leadership skills are built in a supportive environment.

- Participants placed on small teams w/Project Lead to organize themselves
- DEVELOP orientation sets clear expectations & project timeline and milestones
- Personality assessments provide shared language for rapid teaming
- Supportive learning environment w/Advisors, Mentors & programmatic structure
- Regular interactions with partner organizations drive professionalism & communication
- Weekly challenges: learning new information, tools, processes, etc.
- Culminating in science communication, presentations, and sharing results

INTRODUCTION TO NASA DEVELOP

DEVELOP conducts rapid feasibility studies that engage participants and partner organizations in a collaborative learning environment that emphasizes workforce development and innovative uses of Earth observations.

Hosted at 11 "nodes" in the U.S., DEVELOP conducts 10-week projects in the spring, summer, and fall each year. These projects build both technical and soft skills in participants while demonstrating how Earth observations can be used for decision making in real world situations.

2021 By The Numbers

272 Participants
58 Feasibility Studies
173 Partner Organizations

47 U.S. States
&
21 Countries

Countries Reached — No Impact

DEVELOP's Opportunity Pipeline

DEVELOP offers a pipeline of increasing responsibility for those interested in continuing to build their skillsets. Each opportunity builds off the skills and expertise gained in earlier positions and builds leadership, a professional network, and strong managerial skills.

Participant → Project Lead → Fellow → Senior Fellow

Participant	Project Lead	Fellow	Senior Fellow
• 10 Week Term • Conduct Projects • Geospatial Analysis • Team Building	• 10 Week Term • Lead a Project • Science Communication • Geospatial Analysis • Team Building	• 1 Year Term (2-year max) • Lead Participants • Manage Projects • Support Programmatic Priorities & Initiatives	• 1 Year Term (3-year max) • Lead Fellows • Lead Programmatic Priorities & Initiatives

Tuckman's Model of Phases of Team Development

Forming → Storming → Norming → Performing → Adjourning

DEVELOP project teams have just 10 weeks to work through the phases of team development. To foster rapid forming, storming, norming, and performing, the program employs multiple tools:
- personality assessments to provide shared language and increase understanding of each other and themselves
- Robust programmatic structure of support
- Well-tuned 10-week calendar of deadlines and milestones
- Professional development opportunities to engage and get to know team members better

TEAMWORK

Central to the DEVELOP model is the project team. The 10-week term offers an opportunity for participants to engage with others, learn how to work effectively with others on shared deliverables, and explore professional interactions.

"I liked that the atmosphere encouraged growth and learning and that my teammates could all work well together and learn from each other."

"This term I learned how to better work on a team and how to lead a team. It was an excellent experience and I learned a lot about myself."

"I liked the collaborative aspect of the team because I felt like I was able to learn more from all of my teammates as well as just from the work I was doing."

"The teamwork environment of DEVELOP was great for helping us gain experience working with teams as a whole."

LEADERSHIP

"I enjoyed the additional challenges that came with being a Project Lead. Watching our team chemistry develop and grow with the project was a big highlight."

"Having the opportunity to gain leadership and project management experience was amazing."

There are opportunities to build leadership skills at every level of DEVELOP engagement, from Participant to Senior Fellow. Exploring how to effectively lead peers is key for project teams, Fellows, and Senior Fellows.

Project Leads are given a specialized orientation that helps establish leadership norms and expectations, manage a project from beginning to end, and cope with challenges that may arise. Fellows and Senior Fellows receive an even more in-depth orientation and receive feedback throughout their year term to better shape and strengthen their leadership skills.

TIME MANAGEMENT

The DEVELOP project structure provides a foundation for project teams to collectively work from the beginning to the end of a project in just 10 weeks. For those who have not experienced group work or similar projects, this model is one that can be replicated in future project endeavors and has been used by DEVELOP alumni at school and jobs.

The 10-week term is segmented into weekly milestones with different deliverables due along the way. The deliverables build off each other so that the project team ends with a set of cohesive products to share with partners. Project teams also work with each other to assign tasks, review progress, and assess modifications to the work plan as needed.

"Deliverable deadlines kept us on track."

"My highlights were the project workflow, time management, and resources provided."

COMMUNICATION

Communication is a critical component of DEVELOP project teams, DEVELOP's engagement with partner organizations, the program's distributed node model, general professional development, and the communication of project results and methods. Professional communication is discussed in orientation and then implemented through experiential learning.

The program puts an emphasis on science communication through the creation of a series of deliverables aimed at helping share results and methods with partners and the general public. Best practices are learned as participants create the deliverables and are challenged to present their work in multiple forums.

"I liked how DEVELOP not only challenged me to expand my technical skills, but also pushed me in my leadership and scientific communication skills."

"DEVELOP cultivated the skills I was looking to grow in: professional development, scientific communication, and coding."

NETWORKING

Networking is one of the most sought after opportunities within DEVELOP participants and the program supports this interest through multi-tiered networking opportunities:
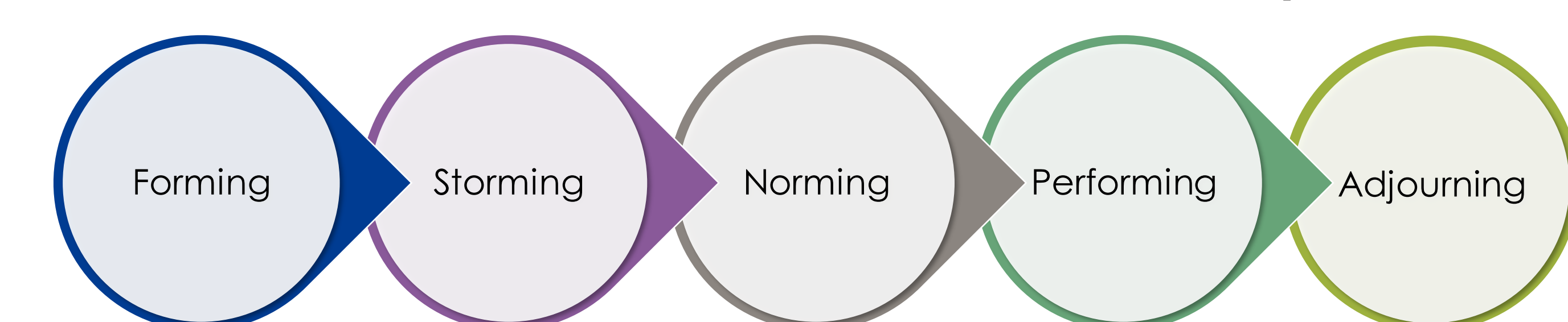- Networking with peers on project teams and at other nodes
- With partner organizations and guest speakers
- With NASA scientists, DEVELOP managers, and NASA Applied Sciences leadership
- At conferences, meetings, and public events

"I loved all the networking opportunities."

"I enjoyed all the guest speakers and networking opportunities! I also enjoyed the node buddy tag-ups! It was nice to meet and get to know people from other nodes."

"I found the networking opportunities encouraging and wasn't afraid to ask questions and reach out to people to hear more about their experiences."

PROFESSIONALISM

DEVELOP's signature is professionalism in all aspects – scientific integrity and quality research, professional and respectful communication and interactions with partners, competent and mindful team communications, organized and orderly project materials, and reliable and timely deliverables and products.

"I loved working with other young professionals with similar goals and excellent skills. It was wonderful to feel challenged and encouraged by my peers."

"DEVELOP challenged me to grow and improve myself. The DEVELOP experience widened my skillset and improved my teamwork, project management, and professional skills."

"I really enjoyed professional development week, getting to know other nodes through cross-node activities, and our chats with our lead science advisor."

NASA DEVELOP Program