DEVELOP Orientation

Module 2. The Ins & Outs of Projects & Partnering at DEVELOP

EARTH ACTION

Feasibility Project Characteristics

50+ feasibility projects take place each year – at their core they share these characteristics:

- Highlight the applications and assess capabilities of **NASA Earth observations**
- Address **environmental management concerns** relating to decision-making for real-world issues
- Partner with “end user” organizations who can benefit from using **NASA Earth observations** to enhance decision making by **providing decision support products**
- Align with at least one of the DEVELOP’s 10 **Thematic Application Areas**
- Create a consistent set of **deliverables** to **communicate the science**
- Conducted by teams with diverse backgrounds under the **scientific guidance of Science Advisors and mentors from NASA and partner organizations**

Project Lifecycle

By The Way

Ideas can come from anywhere as long as they connect to a decision-making end user! Have an idea? Tell your Lead!

- All DEVELOP projects center around a **decision**.
- DEVELOP connects with potential partners through: project request forms submitted through the website, boundary organizations, past partners, DEVELOP alumni, science advisors & their networks, conferences, NASA HQ (ex. Program Managers and their teams), NASA Center reps, CEOS & GEO, and beyond!
- DEVELOP identifies the information that would be helpful to the partner when making this decision. This is the partner's need aka the "community concern".
- Project end products are designed to fit into the partner's decision-making process.
- The end deliverable package is handed off for partners to explore further and assess integration into their decision-making process.

Scientific Integrity

"The iconic success of NASA is planted firmly on three foundational elements: **innovation**, **inspiration**, and **integrity**. While innovation and inspiration are visible through our endeavors and successes, it is our integrity – **how we work**, and **our commitment to excellence and openness** – that **earns us the trust** of the public and ensures our continued ability to inspire and innovate. **Integrity is woven throughout the fabric of NASA**. It has always been there. And each and every day, we recommit ourselves to keeping it there."

Dr. Waleed Abdalati
Former NASA
Chief Scientist

NASA SI Policy: http://www.nasa.gov/pdf/611201main_NASA_SI_Policy_12_15_11.pdf

Reproducibility & Replicability

As DEVELOP projects set out to assess the feasibility of applying EO to address a variety of environmental challenges, the ability to reproduce or replicate results and methods is central to the success of partners and future DEVELOP teams.

Here are some foundational tips to support the adoption of your project:

- **Good data management**: "Data management is the development, execution and supervision of plans, policies, programs and practices that control, protect, deliver and enhance the value of data and information assets." Answers the questions: 1) Where did the original data come from? 2) What was done to the data? 3) Can I find the data again if needed?
- **Strong organization**: Organize your team's data using a directory structure, segregate materials for a project into one directory with folders (data, methods, results, deliverables), keep raw data separate from processed data, include README files, have your README files describe the contents of a folder, list the files in that folder, and provide metadata.
- **File nomenclature matters**: File names should be… 1) Machine Readable (do not include special characters (%, $, &, etc.), use underscores instead of spaces), and 2) Human Readable (file names should briefly, but adequately, describe the contents of the file, use versions as needed), and 3) Work well with default ordering (i.e., name the files so that they default in chronological order)
- **Document everything**: Document your decisions - why did you choose your methods? Keep a list of all equations or formulas. Keep track of both failures and successes. Document exact steps of final methods.

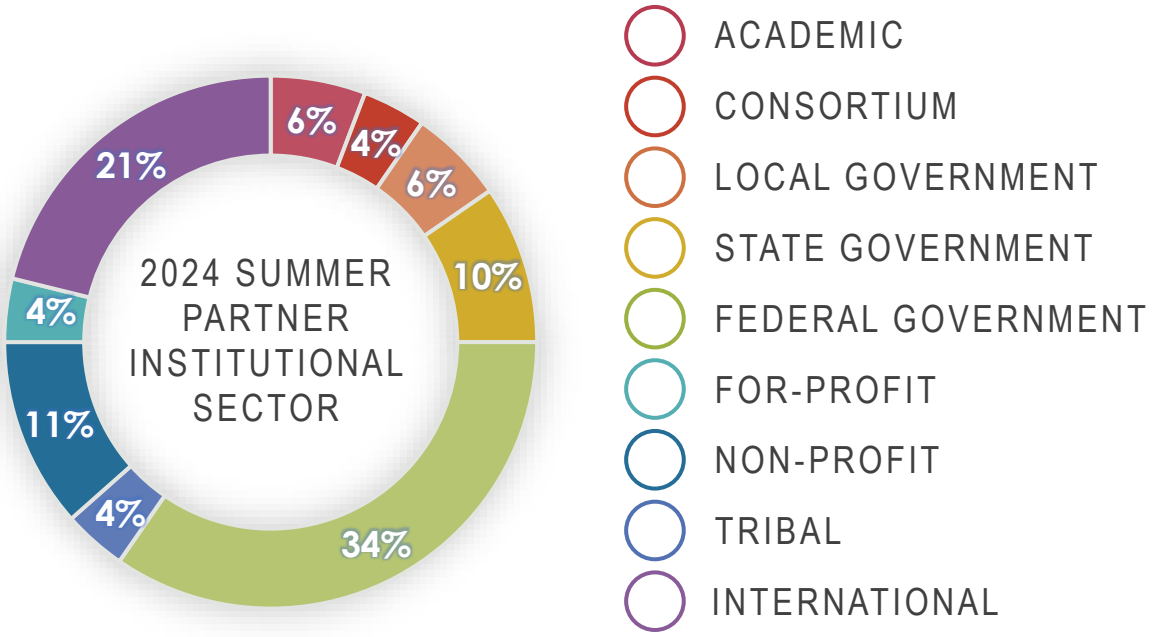
DEVELOP Partners

Any organization can partner with DEVELOP. “Partner” is the umbrella term for any outside organization DEVELOP engages with through projects, nodes, or other activities. Each feasibility project tailors to a specific end user that is making an environmental decision.

Partner Types

- **End User:** Organization that receives results and methodologies from DEVELOP (either directly from a DEVELOP project team or through a collaborator/boundary organization) and can use the project’s products or methodologies to make a decision or policy or take action; they may also provide some kind of resources (advising, data, model, software, funding, etc.), but it is not required.
- **Collaborator:** Organization or individual that works directly with a DEVELOP project team and provides some kind of leveraged resource (advising, data, model, software, funding, etc.), but are not actually using the project’s products or methodologies to make a decision or policy.

Partner Sectors



Partner Engagement & Communication Plan

A cornerstone of DEVELOP projects is the engagement of organizations who can benefit from the integration of NASA Earth observations in their decision-making processes. All DEVELOP feasibility projects engage at least one end user organization to hand off project results and methodologies to.

Communication Plan:

- **Team-partner meet & greet in week 1 or 2** – purpose: introductions and foundation setting for the team to understand the partner's work, priorities, environmental challenge at hand, and interests
- **Weekly or Bi-Weekly Partner Meetings** – purpose: team share status updates, share preliminary results, gain partners insights and "quality checks" on maps, etc.
- **Hand-off event at the end of the term** – purpose: package up and inform the partners of the team's final results, feasibility assessment of using EO to address their environmental concerns, share insights on methodologies, answer questions the partner may have, etc.

Checklist: Working with Partners

- ✓ Ensure professionalism in all interactions - you are representing yourself, your team, your advisors, your node, DEVELOP, Earth Action, and NASA!
- ✓ Have a plan and schedule. Sharing an agenda and questions ahead of partner meetings is helpful.
- ✓ Be realistic in what you promise and the expectations of the partner. In fact, don't "promise" anything, but ensure the plan you are working towards is clear and that there is a healthy understanding of challenges and potential obstacles/risks.
- ✓ Keep in mind the limitations of resolution (spatial and temporal) of NASA data and work within them.
- ✓ Understand the partner's needs and interests and let that help guide the team's work.
- ✓ Keep communication lines open and ensure the team follows through. Generally speaking, the Project Lead should be the POC for communicating with a partner unless it is specifically delegated to another team member.
- ✓ Make sure to CC your lead on emails between the team and any partners to keep them in the loop!
- ✓ Include your project's Science Advisor in partner communication as much as is possible, per your advisor's availability.

First Partner Meeting Prep

- Review the proposal/work plan and any other supporting documentation as exists (project request forms, email correspondence, etc.)
- Review the partner's website and learn about their organization
- Brief lit review on the environmental challenge at hand
- As a team, prepare a list of questions you'd like to ask the partners – anything not covered or addressed in the work plan, insights relating to their decision-making process, the environmental challenge at hand, etc.
    - We've read the proposal, but can you talk us through the issue at hand and your decision-making process?
    - Does your organization currently use GIS or any spatial analysis?
    - What software programs do you typically use?
    - What types of data formats do you typically work with?
    - What are your expectations of our project?
    - What format should end products be in to be useful?

International Projects

By The Way

DEVELOP projects often include international participants who may have contacts in a foreign country where the study area lies. Be mindful that any communication with others outside the US relating to the project is pre-approved by your Lead and NPO.

- DEVELOP can and does work internationally. The program has a domestic focus with metrics to reach 35 states a year and all 50 states on a rolling three-year basis. Ensuring these domestic metrics are met, the program can pursue international projects.
- When working with international partners, care must be taken that appropriate approvals and communication lines are followed due to complexities relating to export control, federal regulations, and designated country classifications.
- **What is a 'Designated Country'?** NASA maintains a list of "Designated Countries," countries with which the U.S. has no diplomatic relations, determined by Department of State to support terrorism, are under Sanction or Embargo by the U.S., and/or countries of Missile Technology Concern.
    - www.nasa.gov/sites/default/files/atoms/files/designated_country_list_6.10.2022.pdf
    - Any engagement with individuals or organizations in these countries is NOT allowed unless specifically approved by NASA's Office of International and Interagency Relations (OIIR), for example the NASA engagement with Bhutan.
- OIIR supports DEVELOP when interacting with international organizations and must be included and aware of all international engagement. NPO coordinates with and involves OIIR reps.

2025 Spring Portfolio

ENGAGEMENT:

113 PARTICIPANTS

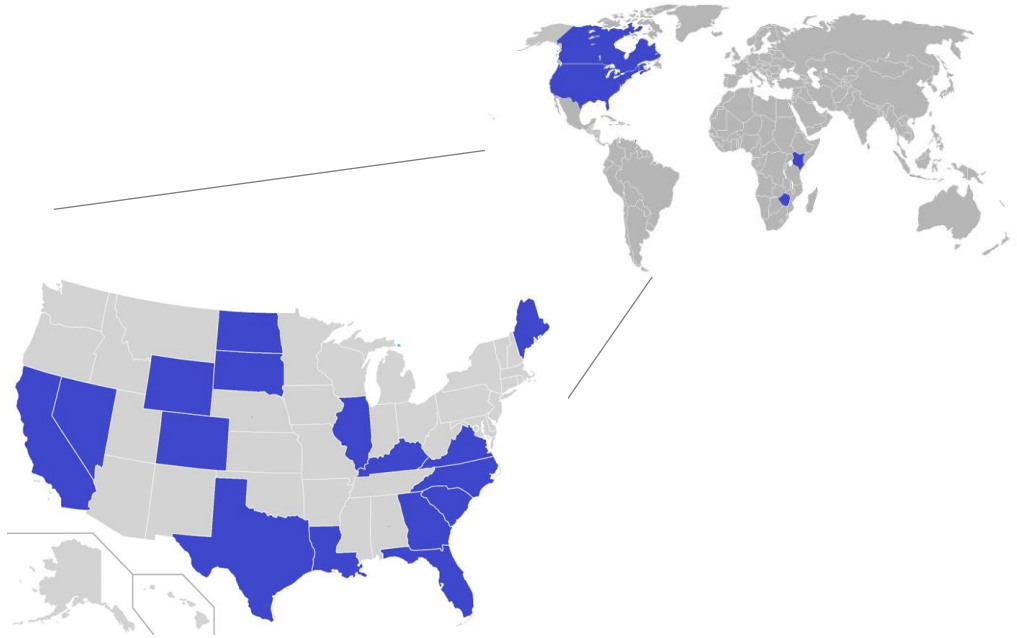
55+ PARTNER ORGS

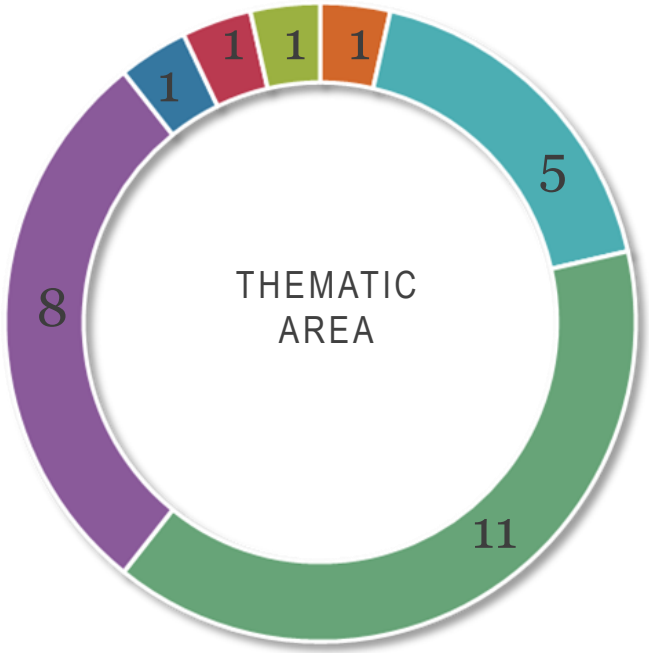
28 PROJECTS

IMPACT:

16 U.S. STATES

5 COUNTRIES





- Agriculture
- Water Resources
- Ecological Conservation
- Health and Air Quality
- Disasters
- Climate
- Wildland Fires

Texas & Georgia Agriculture
Coastal Florida Eco Conservation
Flat Tops Eco Conservation
Garissa County Eco Conservation
South Dakota Eco Conservation
Zambezi Eco Conservation
Southern Indiana Eco Conservation II
Nothern Rockies Eco Conservation II
Sonoran Desert Eco Conservation
Amargosa Eco Conservation
Puerto Rico Eco Conservation
Gulf Coast Eco Conservation
San Bernadino Wildland Fires
Trinada and Tobago Climate

Farjardo River Water Resources
Western United States Water Resources
Coastal Southern Carolina Water Resources
Great Slave Lake Water Resources
Upper Missouri River Basin Water Resources
Kentucky Disasters
Hampton Roads Health & Air Quality III
Davidson Health & Air Quality
Boynton Beach Health & Air Quality
Southeast Los Angeles Health & Air Quality
Clarksville Health & Air Quality
Harrisonburg Health & Air Quality
Portland Health & Air Quality
Chatham County Health & Air Quality

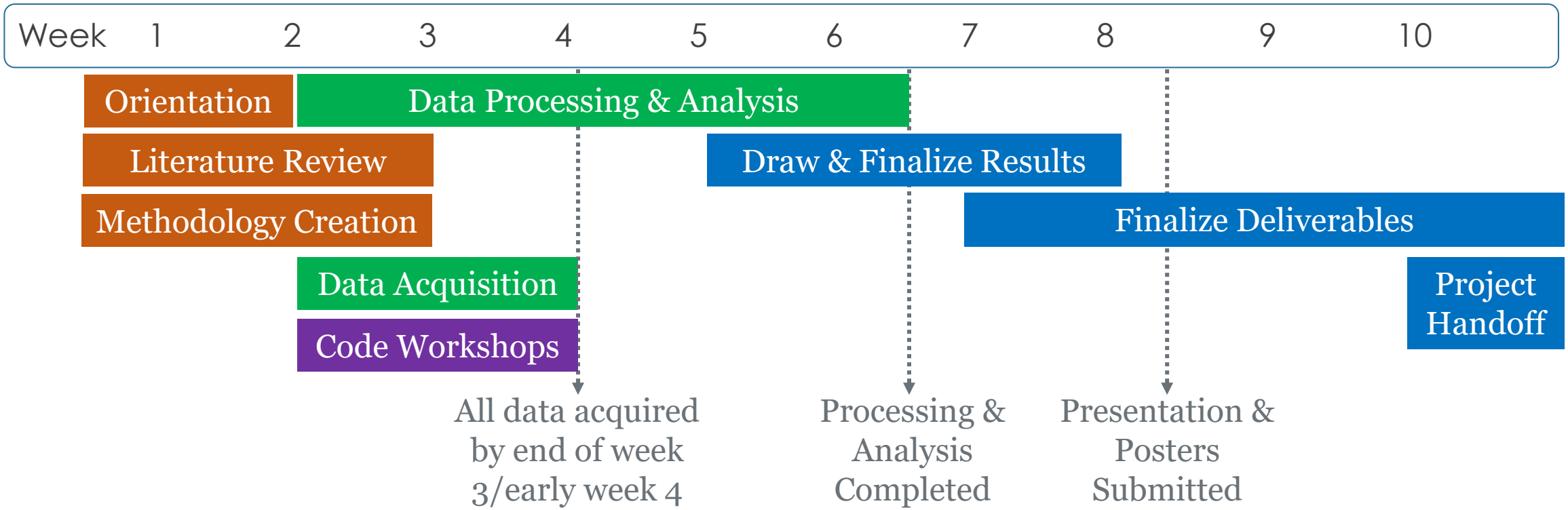
Feasibility Project Considerations

- DEVELOP projects are 10-week feasibility studies – we do these projects to see if the methods work! In 10 weeks, validation efforts are limited at best.
- Be mindful in how you communicate with partners – do not overpromise or oversell your products and results.
- NASA does not develop or prescribe policy, thus DEVELOP projects do not either – they simply demonstrate the feasibility of integrating NASA Earth observations into decision-making processes.
- Other agencies and organizations may use the data and scientific results in their policy analysis and development.
- NASA funds DEVELOP, thus DEVELOP projects are focused on the application of freely-available NASA Earth observations.
- The North Carolina node receives NOAA funds, so they have an additional directive to highlight NOAA CDRs.
- An increasing number of projects are using commercial datasets, these are generally only included in the proposal when a partner would have access to the data to replicate on their own in the future OR if a one-time static product is created by the team. NASA data must be involved meaningfully in the projects.

10-Week Timeline

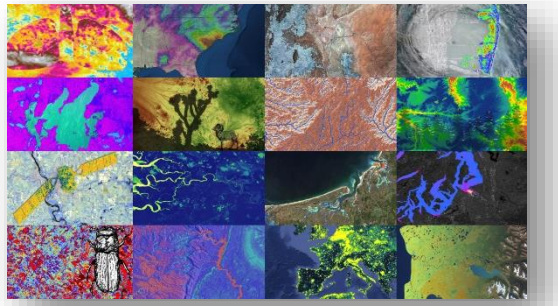
Although your project will last 10 weeks, note that only a subset of that is used for conducting analysis. Communicating the results is just as, if not more, important to working with partners effectively.

General schedule to compare progress against…



Supporting Project Teams' Data Acquisition & Coding: Workshops (Week 2, 3, & 4)

- DEVELOP offers multiple workshops aimed at data acquisition, processing, and analysis workflows that participants are encouraged to attend if they would like to improve their technical skills! These are introductory and (mostly) optional!
- Participants sign up for a subset of the following workshops:
    1. **DAAC Meetings –** covers the available resources for acquiring data via the Distributed Active Archive Centers. Good for participants who are unfamiliar with accessing Earth observation data or are new to a specific dataset that will be used for their project. 2/3-2/6
    2. **Python** – covers the basics of Python programming and introduces geospatial Python topics including the use of ArcPy for ArcGIS Pro. Good for participants who have never programmed or never used Python before, especially for geospatial workflows. *Cannot enroll in R if enrolled in Python.* 2/10-2/12
    3. **R** – covers the basics of R programming and introduces geospatial R topics. Good for participants who have never programmed or never used R before, especially for geospatial workflows. *Cannot enroll in Python if enrolled in R.* 2/10-2/12
    4. **Advanced Topics** – covers advanced methods for accessing SpatioTemporal Access Catalogs using Python to retrieve and process imagery. Good for all Participants regardless of skill level 2/13
- Times and dates for all workshops available on the Spring 2025 Events calendar.



Project Deliverables

- DEVELOP places equal emphasis on research & analysis and **communicating your results**.
- Substantial efforts are put forth in developing deliverables that not only communicate the work done at DEVELOP, but enhance participants' skills: technical writing, coding, science communication, effective visualizations, video editing, etc.
- Deliverables are your opportunity to communicate your project work. Each deliverable is an example of your accomplishments. Use them to your advantage!
- All deliverables are important and used by DEVELOP in a variety of ways which are laid out on following slides.
- View details for each deliverable on DEVELOPedia and download the deliverable calendar for deadlines!

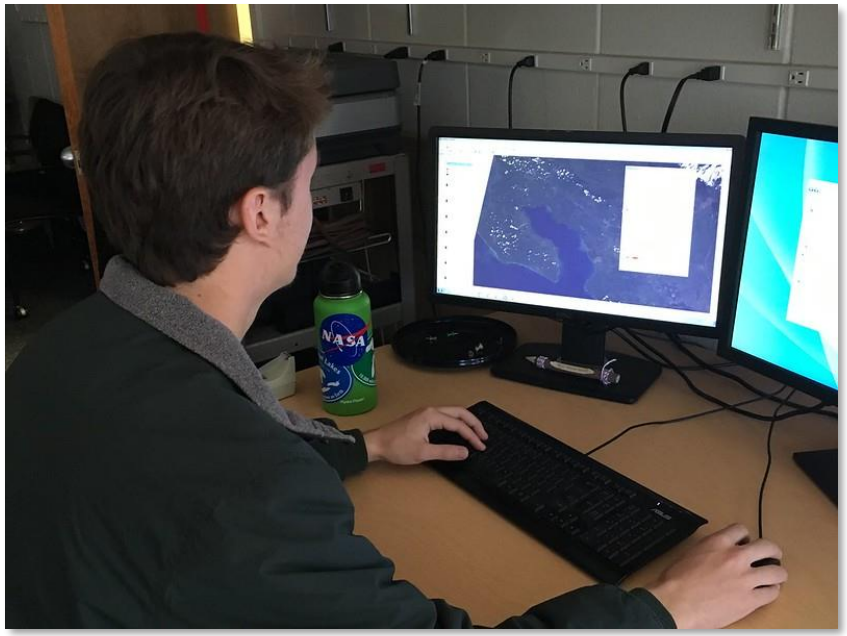
All Projects Create… a Project Summary, Study Area Shapefile, Presentation, Poster, Tech Paper, DEVELOPedia Page, Website Image, and a Project Feedback Form

Some Projects Create… a Tutorial, Video & Transcript, Code, Social Media Campaigns, Flyers and Brochures, One Pagers, etc.

Project Deliverables

Best Practices

- ✓ Tackle deliverables **incrementally** – start them early
- ✓ **Reuse content** from one deliverable for another – while each demonstrates your project in a different method of communication, many have shared core elements
- ✓ Always **review the deliverable templates and checklists** to ensure your deliverables are on point prior to submission to NPO. If it's evident the checklist was not followed, we may ask you to resubmit!
- ✓ All deliverables submitted will be **reviewed by your Lead and your Project Coordination point of contact**
- ✓ Building in time for Science Advisors to review is a **must**!
- ✓ Identify a POC within the team for each deliverable, but ensure that all team members contribute



By The Way

Export Control only controls what ***deliverables*** can be shared externally. You are not only allowed to, **but are encouraged to**, discuss the details of your project with friends, family, colleagues, etc!

Export Control

Export Control is NASA's program to ensure that scientific material being shared externally abides by federal regulations. All STI (Scientific & Technical Information) is submitted and reviewed. Once approved it can be shared externally to DEVELOP.

What does this mean to me?

- BEFORE sharing any materials outside DEVELOP, check with your Lead and NPO.
- Some project materials can be shared without going through export control (map products, preliminary results, imagery, videos), others must gain NASA approval first (tech paper, poster, presentation).
- All external publications (ex. peer-review publications) and conference presentations must also gain these approvals.
- The PC team (Brent, Marisa, Isabel, Laramie, Sarah, and Amanda) are your primary Export Control points of contact.

NASA Export Control: "As a U.S. Government Agency on the forefront of technological development and international cooperation in the fields of space, aeronautics, and science, the National Aeronautics and Space Administration will strive to fulfill its mission for cooperative international research and civil space development in harmony with the export control laws and regulations of the United States. Due to heightened proliferation challenges facing the United States and the world, including risks posed by the spread of missile technologies and weapons of mass destruction, and in view of the significant criminal, civil, and administrative penalties that may affect the Agency and its employees as a result of a failure to comply with U.S. export control laws and regulations, it is the responsibility of every NASA official and employee to ensure that the export control policies of the United States, including nonproliferation objectives, are fully observed in the pursuit of NASA's international mission."

Project Handoff

- Handoffs are where the team begins the transitioning of results and methodologies to partners in support of end users potentially integrating NASA Earth observations into their decision-making processes.
- Depending on what you are handing off, be cognizant that you must get materials approved by NASA prior to handoff.

Handoff Plan:

- Typical: 1-2 hour videoconference presenting the results and methodologies
- Other ideas: In-person presentation of results and methodologies (*when local*), virtual workshop and/or demo session
- During interim, the node Lead emails final deliverables (Tech Paper, Tutorials, Presentation, etc.) after they've been approved by export control

By The Way

Handoff vs. Closeout

Confusing? The handoff is where you "hand" your partner the results and methods, tailored for your audience, it is generally more in depth. A closeout event is a public presentation of information, partners may attend but the audience is broader.

Measuring Program and Project Impact

DEVELOP relies on several metrics to assess and understand the impact of our projects, partnerships, and participant engagement. Each project provides our program with a chance to positively impact science and society. To ensure that we are reaching our goals, each project must meet the following criteria:

1. Create a reproducible ‘recipe’ for accessing and analyzing EO data
2. Assess the feasibility of using NASA EO to inform action
3. Build capacity to use EO in end users and participants
4. Inform a decision or action
5. Benefit NASA and communicate benefits of the investment in EO to taxpayers

Quiz Time

- How many projects does DEVELOP conduct a year?
- What do all DEVELOP projects center around?
- Does NASA prescribe policy?
- How many types of partners are there?
- If you have international partners, what NASA organization needs to be aware of the project?
- Can teams pursuing similar projects reach out to other nodes?

Thank You.

“A place for everything and everything in its place.”

-- Benjamin Franklin --

EARTH
ACTION