

DEVELOP National Program



NASA DEVELOP National Program

FY2015 Strategic Planning & Leadership Retreat End Report

Overview

The DEVELOP National Program annually gathers its core leadership team to assess the past year, set strategic directions and action items for the upcoming year, evaluate trends and opportunities for growth and improvement, and collectively assess need for adjustments to the DEVELOP model. The attendees also participate in professional development activities such as personality type assessments, listening to guest speakers, and receiving performance reviews. From December 8-11th, representatives from all of DEVELOP's domestic nodes convened at NASA Langley Research Center in Hampton, Virginia for the FY2015 Annual Strategic Planning & Leadership Retreat. Discussions focused around the FY15 Class of Young Professional's four critical elements: Communication, Project Coordination, Impact Analysis and Geoinformatics. A thorough analysis was also conducted of the program's best practices and improvements needed. This report outlines discussion and activities from the retreat and clarifies strategic initiatives and action items for the upcoming year.

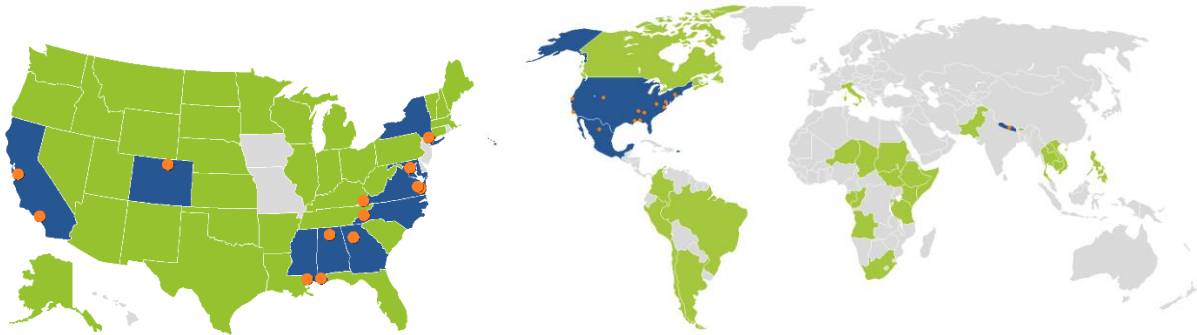
Retreat Participants

Karen Allsbrook , NPO Financial Lead
Jordan Bates , WC Center Lead
Mike Bender , NPO Technical Lead
Amber Brooks , Geoinformatics Young Professional
Beth Brumbaugh , Project Coordination Associate
Lauren Childs-Gleason , NPO Operations Lead
Georgina Crepps , Impact Analysis Young Professional & MCHD Center Lead
Colin Doyle , GSFC Center Lead (virtual)
Jeff Ely , Assistant to National Science Advisor
Jamie Favors , NPO Deputy Operations Lead
Peter Hawman , Project Coordination Young Professional & UGA Assistant Center Lead
Daniel Jensen , Geoinformatics Young Professional & JPL Assistant Center Lead
Amberle Keith , Project Coordination Young Professional & MSFC Assistant Center Lead
Chippie Kislik , Communications Young Professional & ARC Assistant Center Lead
Jerrod Lessel , Communications Young Professional & IRI Center Lead
Chris McKeel , Design Associate
Tiffani Miller , Project Coordination Associate
Alec Nelson , Communications Young Professional & GSFC Assistant Center Lead
Andrew Nguyen , ARC Center Lead
Nathan Owen , LaRC Center Lead
Dee Poupard , Support Analyst
Christine Rains , Project Coordination Young Professional & JPL Center Lead (virtual)
Ross Reahard , SSC Center Lead
Caren Remillard , UGA Center Lead
Lindsay Rogers , NPO Deputy Program Manager
Dr. Kenton Ross , NPO National Science Advisor
Mike Ruiz , NPO Program Manager
Merna Saad , Capacity Building Program Liaison
Leigh Sinclair , MSFC Center Lead (virtual)
Lance Watkins , Geoinformatics Young Professional & NCDC Center Lead
Amanda West , FC Center Lead

State of DEVELOP

2014 was a very active year for DEVELOP. The Program provided 379 participant research opportunities and conducted 83 feasibility projects. These projects partnered with 164 organizations to impact 44 US states and 38 countries. DEVELOPers participated in 37 science and policy conferences and 21 NASA meetings.

Domestic & International Impact



Highlight Activities

Programmatic Highlights

- DEVELOP conducted the most projects ever in one year (83) and created the DEVELOP Project Strength Index (PSI) in response to the need for tracking progress of projects similar to the Application Readiness Level (ARL) scale used by the Applied Sciences Program.
- The new DEVELOP online application system went live on January 20th providing an entirely paperless process for application collection and review.
- DEVELOP continued its military engagement initiative by meeting with Virginia's Secretary of Veterans and Defense Affairs, Retired Admiral John Harvey, Jr., to discuss collaboration and increased engagement of current and former U.S. Military service members. Throughout 2014, DEVELOP engaged 24 active duty volunteers, with an inaugural class of 16 volunteers in the summer term and 8 volunteers in the fall term.
- A new node opened in Asheville, North Carolina, hosted by NOAA's National Climatic Data Center.
- DEVELOP began project activity in Pocatello, Idaho in the fall term serving as the foundation for potential node site selection in 2015 supporting the Bureau of Land Management.
- The FY15 Young Professional Class of ten was selected out of 29 applicants who vied for positions in five elements (Project Coordination, Geoinformatics, Communication, Information Technology, and Impact Analysis).
- DEVELOP sponsored its inaugural Campus Ambassador Class (CAC), a network of DEVELOP alumni, typically summer participants, who return to their respective campuses in the fall with a volunteer commitment to host recruiting events throughout the academic year.
- The 2014 Annual Alumni Survey went out in July to assess DEVELOP's impact and collect information on where DEVELOPers are now. 39% of respondents employed in a STEM field report currently working with NASA Earth observations in their job.

Awards

- Jason Jones received the NASA Langley Center Director's Award for outstanding contributions to NASA and the DEVELOP National Program on March 5th.

- Amber Kuss received the 2014 Ames Honor Award in the student category and was presented with the award by the NASA Ames Center Director, Pete Worden on July 23rd.
- DEVELOP received an eLearning! 100 Award in recognition of excellence in learning across enterprises that invest in a truly immersive learning culture and enabling a learning culture that creates outstanding organizational performance.
- Wise DEVELOP scholar Faith Mwiza was awarded the Special African Prize in a European competition "Farming by Satellite" for her innovative idea on how to utilize drones for agricultural development in Rwanda.

Conferences & Meetings

- DEVELOP actively participated in 27 science conferences and meetings, 10 policy-focused conferences, and 21 NASA meetings and workshops.
- DEVELOP chaired two special sessions: one at the American Society for Photogrammetry and Remote Sensing (ASPRS) Annual Conference in Louisville, Kentucky and the second at the SouthEastern Division of the Association for American Geographers (SEDAAG) Annual Meeting in Athens, Georgia.
- DEVELOP had a strong presence at the AGU Fall Meeting with 3 oral presentations, 7 posters, 2 Ignite talks, one NASA booth talk and one Geoscience Professionals Showcase talk.

International Highlights

- DEVELOP collaborated with SERVIR's My Community Our Earth (MyCOE) Program, pairing up a Goddard DEVELOP project team with Vietnamese MyCOE fellow Nguyen Minh Khoa and his advisor, culminating in a capstone event at NASA Headquarters in April.
- Chile's CIREN sponsored DEVELOP to travel to Santiago, Chile, to conduct a three-day training workshop to hand-off project results and methodologies from the Langley DEVELOP Chile Water Resources project in October.

Communication Highlights

- DEVELOP partnered with Earthzine to host three Virtual Poster Sessions – spring (Mar 30), summer (Aug 4) and fall (Nov 22) – with a total of 83 videos demonstrating the application of NASA Earth observations.
- Goddard DEVELOP hosted a talk by Dr. John Mather, winner of the 2006 Nobel Prize in Physics. The talk was shared via video conferencing software, and attended by DEVELOPers across the country. Dr. Mather discussed his own scientific journey, NASA's current and future space exploration, the nature of the Universe, and beyond.

Mission, Vision & Core Values

Retreat discussion focused on the need for an update to DEVELOP's mission, vision and core values. The Applied Sciences Program is presently finalizing its new mission, vision, and core values, thus the national leadership team discussed minor updates that can be approved now and initiated for the summer term. The next Strategic Planning & Leadership Retreat will be focused on building new mission and vision statements, and core values, using the new ASP inputs as a foundation.

Mission

DEVELOP's mission, *"uniting NASA Earth observations with society to foster future innovation and cultivate the professionals of tomorrow by addressing diverse environmental issues today,"* was discussed and assessed at the retreat. A consensus voted that "uniting" should be replaced with "integrating".

New mission: “**Integrating NASA Earth observations with society to foster future innovation and cultivate the professionals of tomorrow by addressing diverse environmental issues today.**”

Vision

DEVELOP's current vision is “*To maximize NASA's Earth science investments by enabling the next generation to accelerate innovative applications in technology, resource management, policy development, and decision making.*”

The retreat consensus was the vision required more updating than the mission statement. Discussion is still ongoing and will continue virtually. Discussion included suggestions such as the following phrases:

- Build capacity to expand the application of NASA Earth observations
- Bridge the gap between science and society
- Catalyze broader and bolder engagement in applications, partnering the future workforce with society's decision-makers
- Accelerate innovative applications through building operational understanding of NASA Earth observations
- Innovative use of Earth observations by empowering others to benefit society
- Empower innovative use of Earth science as an instrument of good for society
- Transform data into information to sustainably confront a changing environment
- Empower society with information to address a changing environment
- DEVELOP: Practically Innovative

The NPO will craft options based on these inputs and the national team will vote on the best vision to implement ahead of the summer term.

Core Values

DEVELOP presently has eight core values that demonstrate the Program's ideals: Innovation, Service, Integrity, Passion, Professionalism, Stewardship, Scholarship, and Collaboration. Retreat discussion highlighted that eight may be too many, some of the core values may be outdated regarding programmatic changes that have taken place in recent years, and that a more refined set of core values would be easier to communicate. When put to a vote, the results found that the national leadership team idealized: Collaboration (24 votes), Innovation (14), Passion (13), Discovery (12), Integrity (8), Professionalism (7), Service (4) and Stewardship (2). While a concern that Innovation and Discovery are too similar arose, presently the program will move forward for the summer term with:

1. **Collaboration:** Cultivating teamwork, multi-disciplinary solutions, and open communication to bridge the gap between science and society.
2. **Innovation:** Fostering rapid feasibility projects to harness ingenuity and demonstrate the applications of Earth science.
3. **Passion:** Pursuing all endeavors with energy, excitement, and enthusiasm to sustain a high level of excellence and respect.
4. **Discovery:** Exploring [the potential / the benefits] of NASA's investment in Earth science to make the extraordinary possible.

Young Professional Initiatives Overview

In 2012, DEVELOP formalized its Young Professional positions into a “class” structure with a competitive application process and formal eligibility requirements. Each YP position serves in a dual-role for one year, splitting their time between one of the DEVELOP nodes and NPO-led

tasks. The one year experience provides both personal and professional growth opportunities that contribute to the program as a whole.

For FY2015, the Young Professional Class was organized around four thematic elements: Project Coordination, Geoinformatics, Communication, and Impact Analysis. The class meets bi-weekly during a DEVELOP “Junto” where each YP reports status updates and one telecon participant hosts a dialogue on a preselected discussion topic.

Each of element teams led retreat discussions regarding their initiatives, potential improvements and action items for the upcoming year. The timeline for completion of action items is the end of the YP Class term in mid-September. Each element team will work with the Associates and NPO to establish a calendar of milestones and deadlines.

Project Coordination

Contributors: YPs - Peter Hawman, Amberle Keith, Christine Rains; Associates - Beth Brumbaugh, Tiffani Miller; NPO - Lauren Childs-Gleason, Jamie Favors

The Project Coordination Team supports the coordination of the project portfolio throughout the project lifecycle, including project idea formulation, proposal phase, project execution, final reporting and presentation, publication, and project assessment. The team consists of three Young Professionals located at UGA, JPL, and MSFC, two Project Coordination Associates at LaRC, and two NPO staff members.

Project Tracking

The project tracking spreadsheet is a main initiative for the Project Coordination Team. Continuing the work of previous PC Young professionals, missing information from projects dating back to 1998 is being populated. Fields of information include NASA Earth Observations used, ancillary datasets, team members, science advisors, project partners, study area, and national application areas. The completion of this spreadsheet will provide the National Program Office with a collated list of all projects. With the addition of a new Project ID proposed during the 2014 Strategic Planning and Leadership retreat, all projects will have a unique identifier. The project ID will effectively link the project tracking spreadsheet with a new tracking spreadsheet focusing on project partners.

Action Items:

- Complete the project tracking spreadsheet.
- Create unique project tracking identification numbers.

Partner Tracking

One of DEVELOP's goals is to understand who is being impacted by the work and where DEVELOP can expand its reach to new sectors. Compiling a list of all partners that worked with DEVELOP will allow for this assessment. This spreadsheet contains the project and term associated with each partner in addition to the main point of contact and the partner type: Federal, State, Academic, NGO or International. This spreadsheet will include and identify where the entity is an End-User, Partner or Boundary Organization.

Action Items:

- Formalize partner type definitions and distribute to the national team.
- Complete the partner tracking spreadsheet by populating all previous terms and projects for which materials exist.

Partner Engagement

The Project Coordination Team oversees all partner engagement from pre-proposal writing needs assessment, through project execution and results/methodology hand-off, to post-project evaluation. The initial communication with partners involves an assessment of partner capabilities which aim to understand needs and present use of NASA datasets. The team collects metrics for hand-off activities, and follows up with a post-project exit evaluation to assess success of end-products and sustained use by partners.

Action Items:

- Standardize pre-project partner capability and needs assessments.
- Formalize the post-project exit evaluation.

Impact Maps

Impact maps are created each term, visually displaying DEVELOP's impact throughout the United States and the world. Traditionally, these maps take the form of choropleth maps with the project's study area as the theme. One initiative is to collect previous impact maps to produce a visual history of DEVELOP's growth, displaying the expansion over time. A new idea proposed during the 2014 Strategic Planning and Leadership retreat aims to create similar impact maps but focusing on national application areas addressed. Mapping not only where projects occur but also their focus can inform the DEVELOP program about its impact from an applications standpoint. Locating areas with heavy Water Resources or Ecological Forecasting projects could potentially spark new and innovative work that may be overlooked.

Action Items:

- Collect previous impact maps and materials and make a comprehensive time series.
- Create maps focused on specific ASP National Application Areas.

Project Strength Index (PSI)

Similar to ASP's ARL scale, DEVELOP created the Project Strength Index (PSI) in which scores are evaluated for every project each term as a means of assessing a project's progression and success. The scores are evaluated on an index that aims to objectively track and measure projects. The PSI survey has two sections, each with a possible 21 points: 1) Policy & Partner (P & P) and 2) Platform & Science (P & S). The PSI index is then used to produce the project's stage number (1 to 5). The stage numbers are as follows: 1) Stage 1 - Basic Research, 2) Stage 2 - Application Concept Complete, 3) Stage 3 - Application Demonstration Successful, 4) Stage 4 - Application Verified / End-user Engaged, and 5) Stage 5 - Transition to End-User / Decision Enhanced. Ideally, projects that are continued should receive a higher score than the term before, show progress overall, and aim for a Stage 5 ranking.

Action Items:

- Share the PSI rubric with all incoming participants.
- Create individualized PSI reports for each node following submission of PSI scores.
- Increase use of PSI results in other facets of DEVELOP (ex. annual report highlight selection).

Deliverable Management

Each project submits six deliverables which are designed to help the participants develop their personal skills in writing, presenting, and organizing their thoughts and project results. The six deliverables are the Project Summary, Technical Paper, PowerPoint Presentation, Poster, Final Imagery, and Video Poster Session (VPS). These documents are submitted to the Project

Coordination Team for review during which time the deliverables are edited for grammar, punctuation, and scientific guidance and suggestions. The rough drafts are then returned for edits and updated results are incorporated by the team. The teams submit final versions of the deliverables at predetermined deadlines throughout the term.

Action Items:

- Streamline the review process so that the turnaround time back to teams is shorter.
- Create a standard review checklist to ensure consistent review practices.
- Streamline deliverables so that the abstract is only submitted and "living" in one deliverable until the end when it can be inserted into all others.
- Create/distribute guidelines for deliverable creation to improve knowledge of what's expected, best practices, including "do's and don'ts".

Virtual Poster Sessions

Each term the teams create a four minute-long VPS to give a synopsis of their projects. These videos are shared on the Earthzine webpage for a competition in which public comment is opened. After the week-long commenting session, the videos are judged based on scientific merit, the interaction from the public and the team, quality of the video, creativity, etc. The winning team is awarded a one-year license to ArcGIS. The Project Coordination Team assists with the collection, compilation and editing of VPS content so that it can be quickly and efficiently handed-off to the Communication Team.

Action Items:

- Ensure review of VPS content is streamlined and supports all Earthzine deadlines.

DEVELOPedia

The Project Coordination Team works with the Tech Team to submit project information, such as the title and the team members, to DEVELOPedia. The PC Team assists with maintaining project content on DEVELOPedia so as to ensure the website is current and complete.

Action Items:

- Continue to submit project archive materials and information.
- Brainstorm processes within Project Coordination that could be streamlined or improved in DEVELOPedia.

Geoinformatics

Contributors: YPs - Amber Brooks, Daniel Jensen, Lance Watkins; Support - Jeff Ely; NPO - Mike Bender, Dr. Kenton Ross

The Geoinformatics Team strives to increase capacity within DEVELOP, its participants and society, by understanding current participant skill levels, heightening skill levels through tutorials and trainings, assisting in defining project partner/end-user requirements, and advocating for the use of technologies that optimize scientific and analytic project workflows. In order to build capacity within a structured manner, the following five Geoinformatics initiatives were formed by the FY15 Geoinformatics Team: Software Release, DEVELOP Python Module, Code Repository, Online Mapping and Skill Building. The team also conducted an evaluation of the DEVELOP participant user base and current technologies utilized at program nodes.

Participant Skill Evaluation

The evaluation was designed to capture participant experience levels and identify where participants need support to enable targeted efforts for improved support from the National

Program. The evaluation identified technical skills that participants desired to develop and requests for specific software. Participants requested access to existing data processing scripts, software and scripting tutorials (Python, R, and ArcGIS), short instructional videos, best practices for scripting, and tutorials for specific types of image analysis (including atmospheric correction, land classification, regression trees, and image enhancement). This evaluation provided a starting point to direct efforts to support the National teams.

Action Items:

- Work with Impact Analysis Team to improve the Participant Skill Evaluation.
- Incorporate the evaluation into participant entrance and exit assessments.

Software Release

Software release is a necessary part of any partner hand-off with deliverables that include substantial software and code that have not already been approved for public release by the agency. All participants are contracted through DEVELOP HQ at NASA Langley Research Center, therefore all DEVELOP participants must adhere to the software release requirements observed at Langley. DEVELOP has established a process for completing the software release, which the Program is hosting on DEVELOPedia as an internal resource for project teams.

Action Items:

- Clarify types of project deliverables requiring software release approval.
- Create a procedural framework to allow prompt support for teams to complete software release requirements in the 10-week timeline, taking into consideration Center Lead involvement without placing undue burden on Center Leads.

Code Repository

A code repository is a digital environment that supports many users and contributors through software version control and distribution architecture. DEVELOP must abide by NASA regulation of social media and software release, meaning anything released for public use must complete the applicable approval process. To aid in organization and development for NASA approval, the Geoinformatics Team has defined two "Git" environments to be used as part of the DEVELOP code repository strategy: Github and Gitlab.

A Git, used in the creation and testing of software or code, is a fast, non-linear, version control system that allows a group of people to work together using the same files remotely. GitHub, a git client, will be used as a free and public forum to host code base of software that has been properly approved by NASA regulators and export control. The agency has a Github account where Software Release approved projects and code are made available to the public. GitLab will be used internally by DEVELOP as a free private code bucket or "code nursery" to host, implement and track updates to software that is not yet ready for software release. Both DEVELOP participants and the public will be able to download the dnp.py module for use through Github for free. Transferring project repositories from GitLab to Github when approval is granted is simple.

Action Items:

- Gain social media account approval for NASA DEVELOP GitHub (pending).
- Document use protocol and structure of DEVELOP code repository for continued use.
- Distribute access and use information to all program nodes when the repositories come online for download access and/or contribution to scripting projects.

DEVELOP Python Package (dnppy)

The DEVELOP Python Package is a library of functional “building blocks” of python code, grouped into modules, created to improve institutional knowledge retention, open the DEVELOP toolkit for public contributions and use, represent DEVELOP in the public domain, and put more power in the hands of new participants the first day they begin the program. To meet projects’ increasing need to manipulate data, processing can be performed in Python using the “dnppy” (pronounced “done-pie”) package which is used to functionalize common programming tasks in the geospatial community, specifically for working with NASA data products. As of December 1st, 2014, the DEVELOP National Program Python Package has been approved for Open Source Software Release by the agency. According to LPR 7150.2, the software component for this Project is classified as Class E – Small Lightweight Design Concept and Research and Technology Software which is defined as: 1) Software developed to explore a design concept or hypothesis, but not used to make decisions for an operational Class A, B, or C system or to-be built Class A, B, or C system, or 2) Software used to perform minor desktop analysis of science or experimental data.

Action Items:

- Document use protocol and structure of the DEVELOP Python Module for future use by participants and management hand-off.
- Create email alerts to distribute to Geoinformatics Team when a help ticket is created within DEVELOPedia.
- Continue to enhance functionality, prioritizing Landsat, then TRMM/GPM and other precipitation data sources.
- Connect with NASA’s Github managers at Ames to discuss hosting the public Git for dnppy in conjunction with other NASA Open Source Approved Projects.

Online Mapping

Online mapping, or the art and science of interacting with a map in an online interface, is made possible by Web GIS. Web GIS harnesses the power of world wide web or “cloud” technologies to communicate geospatial information and GIS processes between servers, data storage and people. There are different levels of Web GIS available for implementation, however, the main functions of a true web GIS system are: 1) mapping (visualization) and query, 2) the collection of geospatial information (field data collection or voluntary), 3) the dissemination of geospatial information, and 4) geospatial analysis in the cloud. DEVELOP can benefit from an online mapping initiative through strengthened communication and collaboration between teams, DEVELOP nodes, and project partners. DEVELOP aims to have a broad portfolio of online mapping options that include open source and free alternatives.

Google Maps Engine / Google Maps Gallery

As part of the Geoinformatics Team’s online mapping initiative, DEVELOP has created its own dedicated published account in the Google Maps Gallery, a non-interactive digital atlas where anyone can find maps published by schools, businesses, nonprofits, and government agencies. For DEVELOP, this is a valuable tool not just for the visualization of projects’ final results, but for public outreach and communication. The primary function of the gallery is to offer the public viewing access to project maps, which can educate the public about the subject matter of each individual project, about what can be done with NASA’s Earth observation systems, and about the DEVELOP program itself. Google recently announced that it will be ending support for the Google Map Engine and will close the Google Map Gallery by January 29, 2016. DEVELOP will continue to use the GMG to share project maps with the public through 2015, but will actively seek out alternatives to share maps, data and information in a similar fashion.

ArcGIS Online for Organizations

ArcGIS Online for Organizations (AGOL) is a collaborative, cloud-based mapping platform that allows members to use, create and publish data through desktop without having to convert to KML. AGOL is integrated with the entire ArcGIS system and allows a user to easily generate editable data services for field data collection via mobile devices, publish map data content directly from ArcGIS Desktop for use by others in online maps or desktop, and utilize Esri imagery services, within desktop to perform image analysis. NASA awarded Esri Option Year 2 of two enterprise license agreement (ELA) for software licenses and support beginning 10/1/2014 and ending 10/1/ 2015. During the term of the ELA, DEVELOP aims to investigate increased use of ArcGIS Online for sharing maps between team members, other nodes and with partners. DEVELOP will explore the notion of purchasing its own account in the event that NASA does not continue the ELA with Esri and in an effort to be able to include non-NASA locations.

Action Items:

- Evaluate alternatives to Google Map Gallery and ArcGIS Online for sharing DEVELOP project results.
- Transition all content out of the Google Map Engine by the end of 2015.
- Assess cost for obtaining DEVELOP AGOL account on a national scale.
- Explore potential sponsorship through Esri Education Services for AGOL account.

Technical Training & Skill Building

The Geoinformatics Team is expanding the technical help and training services offered to the program. In addition to in-person and virtual help currently provided to teams, the Geoinformatics Team plans to create tutorials addressing a wide range of tools and methods available to all participants. These materials will be shared through DEVELOPedia, which currently houses a list of resources to help participants with data/software access and technical help. This will be expanded to offer more comprehensive coverage of resources that teams may need. The dnppy module will be supported with tutorials and instructions through its own DEVELOPedia page maintained by the Geoinformatics Team. Dnppy's DEVELOPedia page describes its structure and usage, how to install it, and its component modules. There are also links to add functions, add modules, and report bugs. To add to dnppy's functionality and usefulness, a series of instructional tutorials will be developed to educate participants on its implementation. Additionally, more tutorials will be developed for other resources, including tools to learn how to script and use certain software platforms.

Action Items:

- Create extensive tutorials (video/documents) to guide use of dnppy, and to guide Python programming as a whole.
- Integrate tutorials into DEVELOPedia, but also allow them to function well as a stand-alone resource for users outside the DEVELOP program.
- Create tutorials or link to external ones in a well-organized manner by topic: obtaining data, data processing and analysis in ArcGIS, data processing and analysis in ENVI, using specific common tools such as SWAT or MGET.

Communications

Contributors: YPs - Chippie Kislik, Jerrod Lessel, Alec Nelson; Associates – Beth Brumbaugh, Chris McKeel, Tiffani Miller; NPO – Lauren Childs-Gleason, Lindsay Rogers

The Communications Team oversees all social media accounts and activity, video creation, virtual poster sessions, the DEVELOP newsletter, podcasts, recruiting, promotion and branding of the program, and other communication initiatives.

VPS Videos

As DEVELOP has grown over the years, so too has the quality of the Virtual Poster Session (VPS) videos that are presented on the Earthzine website. While these videos take time to script and produce, they are one of DEVELOP's most public-facing deliverables; therefore, it is important that the program represents its projects in a high-quality manner. Several DEVELOP participants have discussed the challenge of producing a professional video in a matter of several weeks with limited technological skills and resources. Former Communications Team member Alec Nelson has created video production tutorials that can assist teams in improving their filming techniques. These tutorials are available to the DEVELOP participants, and they provide general tips and tricks on how to create high quality videos that convey the information of the project for the benefit of the viewers.

Action Items:

- Promote the creation of high-quality VPS videos.
- Clarify the audience and level of professionalism required.
- As some teams do not have the software or equipment required to make high-quality videos, assess how DEVELOP could purchase a floating software license or provide a kit of proper equipment.
- Increase emphasis on the VPS not only during the summer term, but in the fall and spring terms through enhanced messaging to teams.
- Provide a canned script or template (style guide, typography suggestions, best practices) for projects that cannot invest as much time/energy into the VPS, or do not have the skills to do so.

VPS Judging Process

All VPS videos are publicized through the Earthzine website and hosted on DEVELOP's YouTube Channel. Earthzine hosts a competition among all submitted videos, and winners receive prizes if judges rate their video the highest. DEVELOP has created a VPS rubric describing the four categories upon which their videos will be judged: Content Clarity, Memorable/Creativity, Production, and Blogging. Currently, each category is weighted equally at 25%, and there has been discussion about altering the weights of some categories to more accurately reflect the efforts put forth to produce the videos. There has also been discussion about how the videos are judged, and by whom they are judged. The goal is to provide more transparency in the grading and judging of the VPS videos.

Action Items:

- Evaluate rubric and amendments needed with a focus on clarity and objectivity.
- Work with Earthzine and Livefyre to correct issues regarding comments not posting.
- Promote teams commenting on other teams' projects, but take away scoring emphasis.
- Have each node nominate a judge (not presently active in DEVELOP).
- Return judging process to a two-tier system as was done in previous years.

Podcasts

Over the past year, the DEVELOP Communications Team has created several podcasts available on the main DEVELOP website. Tutorials were created on how to successfully create high-quality podcasts, which serve as a reference for any DEVELOP team opting to create a podcast. The podcast structure has evolved over the past year into two styles: 1) an informal news and discussion format in which participants gather and discuss the latest news relating to space, Earth science, remote sensing, and science in general, and 2) a storytelling platform in which there is a central story (usually a project or interview) throughout the podcast, with sound effects and music setting the tone of the story told.

Action Items:

- Encourage more DEVELOP participants to create podcasts.
- Evaluate a distribution schedule (potentially monthly).
- Assess the purchase of a podcast kit that could be transferred between nodes when a team doesn't have proper equipment to create a high quality podcast at their location.

Newsletter

Each term, the Communications Team produces a newsletter, *The DEVELOPer*, and sends it out to all current participants, alumni, and various partners and NASA personnel. Each issue features interviews, node highlights, articles, events, and photos, and in recent terms has amounted to 40+ pages. Retreat discussion focused on a need for better defining the audience for the newsletter so that appropriate length could be determined. The discussion also focused on a potential photo contest featured in the next edition of the newsletter, which would help promote internode competition and communication, and bring more focus to newsletter imagery.

Action items:

- Improve understanding of the audience and purpose of the DEVELOPer Newsletter.
- Gauge how DEVELOP participants feel about the newsletter.
- Assess cutting stories or articles and focusing solely on highlights and conferences.
- Evaluate starting a newsletter photo contest.

Peer-Reviewed Publications

During the retreat, the Communications Team presented tips and suggestions on how to prepare project reports for peer-reviewed publication. These tips included determining how to check which journals to submit to, how to gauge the progress of an author, and how to know which projects to submit. The ultimate goal is to provide resources for how to submit projects and papers to peer-reviewed publications, and increase the number of publications for DEVELOP.

Action Items:

- Compile publication tips and guidelines into a short summary report and distribute.
- Use Scopus to review the Impact Factor and H-index of a paper.
- Re-engage with previous publication venues and reach out to new publication venues.
- Increase publication numbers for 2015.
- Consider the creation of a DEVELOP micro-journal.

Internode Communication

Many DEVELOP participants would like to engage with their counterparts in other nodes more frequently, and they determined that the Communications Team can help facilitate these interactions. There has been discussion on promoting the utilization of the current "buddy system," in which each node is paired with another to serve as a resource when Center Leads have questions. There has also been discussion about opening communication among participants and team members across nodes, and many were receptive to this idea.

Action items:

- Utilize video conferencing between nodes more often.
- Increase use of the node "buddy system" for more effective communication.
- Pair up returning DEVELOP participants with first-term participants.
- Utilize the 'Flat Stanley' or photo contest as friendly competition among nodes.
- Promote communication among nodes on DEVELOPedia.

Impact Analysis

Contributors: YP - Georgina Crepps; NPO - Lauren Childs-Gleason, Jamie Favors, Lindsay Rogers

The Impact Analysis initiative is new within the Young Professional Class and geared toward assessing the impacts of the DEVELOP National Program. These impacts can be considered in broad terms to relate to projects, partners, and participants. The impacts of these three categories overlap in terms of assessing capacity building and decision-making. While DEVELOP had several methods in place for assessing these impacts, the IA YP has worked on creating new methodologies to provide baseline data for these analyses, as well as refining those currently in place.

Results Framework & Indicators

The Results Framework and Indicators measure DEVELOP's progress in building capacity by utilizing specific data as indicators for activities such as building awareness, engaging participants, and increasing the use of Earth observations in decision-making. DEVELOP is working with the Capacity Building Program and its elements to identify shared indicators that can be tracked across the program as a whole.

Action Items:

- Compile FY2014 results & indicators.
- Assist with identifying indicators that are shared across all CBP elements.

Indicator Tracking Metrics

The Indicator Tracking Metrics is an Excel workbook in which each node reports a variety of data including node participants, projects, and training activities, among other information. However, many Center Leads have struggled with accurately providing this data. In addition, as DEVELOP has grown, changes are needed to better reflect the type of participants in the program. As a result, the Impact Analysis Team created an updated version of the Indicator Tracking for FY2015. The new workbook includes numerous help features, as well as a help guide, to better enable Center Leads to fill them out. Furthermore, the workbook now allows for the tracking of the participation of active duty and veterans of the U.S. Military. Gender tracking of leadership positions within nodes is also included to support reporting for the Equal Futures Initiative.

Action Items:

- Compile FY and CY 2014 results.
- Complete and send out new tracking metrics workbook and help guide for FY2015.

Equal Futures Reporting

The Equal Futures Report illustrates DEVELOP's activities geared toward increasing gender equality in the sciences. Each year the previous years' activities are assessed and new milestone goals are set for the upcoming year. New milestones for FY2015 include beginning to track women in DEVELOP leadership roles, and engaging with female-oriented student groups at universities.

Action Items:

- Encourage DEVELOP participants to become involved to meet Equal Futures milestones.
- Track quantity of women in DEVELOP leadership roles.
- Engage with female-oriented student groups at universities.

Alumni Survey

The Alumni Survey is one of DEVELOP's methods to track former participants. This survey gathers information about what participants feel they gained from their time at DEVELOP, and education and employment information. This survey provides a longer-term perspective on the impacts of DEVELOP, as it captures how the DEVELOP experience had affected participants beyond their involvement in the program.

Action Items:

- Refine questions and increase response rate.

Beginning & End of Term Participant Evaluations

As a program focused on capacity building, DEVELOP works to cultivate the technical and professional skills of its participants. While Wise County has been conducting an alumni survey asking former participants questions regarding the skills they had gained, this year the Impact Analysis Team designed an evaluation to be administered at the beginning and end of each term to gauge participants expectations, and a self-assessment. This was successfully done for a small subset of nodes for the Fall 2014 term.

Action Items:

- Work with Geoinformatics Team to incorporate the Participant Skill Evaluation.
- Extend the evaluation to all participants at all nodes.

Pre-Project Partner Needs Assessment & End-User Exit Evaluation

As a program focused on building capacity, DEVELOP strives to increase awareness and capabilities of project partners, as well as participants. In the past, evaluations of project end-users provided feedback regarding what was gained from partnering with DEVELOP, including skills gained and use of project results in decision-making. The End-User Exit Evaluation will serve as a base for conducting socioeconomic impact analyses, discussed below. However, to more fully understand how capacity is being built, the Pre-Project Needs Assessment was created to gather baseline data for partner capacity.

Action Items:

- Work with Project Coordination Team to refine questions for partner needs assessments.

Socioeconomic Impact Analyses

DEVELOP projects aim to assist partners in their decision-making through the use of NASA remote sensing. Results, tutorials, etc. are given to partners at the end of a project term to enable them to do so. After the end of the term, DEVELOP utilizes an End-User Exit Evaluation to gather information about how end-users are implementing project results. The purpose of the End-User Exit Survey is to provide basic data about end-users' decision-making for all projects. However, DEVELOP is also working to gain greater insight into the impacts of its projects by conducting socioeconomic impact analyses for a few of the projects. A socioeconomic impact analysis of a project will consist with working with the project partners to understand how their decision-making has been affected, quantify the impacts, and monetize them when possible. Such analyses will serve to illustrate how DEVELOP projects are aiding partners in their decision-making.

Action Items:

- Assess suitable projects for further analysis and contact partner organizations to discuss their use of project results.

Incubator Talks

The DEVELOP Incubator Talk series began at the 2013 retreat as a forum for DEVELOP leadership to rapidly gather innovative and strategic ideas in a creative way. Each presenter has 2½ minutes to give a ten slide presentation, with each slide automatically progressing every 15 seconds. The theme of each talk focuses on the next big idea for DEVELOP and responds to one of the two prompts:

1. If you were in charge of DEVELOP, what would you change or add?
2. Where would you like the organization to be in 5 years?

FY2015 Retreat Incubator Talk Themes:

Fostering Collaboration & Communication

- Foster more collaborative projects across nodes
- Conduct more joint virtual close outs
- Host more videoconferences and national competitions
- Increase collaborative problem-solving through new forums

Expanding DEVELOP's Reach

- Remote Sensing of other planets – use Earth-based analogs
- Increase focus on the City/Urban Places
- Become a member of the NOAA Weather Ready Nation
- Replication by other international space agencies
- Increasing awareness of the DEVELOP brand at national conferences
- Increasing the DEVELOP network and awareness of DEVELOP

End-User Engagement

- Increase follow-up with end-users
- Cater to partner needs through a “wish list” on the website

Enhance Leadership & Project Support

- Increased time and project management training
- Improve tools available for video creation and editing through a one stop shop
- New project coordination strategy using the cloud

Increase Alumni Engagement

- Increase engagement of alumni through social media
- Plan a 20 year anniversary reunion (2018)

Project Model Alterations

- Re-evaluate the three-term project model
- Adjust the DEVELOP model to include a 4th term where a DEVELOPer is co-located with the partner organization

Project Communication

- Interactive map of all DEVELOP projects, data layers
- Open access to past projects through a spatial data archive
- Create a bracket system competition for VPS with a blogging showdown
- New communication training resources for teams
- Update DEVELOP print materials & branding through new color schemes and imagery

What's Working, What's Not Working

The DEVELOP Retreat organized much of the discussion thematically in eight areas: Center Lead Position, Young Professional Position, Science Advisors, National Program Office, Policies & Procedures, Projects, Nodes, and Miscellaneous. Below is an overview of discussion in each area regarding what was deemed as working, where problems are occurring, and potential solutions to those problems.

Center Lead Position

Contributors: Caren Remillard, Georgina Crepps, Jerrod Lessel

What's Working

The Center Lead (CL) is an integral piece of the leadership team in the DEVELOP model. The people who assume this role are responsible for handling the majority of the day-to-day operations at their individual nodes. One of the primary contributions of the CL position is that it creates an effective, open line of communication between the participants and NPO. This can be seen through the information they distribute to their nodes following the weekly telecons and follow-up notes from NPO. The telecons allow for meaningful synopses of each group's work and encourage collaboration and the sharing of ideas across nodes. The CL position is enhanced by the support of the Assistant Center Lead (ACL). The ACL position helps alleviate the pressure and workload, especially during the final weeks of a term, and for CLs with additional responsibilities within DEVELOP.

What's Not Working & Potential Solutions

CLs must reapply each term, similar to all other participants. However, once in the CL position, there is no competitive selection that occurs each term. This can create an atmosphere of uncertainty in the continuity of node leadership for the node, as well block new CL candidates the opportunity to vie for the position. Suggestions for addressing the issue would be to make the Center Lead position similar to the YP positions in length. This would foster relationships in the node's professional community and further growth for the CL. This could be attained by making Center Lead a more competitive position, which could entail more substantially incentivizing the position, broadening the field of who qualifies in order to increase the applicant pool's quality, an additional interview process, and professional grooming for candidates. Considerations will be made regarding the hours CLs are permitted to work if they are classified as a student, as well as the potential for an individual to become "entrenched" in the CL position, limiting the opportunity of others to become the CL. By pursuing these objectives for the Center Lead position, each node would benefit from increased stability and higher quality leadership, leading to more engaged participants and robust outputs.

Another concern relates to CL training and performance reviews. Some CLs struggle with generating project ideas and feel they could benefit from additional resources and training regarding this process. The current CLs put forward an idea for an "Unclaimed Project" page on DEVELOPedia. It could include the center the project originated and a project readiness score:

1. 0=idea, no partner
2. 1=idea, intended partner
3. 2=idea, partner contact initiated
4. 3=idea and partner commitment

CLs expressed the challenges of managing their numerous duties, and thought that having additional organization tools, such as a shared group calendar or a Gantt chart could be of use. Furthermore, it is suggested that the previous CL and incoming CL have an overlapping transition period to facilitate leadership transitions. Additional materials or workshops provided

by NPO could also help CLs feel more confident in their role. Overall, new CLs should be encouraged to reach out to veteran CLs and NPO for advice, project ideas, and brainstorming sessions. The possibility of having a telecon solely for CLs only was also discussed. Potentially spaced out to be before the beginning of a term, in the middle of a term, and after the end of a term. This would provide CLs an opportunity to discuss issues, questions, and interact between nodes in a less formal manner. Lastly, many CLs voiced disappointment over the lack of feedback on CL job performance from NPO and the desire for performance reviews. It was suggested that CLs could have a review with NPO, possibly assisted by Associates or YPs, to discuss what they are doing well and what they can improve upon, modeled after the YP mid-year review.

Young Professional Position

Contributors: Andrew Nguyen, Lance Watkins, Chris McKeel

What's Working

Presence of a Young Professional (YP) at a node improves the node's connection to NPO, encourages a node to reach out to various resources available, helps alleviate stress and responsibility from CLs and/or Science Advisors, and improves the quality of projects. The distribution of YPs to under-supported and/or new nodes is valuable to improving project quality, establishing the node, and bringing continuity to its structure. Many YPs serve in the ACL position, which has been found to be a better balance of responsibilities than the CL position, and allows for flexibility and conducting smoother management transitions. Lastly, YPs are given a lot of freedom to contribute to DEVELOP as their skills allow.

What's Not Working & Potential Solutions

Transitions between YP Classes are a work in progress, and could benefit from increased NPO guidance, especially in the form of more detailed outline of expectations, and a higher emphasis put on the hand-off from the outgoing YP Class. Another solution is to designate a lead for each of the YP elements who could support the other YPs in defining objectives, track progress of the element team, and ensure that the YP Class is working towards the broader vision of DEVELOP.

There is no means of backfilling a YP position when an individual leaves before the end of their term. This recent class saw two YPs leave before the YP year began, and further demonstrated the need for some process to fill these positions once vacant. Possible suggestions are: 1) hire more YPs at the beginning knowing that some will leave, 2) offer the position to a YP applicant that was not selected in the first round, 3) select someone who did not apply to the YP Class but that has the desired skillsets, or 4) place a larger emphasis on commitment to the contract and remaining for the year.

The workload can be uneven among YPs, which is in part due to the nature of each position. DEVELOP should consider improving communication and delegation of tasks within each YP element. As each YP position is dual in nature, the piece that supports the node should be optimized so that the YP does not have to serve as the CL whenever possible as that can limit the amount of time available to serve the national organization. Regional nodes can benefit greatly from YPs, and thus if one will not receive a YP for the year, early communication to the node leadership should take place.

The "Young Professional" title is not recognized outside DEVELOP, which causes confusion as to what it means exactly. Changing the title to "Fellow" was discussed and positively received. YP position titles for each element should be assessed for relevancy to the outside job market to facilitate better crossover of participants to future employment.

The Mentor Program that took place in the FY14 YP Class was beneficial to the YPs and should be reinstated. The mentors served as a great resource for answering questions about jobs, making career decisions, opportunities, and general personal development. One option is to provide the option to the YP if they are interested, then match them with a mentor.

Science Advisors

Contributors: Amanda West, Chippie Kislik, Jeff Ely

What's Working

DEVELOP Science Advisors (SA) play a critical role in overseeing scientific integrity within the DEVELOP Program. Although the role of a Science Advisor varies across different DEVELOP locations, their time, guidance, and approval is valued tremendously by each node. Not only do they review projects for their scientific accuracy and assist in the creation of project ideas, but they also contribute to writing project proposals, share ideas for seminars and conferences, communicate with Center Leads about the progress of projects throughout the term, interact with project partners and end-users, suggest new partnerships, and help leverage resources for the program. Science Advisors prove to be an invaluable resource within the DEVELOP community, and there are several suggestions that have been discussed to further improve the role of the Science Advisor in the DEVELOP National Program.

What's Not Working & Potential Solutions

Science Advisor interaction is commonly mentioned in participant exit surveys as something nodes need more of. Solutions include: 1) better define SA responsibilities to stimulate greater commitment to teams, keeping in consideration that SAs are funded through different mechanisms or perform work entirely pro-bono, 2) provide SAs with a non-threatening/non-binding manual of best practices while maintaining autonomy, 3) distribute a list of all DEVELOP SAs and their respective areas of expertise for enhanced specialized advising within appropriate communication channels and attempting to minimize workload, 4) leverage resources to gain expertise or knowledge from project partners, and 5) create a way to recognize Science Advisors' contributions in a public way to incentivize continued engagement.

While a SA's guidance is invaluable to project teams, some SAs can have too much influence or be too involved in a given project and detract from the DEVELOP experience for participants. Solutions include: 1) improved communication on an individual level, and 2) establish a tracking metric to evaluate SAs at the end of the term, potentially through the participant exit evaluation, to identify situations where SAs are exercising too much control or other problems.

A potential solution would be to create a "Science Advisory Board" to serve as a formal contact group whose primary function is to enhance internode communication, with a secondary purpose of addressing any issues that arise, such as those detailed above. This could dramatically assist teams whose immediate designated SAs are not particularly knowledgeable on a specific project topic or are otherwise unavailable.

National Program Office

Contributors: Nathan Owen, Jordan Bates, Peter Hawman

What's Working

The National Program Office (NPO) does well in responding to emails efficiently and quickly, being approachable, open-minded and receptive to critique and new idea generation, and conducting site visits to enhance the DEVELOP experience for participants. These activities

reflect the NPO's consideration for its participants, an agile program structure, the program's efficiency and betterment, and engagement of all facets of DEVELOP.

What's Not Working & Potential Solutions

To provide better professional development to CLs and ACLs, there is a need for a feedback system from NPO. Currently, the only feedback that CLs/ACLs get is from term evaluations by the participants. Often, in these cases, the participants are not willing to give "critical feedback." Similar to yearly reviews of Associates and YPs, there should be a review process for CLs/ACLs where NPO can give suggestions for improvement to build the professional skills of the person. This could be done on a term basis, likely during interims after a term has concluded. Associates could be included in the review process for input since they work more closely with the deliverables coming out of the nodes.

The recently initiated Project Strength Index (PSI) assessments allow NPO to track progress of the project portfolio, but have not been shared with nodes, nor has feedback regarding project outcomes been returned to teams. Presently the only feedback received is from partner organizations after project hand-offs, meaning that some nodes can feel unsure about their success. The proposed solution is to share PSI scores with CLs to allow teams to look back and understand the strengths and weaknesses of each project.

It would benefit participants if they had more interaction with the NPO and YPs, as many do not ever meet anyone from the NPO or YP Class. Organizing virtual welcomes (when an in-person site visit isn't possible) with each node would increase participants feeling of involvement and gain insight into DEVELOP. Increasing awareness of YP initiatives will benefit project activity, and having YPs follow up with teams will help maintain open communication lines.

Additional support is needed in the area of Geoinformatics. The creation of a new Associate or post doc position that could lead the Geoinformatics Team. This new position would take over some of the responsibilities that the National Science Advisor has adopted, freeing time to focus more attention on advising. The Geoinformatics Associate would coordinate technology and lead project data archiving and metadata standards, consult teams on NASA EO sensors and platforms available for use, implement new technologies to better the program, and lead the Geoinformatics Team.

DEVELOP is prized for its ability to produce products within a short 10-week period and because of this, time is a valuable asset. Evaluation of the national telecon, its use, value, frequency, and topics would be beneficial.

Policies & Procedures

Contributors: Beth Brumbaugh, Amber Brooks, Tiffani Miller

What's Working

DEVELOP's signature dress code was the first thing discussed as something that is working. Attendees agreed that dressing professionally sets DEVELOPers apart from the others at our nodes and at events that we attend. It was also discussed that sharing the purpose of the dress code would be helpful for new participants. Many attendees also expressed appreciation for the travel logistics emails they received before the trip. It was helpful for them to know when others would be arriving and leaving, where everyone was staying, and what the per diem rate is in Hampton. The handbook is also working for DEVELOP. Most of the information that participants need to be successful is included in the handbook. The handbook includes policies and procedures, recommended timelines, and additional resources. The one additional point made here was that many participants do not seem to be reading the handbook. It was

recommended that CLs remind them to read it during the second week, after the busyness of orientation has finished.

What's Not Working & Potential Solutions

The program application and applicant selection processes were reviewed, and four key areas for improvement were noted and solutions identified: 1) applications within the online system should be available for review without having to have multiple tabs open to reference application materials during interview session, 2) integrate an "auto-save" function into the online application user interface to aid applicants when the session times out, preventing loss of previously input information, 3) provide access to Letters of Recommendation (within the online system) during the interview process to aid in applicant selection, and 4) evaluate more detailed trends in applicants, such as the types of students that are applying to the program. Solutions include downloading applications as a PDF and permanently deleting once the interview has concluded and shifting the application window to provide more time for nodes to interview and make selections. Lastly, an analysis of applicant trends may provide insight to potential changes in the amount of hours designated for full-time and part-time program participants.

It was requested that a standardized guide for using non-federal agency produced images and videos be compiled and distributed to all participants. In response to this feedback, the Communications Team has compiled the general guidelines that have been received from the legal division regarding images and clips used in presentations and in the virtual poster sessions. Publicizing links to federal agency (public domain) imagery archives and suggested methods of citation were also requested and will be distributed to all participants.

Given the quantity of projects during a term and the length and depth of deliverables, it is inevitable that the turnaround time for edits from the Project Coordination Team can be relatively long in the context of a ten-week project. It was requested that communication about the status of edits be more robust, so teams can better anticipate and address any edits before final submission. Edits will also be returned on a rolling basis, so that once all of the edits are complete for a node, they are sent back (this is in comparison to previous attempts to return edits to all teams simultaneously).

It was requested that program orientation and additional materials be publicized as "modular" for node management to utilize in a modular fashion. For example, an additional module may cover "Research Ethics and Code of Conduct". This module would be in addition to the general "Research Ethics" overview slide in the program orientation PowerPoint distributed for mandatory use at program nodes. Additionally, nodes have been encouraged to share any orientation materials they utilize with NPO for possible integration as an orientation module for use by other nodes.

Concerns were brought up about participants' status as independent consultants, including length of positions, tax code, and the amount of taxes paid. The two funding mechanisms that DEVELOP utilizes determined that based on the highly transitional structure of the program and other factors, DEVELOP participants will be funded as consultants. Therefore, DEVELOP follows the funding mechanisms' determination for setting up participants for payment. DEVELOP NPO will revisit this topic with Wise and SSAI to see if their determination remains the same as before.

Projects

Contributors: Christine Rains, Leigh Sinclair, Lance Watkins

What's Working

DEVELOP projects accomplish a tremendous amount in only 10 weeks. The DEVELOP project model supports engagement of partners, a foundation of shared characteristics, team-based research, participant ownership, the creation of a high quality set of deliverables, and an amazing DEVELOP participant experience. Projects benefit partners by enhancing their decision making processes and increasing awareness and access to Earth observations. The ability to extend the project model for up to three terms when appropriate is key in taking important projects to the next level. Participants are given the opportunity to create deliverables to improve scientific writing and communication skills, work on interdisciplinary teams, gain additional skills and experience in GIS and Remote Sensing, increase their awareness and access to Earth observations, and network.

What's Not Working & Potential Solutions

The majority of DEVELOP projects have solid relationships with their end-users. However, some projects lose partners or end-users in the middle of a term. This could be due to the POC's becoming too busy or a lack of communication with between the team and the POC. It might help to have a list of expectations for partners when they are first engaged. This would set realistic expectations from the get-go. Giving POC's weekly or bi-weekly updates about the project would also maintain their personal involvement in the project. Once a project is completed, the End-User Exit Evaluation is designed to help track how well a project fulfilled the goal of increasing end-users' knowledge of and use of NASA data. However, few end-users reply to the request for information. A proposed solution is to send out the End-User Exit Evaluation sooner, while the project is still fresh in the end-user's mind.

Although most projects result in a strong application, some projects are weak in this area. Project Strength Index (PSI) scores can help identify weak projects quantitatively. The PSI can also serve a formative role by providing teams with a set of standards for partner engagement. Thus, adding PSI score information to orientation slides will give teams a goal for final implementation at the beginning of each term. Even with successful projects, however, it is still not clear how to transfer materials to the next level in ASP. This is an area that needs more thought and consideration.

The deliverable schedule is very challenging for teams during any term, but this is especially true during the fall and spring terms when participants work fewer hours, and working on deliverables takes time away from the production of final results. One way to resolve this would be to have smaller-scoped projects for those terms. Alternatively, DEVELOP might consider extending those terms from ten to twelve weeks. Another issue concerning deliverables is the long turn-around time of edits. This has particularly been a concern because most deliverables include the abstract, and getting timely feedback on the abstract is important. The abstract is also constantly changing, but current methods for editing don't reflect this. Making the abstract a separate deliverable could help. The shortened hours in fall and spring also affects video production. Replacing the videos with podcasts could relieve some stress during those terms and should be assessed as a possible alternative.

When creating the project proposals, there needs to be improved support and guidance for the Center Leads, especially new CLs. Project proposal content is often sent to end-users and/or participants prior to the beginning of the term. The format should be adjusted in these cases, rather than sending out the proposal as it was written. For participants, the project can be re-phrased as a "research question" and sent with the background and objective information to prepare them for the term. Having a repository for past projects and project ideas will create a space in which participants can visit "future work" sections for project ideas. This could compliment the current document on project proposals which would be of great help to new Center Leads.

There are a few places where our technical capacity and data use can be improved. As we continue to work with more data, the need for increased CPU RAM has arisen. Depending on the node, NPO may be able to address issues.

Another concern is the preponderance of Landsat- and MODIS-based projects. Our dedication to innovation suggests that we should be exploring other sensors more thoroughly; underutilized and new sensors, such as Suomi NPP, and prototypical sources such as SMAP and HYSPIRI, provide excellent opportunities for DEVELOP to showcase innovation.

Field work could provide an exciting and robust way to assess and improve the accuracy of some projects' methods. One suggestion is that projects with field work components could compete for NPO-funds, which would be awarded to efforts that are essential to a project's success. One downside to consider is that, as consultants, participants would not be covered by workers' compensation, and would participate in fieldwork at their own risk.

Nodes

Contributors: Ross Reahard, Daniel Jensen, Beth Brumbaugh

What's Working

DEVELOP benefits greatly from the diversity of its many nodes, with a wide range of regional locations in addition to six NASA centers across the country. The program is comprised of students, recent graduates and transitioning professionals with diverse backgrounds. Each node's individual character thus serves to expand DEVELOP's reach, relationships, and the breadth of its applications. Within DEVELOP's organization itself, another valuable dynamic that benefits the nodes is the collaboration between Center Leads, Young Professionals, and Associates. The semi-permanent nature of the YP and Associate positions (year-long contracts), as well as the positions being housed within both the NPO and the nodes, fosters communication and collaboration throughout DEVELOP. Similarly, the communication, materials, and guidelines provided by the NPO are meant as a helpful resource for CLs and YPs. This assistance allows CLs to more effectively manage their node's organization and projects; the close ties between each YP element and the NPO helps guide the YP work and objectives.

What's Not Working & Potential Solutions

The DEVELOP Summer Lecture Series, the goal of which was to use video conferencing to broadcast seminars on scientific and professional development topics to all DEVELOP locations, was first conducted during the 2014 summer term. Several issues were identified, including: technical issues related to engaging all nodes simultaneously in a seminar, and an overall format that resulted in some participants being unengaged or under-engaged. Solutions include a more diverse range of speakers and programs presented, more talks focused on topic-specific or related to an individual's experience, utilize ARSET trainings as an alternative to technical-heavy lectures, focus on professional development and experiential speakers, engage speakers from across the DEVELOP nodes, and provide technical briefings or trainings by a different method.

While the diversity amongst the various nodes is beneficial to the program, the level of collaboration and unity between each node and their connections to the others can be made stronger to produce more robust projects and relationships. There is currently little contact between many of the nodes themselves outside of the national teleconferences, and even that offers little to no room for collaboration and discussion amongst participants. Offering another platform for participants to run ideas past each other, help solve each other's problems, and build relationships would greatly benefit many teams' projects and help make DEVELOP a more

cohesive national program. This could be done by making the national teleconference itself more discursive and opening up more time for the presentation of participants' issues. Enabling participants to communicate and offer each other solutions from any node would greatly benefit the overall quality of the projects and tie nodes together.

DEVELOP would benefit from standardization of policies and procedures for when and where to open a new node or close an existing node. In the past, the process for opening a node has been ad hoc and driven by champions of the program. The closing or graduating of nodes has similarly been on a case-by-case basis, rather than using a fixed set of guidelines or rubric for evaluation of a node's performance or potential. Specifically, there is a strong desire for more transparency in the processes, a rubric to review node progress, and a formalized process to close and open nodes. These qualities and tools would help DEVELOP keenly assess each node's strengths and weaknesses, helping the program to make more informed decisions concerning node administration. This could in turn strengthen each node's capacity building capabilities by focusing resources where they are most needed.

Miscellaneous

Contributors: Amberle Keith, Tiffani Miller, Merna Saad

What's Working

DEVELOP exudes quality in many facets of the program. Passion is seen on all levels by the way people work with high levels of enthusiasm, excitement, energy and excellence. Participants who have the determination to create products quickly and efficiently while striving for excellence, are an excellent reflection of DEVELOP's core values. The fast paced nature of the program is beneficial to completing high-risk research projects within 10 weeks. Along with the enthusiasm from the participants and the NPO, DEVELOP creates an exciting work environment in which people enjoy learning.

What's Not Working & Potential Solutions

In 2014, the number of volunteers has increased greatly compared to previous years. This was one of the results as DEVELOP started to engage military personnel in collaboration with Langley Air Force Base. Some of the issues DEVELOP has struggled with as volunteer engagement started are: inadequate recognition, limited contribution and/or involvement in the project, uncertainty in how to acknowledge on deliverables, and difficulty in distinguishing their roles within the team compared to others. Potential solutions include: 1) DEVELOP must find a niche role for volunteers that would distinguish them from others, 2) clarify and identify volunteer roles clearly and discuss with all team members to help facilitate collaboration and communication within team members as well as a sense of respect with sensitivity, and 3) communicate across all nodes through the orientation, 4) recognize volunteers the same way as any participant, 5) issue a completion certificate to all volunteers, and 6) acknowledge volunteers on all project deliverables.

DEVELOP has recently begun looking into the possibility of creating a micro-journal. NPO has been in communication with a representative from Elsevier regarding the various options they provide. This micro-journal would provide a publication venue for the large number of DEVELOP projects that are high quality, but not quite at the peer-review level. There are two options that have been made available to DEVELOP, and both were described to retreat attendees. NPO will discuss both options and make a decision soon.

DEVELOPedia

Currently, the DEVELOP Program uses various locations to store project deliverables, templates, surveys, and important documents with little to no inter-node interaction. With the creation of

DEVELOPedia, this offers the Program a chance to have a central location to obtain these items as well as a number of other features. The website enables personnel a chance to quickly access scripts, satellite and sensor information, DEVELOP materials such as the handbook, and project and personnel information. DEVELOPedia will help promote interaction between nodes and teams in that it offers participants a way to see who is working on a similar project, using a particular script or model, or even the same satellite data. In the event of a problem, the participants can collaborate to solve the issue. The site will offer teams a place to archive spatial data, such as metadata, for previous and current projects. By having easily accessible metadata, this can help document the purpose, quality, the layers' attributes, etc. for the project. This new site will need to have quality control or people overseeing it to ensure that material does not become redundant or that there are no failures in integrity. To address these issues, it has been proposed that the center leads monitor their own nodes so that as material from their location is added to DEVELOPedia, that it is compliant with the site's standards. It has also been suggested that each YP group can help oversee the pages related to their own team. In addition, certain features could require administrative privileges, such as changing file names, so as to maintain the integrity of the documents. Future additions might include a general user account which would not have editing privileges.

Looking Forward

The FY15 DEVELOP Strategic Planning & Leadership Retreat provided an opportunity for the Program to review progress, initiate new leadership team members, assess programmatic efficiencies and deficiencies, and brainstorm solutions for improving DEVELOP. With 2015 being a pivotal year for the Applied Sciences and Capacity Building Program's strategic planning, the DEVELOP Team took the mindset that this retreat was focused on the appraisal of activities and minor course-corrections. The findings of this retreat discussion will combine with the finalized ASP and CBP strategies to feed the FY16 DEVELOP Strategic Planning & Leadership Retreat where larger-scale changes will be made to refine DEVELOP through a new strategic plan.

Nest Steps

The **National Team** will:

- Finalize and implement the new mission, vision and core values.
- Participate in the launch, establishment and content population of DEVELOPedia, which will serve as DEVELOP's new project archive and communication tool.
- Increase inter-node collaboration and communication.
- Foster Center Lead collaboration and communication to support increased input into the DEVELOP model.

The **Young Professional Class** will continue activity on initiatives listed in this document, continuing progress based on described action items:

- Project Coordination
 1. Complete the project tracking spreadsheet.
 2. Create unique project tracking identification numbers.
 3. Formalize partner type definitions and distribute to the national team.
 4. Complete the partner tracking spreadsheet by populating all previous terms and projects for which materials exist.
 5. Standardize pre-project partner capability and needs assessments.
 6. Formalize the post-project exit evaluation.
 7. Collect previous impact maps and materials and make a comprehensive time series.
 8. Create maps focused on specific ASP National Application Areas.
 9. Share the PSI rubric with all incoming participants.

10. Create individualized PSI reports for each node following submission of PSI scores.
 11. Increase use of PSI results in other facets of DEVELOP (ex. annual report highlight selection).
 12. Streamline the deliverable review process so that the turnaround time back to teams is shorter.
 13. Create a standard review checklist to ensure consistent review practices.
 14. Streamline deliverables so that the abstract is only submitted and "living" in one deliverable until the end when it can be inserted into all others.
 15. Create/distribute guidelines for deliverable creation to improve knowledge of what's expected, best practices, and what not to do.
 16. Ensure review of VPS content is streamlined and supports all Earthzine deadlines.
 17. Continue to submit project archive materials and information.
 18. Brainstorm processes within project coordination that could be streamlined or improved in DEVELOPEdia.
- Geoinformatics
 1. Work with Impact Analysis Team to improve the Participant Skill Evaluation.
 2. Incorporate the evaluation into participant entrance and exit assessments.
 3. Clarify types of project deliverables requiring software release approval.
 4. Create a procedural framework to allow prompt support for teams to complete software release requirements in the 10-week timeline, taking into consideration Center Lead involvement without placing undue burden on them.
 5. Document use protocol and structure of the DEVELOP Python Module for future use by participants and management hand-off.
 6. Create email alerts to distribute to Geoinformatics Team when a help ticket is created within DEVELOPEdia.
 7. Continue to enhance functionality, prioritizing Landsat, then TRMM/GPM and other precipitation data sources.
 8. Connect with NASA's Github managers at Ames to discuss hosting the public Git for dnppy in conjunction with other NASA Open Source Approved Projects.
 9. Gain social media account approval for NASA DEVELOP GitHub (pending).
 10. Document use protocol and structure of DEVELOP code repository for continued use.
 11. Distribute access and use information to all program nodes when the repositories come online for download access and/or contribution to scripting projects.
 12. Evaluate alternatives to Google Map Gallery and ArcGIS Online for sharing DEVELOP project results.
 13. Transition all content out of the Google Map Engine by the end of 2015.
 14. Assess cost for obtaining DEVELOP AGOL account on a national scale.
 15. Explore potential sponsorship through Esri Education Services for AGOL account.
 16. Create extensive tutorials (video/documents) to guide use of dnppy, and to guide Python programming as a whole.
 17. Integrate tutorials into DEVELOPEdia, but also allow them to function well as a stand-alone resource for users outside the DEVELOP program.
 18. Create tutorials or link to external ones in a well-organized manner by topic: obtaining data, data processing and analysis in ArcGIS, data processing and analysis in ENVI, using specific common tools such as SWAT or MGET
 - Communications
 1. Promote the creation of high-quality VPS videos.
 2. Clarify the audience and level of professionalism required for the VPS.
 3. As some teams do not have the software or equipment required to make high-quality videos, assess how DEVELOP could purchase a floating software license or provide a kit of proper equipment.

4. Increase emphasis on the VPS not only during the summer term, but in the fall and spring terms through enhanced messaging to teams.
 5. Provide a canned script or template (style guide, typography suggestions, best practices) for projects that cannot invest as much time/energy into the VPS, or do not have the skills to do so.
 6. Evaluate VPS rubric and amendments needed with a focus on clarity and objectivity.
 7. Work with Earthzine and Livefyre to correct issues regarding comments not posting.
 8. Promote teams commenting on other teams' projects, but take away scoring emphasis.
 9. Have each node nominate a VPS judge (not presently active in DEVELOP).
 10. Return VPS judging process to a two-tier system as was done in previous years.
 11. Encourage more DEVELOP participants to create podcasts.
 12. Evaluate a podcast distribution schedule (potentially monthly).
 13. Assess the purchase of a podcast kit that could be transferred between nodes when a team doesn't have proper equipment to create a high quality podcast at their location.
 14. Improve understanding of the audience and purpose of the DEVELOPer Newsletter.
 15. Assess cutting stories or articles and focusing on solely highlights and conferences.
 16. Gauge how DEVELOP participants feel about the newsletter.
 17. Evaluate starting a newsletter photo contest.
 18. Compile publication tips and guidelines into a short summary report and distribute.
 19. Use Scopus to review the Impact Factor and H-index of a paper.
 20. Re-engage with previous publication venues and reach out to new publication venues.
 21. Increase publication numbers for 2015.
 22. Consider the creation of a DEVELOP micro-journal.
 23. Utilize video conferencing between nodes more often.
 24. Increase use of the node "buddy system" for more effective communication.
 25. Pair up returning DEVELOP participants with first-term participants.
 26. Utilize the 'Flat Stanley' or photo contest as friendly competition among nodes.
 27. Promote communication among nodes on DEVELOPedia.
- Impact Analysis
 1. Work with GeoInformatics Team to incorporate the Participant Skill Evaluation.
 2. Extend the evaluation to all participants at all nodes.
 3. Compile FY2014 Indicator Tracking Metrics.
 4. Complete and send out new tracking metrics workbook and help guide for FY2015.
 5. Refine Alumni Survey questions and increase response rate.
 6. Encourage DEVELOP participants to become involved to meet Equal Futures milestones.
 7. Track quantity of women in DEVELOP leadership roles.
 8. Engage with female-oriented student groups at universities.
 9. Compile FY2014 results & indicators.
 10. Assist with identifying indicators that are shared across all CBP elements.
 11. Work with Project Coordination Team to refine questions for partner needs assessments.
 12. Assess suitable projects for further analysis and contact partner organizations to discuss their use of project results.

The **National Program Office** will:

- Review and evaluate incubator talk ideas, select top ideas, and implement.
- Assess problems and solutions discussed in each of the eight areas, evaluate solutions and implement those deemed most impactful.
- Assist the YP Class with all action items.
- Assess the YP Class titles and potential leadership structure changes.
- Assess and redefine the structure of the Center Lead position and selection process.
- Conduct virtual and/or in-person welcomes with every node each term.
- Refine and disseminate strategy for military engagement.
- Provide more feedback to nodes regarding projects and node progress.
- Assess the NPO structure and gaps that can be bolstered.
- Further define and support Science Advisors and Mentors to improve engagement with project teams.

FY16 DEVELOP Strategic Planning & Leadership Retreat

The FY16 Retreat will focus on the creation of a new strategic plan using a combination of this retreat's finding and the upcoming ASP & CBP strategic plan as a foundation for strategic direction. It will also potentially be extended in length to allow more time for engagement and team building activities.