

NASA Earth Science Division
Applied Science Program
SWOT Mission

SWOT Early Adopters Guide

March 2018

Edited by:

Margaret Srinivasan¹, Craig Peterson², Alice Andral³, SWOT Applications Working Group members

¹ Jet Propulsion Laboratory, California Institute of Technology, ² NASA Stennis Space Center, ³ CNES



swot.jpl.nasa.gov/applications

SWOT Early Adopter Program Guide

Responsible persons: Margaret Srinivasan, SWOT Applied Sciences Deputy Program Applications Lead (DPA), and Alice Andral, CNES SWOT Applications Lead

DEFINITIONS:

Applications are defined as innovative uses and integration of future SWOT data products and simulated SWOT data products in decision-making activities and operational activities for societal benefit. This may include, but is not limited to, the use of future SWOT data in modeling, forecasting and/or operational activities.

Applied research will provide fundamental knowledge of how SWOT data products would be scaled and integrated into users' policy, business and management activities to improve decision-making efforts.

Early Adopters (EAs) are a subset of users who have a direct or clearly defined use for future SWOT-like lake, reservoir, and river levels and sea surface height and other ocean data, and who are planning to apply their own resources (funding, personnel, facilities, etc.) to demonstrate the utility of SWOT data for their particular system, model or application.

SWOT Applications Working Group (SAWG) is a group comprised of the SWOT Applications Coordinators, SWOT science team members, project personnel, and representatives from key user communities who come together to coordinate and organize efforts to promote the use of SWOT simulated datasets for current and future applications, and to identify and reach out to and educate potential user communities about the utility and accessibility to future SWOT data.

Users include individuals or groups in the public or private sectors who may have specific uses for future SWOT data for applications at local to global scales.

PROGRAM DESCRIPTION:

The goal of the SWOT Early Adopter program is

- 1) to expand the user communities with tangible and potential applications that would benefit from the use of SWOT data sets,
- 2) to facilitate feedback on SWOT data products *pre-launch*, and
- 3) to accelerate the use and integration of SWOT products into applications *post-launch* by providing specific support to Early Adopters who commit to engage in pre-launch applied research.

This is a non-funded activity (for NASA) for projects to be completed with quantitative metrics prior to launch.

Potential Early Adopters may review the SWOT Applications Plan (available at <http://swot.jpl.nasa.gov/applications/>) for relevant information on the proposed SWOT mission objectives, applications focus areas, the SWOT Applications Working Group (SAWG) members, and more. Additional information about the mission and science objectives may be found at the following links;

- SWOT web site; <http://swot.jpl.nasa.gov>
- SWOT Science web page; science objectives, science plan, and ST; <https://swot.jpl.nasa.gov/science/>
- AVISO+ website; <http://www.aviso.altimetry.fr/en/home.html>

In order to optimize efforts, we will concentrate on following focus areas of relevant applications;

SWOT Applications Focus Areas

- Hydrology:
 - Water governance (transboundary river) and estuaries management
 - Developing world water problems (water supply, drinking water, health)
 - Food security (flooding & drought) risk management
 - Reservoir storage and water management (energy, agriculture, civil engineering)
 - Transport
- Oceanography:
 - Coastal circulation, coastal erosion
 - Marine operations, open ocean issues
 - Fisheries
- Climate and Weather forecast:
 - Regional capabilities
 - Coastal impacts
 - Agricultural impacts

Early Adopters agree to:

- 1) Engage in pre-launch research that will enable integration of SWOT data after launch in their application as described in The SWOT Early Adopter Plan and project description form (provided during an Early Adopter *invitation to participate* period);
- 2) Complete the project with quantitative metrics prior to launch;
- 3) Actively participate in SWOT Applications Team¹ discussions and activities regarding utility of SWOT mission data products related to their application needs; and by taking lead roles in SWOT applications research, meetings, workshops, and related activities.

¹ The SWOT Applications Team currently includes the SWOT Applications Scientists, SWOT Applications Working Group Chairs, SWOT Science Team Leads, SWOT Project Scientist, SWOT Project Manager, NASA Headquarters Applied Sciences Program Manager, NASA Headquarters Program Scientist, CNES SWOT Applications leads and scientists, and the SWOT Applications Working Group.

The SWOT Applications Team agrees to:

- 1) Provide information to the SWOT Project to facilitate incorporation of Early Adopters contributions into mission reporting and information dissemination;
- 2) Provide Early Adopters with images or visual representations of SWOT data via the PO.DAAC; and/or
- 3) Provide Early Adopters with planned pre-launch calibration and validation (cal/val) data from SWOT field campaigns, modeling, and synergistic studies, and access to data simulators as available and appropriate.

APPLICATION PROCESS:

Prospective Early Adopters may request nomination to the SWOT Early Adopters Program from a SAWG member (See <http://swot.jpl.nasa.gov/applications/>). The opportunity may also be sent to relevant email listserves. Invitations to participate will typically be made semi-annually, at a minimum. The time between invitation and submission deadline is typically two months.

Nomination:

Prospective Early Adopters fill out the *SWOT Early Adopter Plan (EAP)* and Activity Description form to provide a summary of proposed project and activities. This form includes a description of the applied research, is submitted to the Applications Leads of the SAWG, and includes the following information:

1. Title of Early Adopter application and Contact information;
2. Name of ST member affiliate (*see [SWOT Science Team](#) member or members*). *Please confirm with this person in advance or contact the SWOT Applications Team Leads for information. Contact a SWOT Applications Team member with questions.*
3. Description of system or model, including data currently used and ancillary data needs;
4. Approach to solve basic challenges in applying SWOT products and/or to move SWOT products into routine operations;
5. Foreseeable requirements for pre-launch simulated data products and plans for field experiment demonstration;
6. Milestones and quantitative metrics that will assess impacts of SWOT products on the application during the pre-launch phase; and
7. Post-launch implementation strategy (if any).

SELECTION

Selections are made by members of the SAWG, NASA and CNES SWOT Project personnel, and the SWOT Project Science Leads. The selection criteria include;

- Strength of end-user connection,
- Potential for reaching ARL Level 7-9 post-launch (see <http://www.nasa.gov/sites/default/files/files/ExpandedARLDefinitions4813.pdf>),
- High chance of success,
- Reasonable and justifiable metrics,
- High impact application,
- Appropriate understanding of SWOT and how it can support the project.

The desired topics of accepted Early Adopter proposals would cover

- Diverse topics and societal needs
- Diverse SWOT products
- Diverse geography

The SAWG Chairs will create a summary table of the EAPs, and distribute them to a selection committee. The SAWG reviews proposals, communicates the findings with Project and Science Leads, and makes a collective decision. The process is confidential until the selections are announced.

Announcing selections:

After selection of EA projects, the SAWG Chairs will notify all EA invitation respondents. The SAWG will summarize the findings into a report and provide the information to the appropriate NASA and CNES Applications Program Managers. At that time, the table of Early Adopters, affiliations, titles, and SWOT ST contacts is posted on the SWOT website. This happens within approximately one month of the decision.

CONTACT WITH EAs:

After the invitation is sent, the SAWG Chairs review each EAP and work with the prospective EA to finalize the Description of Proposed Activities to the mutual agreement of the PI and the SAWG Chairs. The SAWG Chairs sign and return to the document to the successful EA applicants.

The SWOT ST contact assigned to each new EA are expected to:

- 1) Support the EA in getting access to and resolving issues with SWOT pre-launch data sets;
- 2) Facilitate EA research and receive and report feedback to the SWOT project on research metrics;
- 3) Report on EA successes, challenges and progress during SWOT ST meetings (in person when possible, or by proxy); and
- 4) Attend regular conference calls with all EA and the SAWG. This will be a chance for feedback from EA and updates on their research.

The SWOT Data Scientist is available for questions on data products, and can direct questions on algorithms to the appropriate resource. The SAWG Chairs are responsible for encouraging frequent and productive communications between EAs and their SWOT Science Team contacts.

SWOT Early Adopter program is integrated with SAWG activities and is carried out mainly through emails, telecons, workshops, tutorials and focus sessions organized by the SAWG. The SAWG also takes advantage of member attendance at conferences such as AGU, IGARSS, etc. to meet in person when possible.

SWOT Applications activities; Workshops and Tutorials are designed for large, broad attendances. Focus Sessions are designed for small thematic groups:

- **SWOT Applications Workshop:** A workshop is set up yearly or every two years and provides feedback to the NASA and CNES SWOT Mission about SWOT product applications. The workshop is designed to give an update of the mission to the community and to provide information about SWOT hydrology and oceanography data products on a broad scale. Users and Early Adopters are included in the program to provide examples of SWOT Applications. Workshops are held on-site (e.g., at NASA, other U.S. government facilities, CNES, AVISO), open to everyone, and organized by the SAWG and SWOT Applications Scientists. Reports are posted on the SWOT website.
- **NASA Applications Tutorial:** Tutorials differ from the SWOT Applications Workshop by including multiple NASA and CNES missions. Tutorials are designed to discuss products and applications of multiple missions and address similar and/or complementary application opportunities to leverage and combine data sets. Like workshops, tutorials may be held at partner organization facilities, are open to everyone, and are organized by the SAWG and science leads from multiple missions. Reports are posted on multiple mission websites.
- **SWOT Applications Focus Session:** Focus Sessions are generally half-day events added to already-organized meetings that have a concentration of SWOT users (such as the ST meetings, EGU, AGU, etc.). The goal is to provide user-specific support and information on SWOT products, related directly to the users' mission objectives. In this case, the users organize the event and SWOT Scientists make presentations and facilitate discussions. Action items are summarized and distributed for follow-up.