

SWOT Science Team Meeting, June 17-21, 2024

Chapel Hill, North Carolina

Background

The SWOT mission brings together communities focused on a better understanding of the world's oceans, its terrestrial surface waters, and the coastal and estuarine environments that lie in between. U.S. and French oceanographers and hydrologists and international partners have joined forces to develop this satellite mission to make the first global survey of Earth's surface water, observe the fine details of the ocean's surface topography, and measure how these water bodies change over time.

This meeting will take place in three parts. Day 1 will focus on exciting new results and the potential for future advances from SWOT, and a broad spectrum of partners will be invited to participate in person or online. On Days 2 and 3, the SWOT Project will present results of its official validation efforts and convey the current best understanding of the mission's capabilities relative to its science requirements. Days 4 and 5 will return to the Science Team Meeting portion of the agenda, with both breakout and plenary sessions.

Meanwhile, we will have two poster sessions running concurrently with the oral sessions to present science results in detail. Half of the posters, mostly focused on updates regarding science team projects, will be on Days 1 and 2. The other half of the posters, mostly focused on early career research, will be on Days 3 and 4.

Meeting Objectives

This is the first science team meeting in which the team will have had access to substantial amounts of SWOT data for long enough to conduct meaningful analyses. It is also the final meeting of the current science team and the first meeting of the incoming science team. As such, our objectives are to:

- (1) Hear the SWOT Project Team's assessment of the instrument performance and the strengths, weaknesses, and issues of the current version of the data set,
- (2) Present and discuss exciting new results that leverage SWOT data and continue the discussion of SWOT's performance for conducting scientific analysis.

SWOT Science Team Preliminary Agenda: 17-21 June 2024

Monday 17 June - Plenary

8:00-8:55 Registration/Coffee

8:55-9:00 Welcome from UNC Dean of Arts and Sciences James White

9:00-10:30 Introduction to SWOT (Moderator: Rosemary Morrow)

9:00 *Realising SWOT's potential*, Nadya Vinogradova-Shiffer

9:15 *SWOT - a novel programmatic approach leading to success*, Yannice Faugere & Delphine Leroux

9:30 *SWOT: the Scientific Journey*, Rosemary Morrow and Lee Fu

9:45 *Ocean Fine Scale Dynamics*, Tom Farrar, Francesco d'Ovidio, Gerald Dibarboure

10:00 *A first view of river discharge from SWOT*, Hind Oubanas, Colin Gleason, Paul Bates

10:15 *Lakes and Reservoirs from SWOT*, Jida Wang, Sylvain Biancamaria, Melanie Trudel

10:30 *Gravity, Bathymetry, and Seafloor Tectonics from SWOT*, David Sandwell, Yao Yu, and Gerald Dibarboure

10:45 Break

11:00-12:30 Expanding the reach of SWOT (Moderator: Tamlin Pavelsky)

11:00 *SWOT and Wide Swath Altimetry in the past, present, and future*, Ernesto Rodriguez

11:15 *SWOT and the Coast*, Nadia Ayoub, Marc Simard

11:30 *SWOT and the Cryosphere*, Larry Smith, Cassie Stuurman

11:45 Jack Eggleston, US Geological Survey

12:00 Pierre-Yves Le Traon: Copernicus Marine Service (remote)

12:15 Eric Tardieu, Managing Director, l'Office International de l'Eau (remote)

12:30-13:30 Lunch Break

13:30-15:00 Panel discussion with speakers (Moderators: Rosemary Morrow and Tamlin Pavelsky)

13:30 Panel 1: Surface Water from SWOT

14:15 Panel 2: Ocean Topography from SWOT

15:00 Break

15:30-17:00 SWOT Project Updates, Data Access and Tools (Moderator: Tom Farrar)

15:30 SWOT NASA/CNES Program status (N. Vinogradova Shiffer and Y. Faugere)

15:45 SWOT Project Status (P. Vaze and C. Marechal)

16:15 SWOT products and tools: PODAAC, hydroweb.next, AVISO (30 mins)

16:45 SWOT communications introduction (J. Lee) (5 mins)

16:50 Questions and Discussion

17:00 Ocean & Hydrology Poster Session: Part 1 (Science Team Posters 2023-2024 & continuity 2024+)

Tuesday June 18 - Validation Meeting (Day 1 of 2)

- 8:00 *Validation meeting objectives*, Shailen Desai/Nicolas Picot
8:15 *POD Validation*, Nicolas Picot (on behalf of POD team)
8:30 *Radiometer Validation*, Shailen Desai
8:45 *Nadir Altimeter Validation*, Matthias Raynal
9:05 *Reconstructed Attitude Validation*, Nathalie Steunou
9:15 *KaRIn Instrument Validation*, Eva Peral (presented by Curtis Chen)
9:30 *KaRIn Calibration*, Curtis Chen
9:50 **Break**
10:20 *KaRIn Data Self Consistency*, Albert Chen
10:40 *KaRIn LR Processor Validation*, Albert Chen
10:55 *KaRIn LR Global Statistical Validation*, Matthias Raynal
11:35 *KaRIn CA Crossover MASS/Lidar Validation*, Luc Lenain/Curtis Chen
12:05 **Lunch Break**
13:05 *KaRIn CA Crossover in situ Validation*, Jinbo Wang
13:25 *KaRIn LR Features/Issues*, Albert Chen
14:05 *Crossover Calibration (Operational and Reprocessing) Validation*, Matthias Raynal
14:35 *Crossover Calibration Plans for Future*, Matthias Raynal
14:50 **Break**
15:20 *KaRIn SWH Validation*, Alejandro Bohe
15:35 *KaRIn LR Data Over/Near Land*, Albert Chen
15:45 *KaRIn LR Requirements Status and Plans for Future*, Curtis Chen/Alejandro Bohe
16:00 *Project (NASA and CNES) HR Field Data Collection*, Colin Gleason, Jean-Francois Cretaux, Nicolas Picot

17:00 **Ocean & Hydrology Poster Session: Part 2 (Early Career Posters) - Tuesday & Wednesday**

Wednesday June 19 - Validation Meeting (Day 2 of 2)

- 8:00 *Hydrology Algorithm Overview and Status*, Curtis Chen/Roger Fjørtoft
8:15 *Pixel Cloud Product Validation*, Brent Williams, Roger Fjørtoft
9:00 *Pixel Cloud Product Features/Issues*, Brent Williams, Roger Fjørtoft
9:55 **Break**
10:25 *River Product WSE and Slope Validation, Features, and Issues*, Cassie Stuurman
11:15 *River Product Area Validation, Features, and Issues*, Jw De Bleser
12:00 **Lunch Break**
13:00 *Lake Product Validation*, Claire Pottier, Roger Fjørtoft
13:45 *Lake Product Features/Issues*, Claire Pottier, Roger Fjørtoft
14:25 *Raster Validation*, Alex Corben
14:40 *Raster Product Features/Issues*, Alex Corben
15:00 **Break**
15:30 *Wetland Characterization*, Tamlin Pavelsky
15:40 *Floodplain DEM Status and Plans*, Damien Desroches/Roger Fjørtoft
15:50 *HR Requirements Status and Plans for Future*, Curtis Chen/Roger Fjørtoft
16:05 *Validation Meeting Wrap-up and Plans for Future*, Shailen Desai/Nicolas Picot
16:15 Discussion

17:00 Ocean & Hydrology Poster Session: Part 2 (Early Career Posters) - Tuesday & Wednesday

Evening Event (Wednesday)

18:00-18:30 Wednesday Buses Leave from Hotels for Evening Event at Haw River Ballroom, Saxapahaw, NC

21:30-22:30 Wednesday Buses Return from Haw River Ballroom to Hotels

Thursday June 20 -

Splinter sessions

8h-9h : Coffee

Working group discussions on 3 main questions:

- Is SWOT meeting requirements, pre-launch expectations
- New results being revealed (tell Nadya/Yannice what you love about SWOT)
- Challenges remaining: steps forward

<u>Hydrology</u>	<u>Oceanography</u>
<p>09:00, <u>SWOT Lakes, Estuaries and Wetlands Group</u> (S. Biancamaria, J. Wang)</p> <p>5 min: Overview of SLeW agenda since the last ST meeting</p> <p>25 min: Cross-comparison from the WG on the performance of pre-validated HR data on lakes, reservoirs, and wetlands</p> <p>20 min: Demonstrations of new science results on lakes and wetlands produced from the available SWOT data</p> <p>30 min: Solicitation of community feedback and open discussion</p> <p>10 min: Summary of WG discussion and proposing a high-impact SLeW paper</p> <p>10:30 Morning break</p> <p>11:00, <u>Discharge Algorithm Working Group</u></p> <p>15 mins each for:</p> <ul style="list-style-type: none">• State of the DAWG (Colin Gleason)• Discharge accuracy over global gages (Steve Coss)• The SWORD of Science (Victoria McDonald, Nikki Tebaldi)• Spatial patterns of discharge (Hind Oubanas)• Future of the DAWG (Mike Durand, P-O Malaterre, K. Larnier)• Discussion	<p>9:00 - <u>high-resolution modelling</u> (B. Arbic, ...)</p> <p>15 min: Is SWOT meeting requirements, pre-launch expectations?</p> <p>15 mins: New results being revealed</p> <p>15 mins: Challenges remaining: steps forward</p> <p>9:45 - <u>Reconstruction/mapping/inversion; moderators: Shane Keating, Emmanuel Cosme</u></p> <p>10 min: Is SWOT meeting requirements? The assimilation/inversion perspective</p> <p>20 min: New results (lightning talks, nominally 1 slide, 1 minute each---participants TBC)</p> <p>15 min: Challenges ahead, discussion and future working group plans (discussion, moderator TBD)</p> <p>10:30 Morning break</p> <p>11:00, <u>Tides / internal tides</u> (E. Zaron, R. Ray, B. Arbic)</p> <p>15 mins: Introductions/Lightning presentations – a few words about your poster</p> <p>20 mins: Is SWOT meeting requirements, pre-launch expectations?</p> <p>20 mins: New results being revealed</p> <p>20 mins: Challenges remaining: steps forward</p> <p>15 min –extra discussion</p>

12:30 -13:30h : Lunch break

<p><u>Hydrology</u></p> <p>13:30 River Working Group</p> <ol style="list-style-type: none"> 1. Papa/Rodriguez: Session overview review of River Science activities since the last session (10 minutes) 2. Sherpa/Smith: SWOT observational capabilities in the CalVal phase and Arctic River preliminary results (10 minutes) 3. Fenoglio: SWOT validation activities over German rivers (10 minutes) 4. Rodriguez: SWOT observations over the Congo (10 minutes) 5. Short presentations based on 2-slides from team members not able to attend (5 minutes each): <ol style="list-style-type: none"> a. Moreira: SWOT observations over the Amazon b. Garambois et al.: river network modeling c. C. Schwatke et al.: SWOT and DAHITI 6. Review of the SWOT River Users poll results (10 minutes) 7. Open discussion of data use/quality feedback and future activities <p>15:00 Afternoon break (30 min)</p> <p>16:00 - 16:30 SWOT and Global Models (D. Lettenmaier, A. Boone)</p> <p>16:30 - 16:50 Updates on SWORD (E. Altenau, T. Pavelsky)</p> <p>16:50 - 17:10 Updates on PLD (J. Wang, C. Pottier)</p> <p>17:10 - 17:30 Planning Working Groups for Next Science Team (Discussion led by T. Pavelsky, H. Oubanas)</p>	<p><u>Deltas, Estuaries and Coastal</u></p> <p>13:30 DEC studies and validation (Simard, Ayoub, Turki)</p> <p>15:00 Afternoon break (30 min)</p> <p>15:30 Cryosphere (TBD)</p>	<p><u>Oceanography</u></p> <p>13:30 Regional Validation (J. Wang, F. d'Ovidio, P. Bonnefond)</p> <p>10 min: overview of the regional validation and AdAC</p> <p>40 min: Team speed presentation</p> <p>30 min: Discussions (existing results, gap and challenges, future plans, opportunistic campaigns)</p> <p>10 min: Summary</p> <p>15:00 Afternoon break (30 min)</p> <p>15:30 waves, wind and MSS (F. Ardhuin, D. Vandemark, D. Sandwell)</p> <p>10 min: New hybrid MSS (Isabelle Pujol)</p> <p>15 min: Plans for MSS and MSSS updates and tools (D. Sandwell) https://topex.ucsd.edu/pub/MSS_replace/</p> <p>15 min: resolved waves, opportunities and issues (F. Ardhuin)</p> <p>15 min: swell tools https://github.com/ardhuin/swellSWOT</p> <p>10 min: wind and integrated wave parameters derived from coherence, Doppler centroid ... a discussion</p> <p>17:10 - 17:30 Planning Working Groups for Next Science Team</p>
--	--	---

17:00 Ocean & Hydrology Poster Session: Part 3 (New Science Team members 2024+)

Friday June 21 - Splinter sessions

Welcome Coffee

<p><u>Hydrology</u> Data Product Evaluation</p> <p>9:00 Plan & Discussion for Next Steps on Validation Data Collection (T. Rowley, TBD)</p> <p>9:30 Refreshed results from validation method intercomparison (P. Bonnefond, T. Minear)</p> <p>9:45 Example of SWOT Data Products Over the Rhine (H. Yesou)</p> <p>10:00 SWOT Phenomenology over Wetlands (J. Fayne)</p> <p>10:15 Discussion</p> <p>10:30 Coffee</p> <p>SWOT Science Going Forward</p> <p>11:00 Cross-working group discussion of key findings & needs (T. Pavelsky, J-F. Cretaux, C. Nickles, M. Bonnema)</p> <ul style="list-style-type: none"> ● What have we learned so far about what SWOT HR data are good at scientifically? ● What are the areas we've learned have issues? ● Are there new data products we need to develop? ● Are there specific issues with existing data products that we think should be high priorities? 	<p><u>Oceanography</u></p> <p>SWOT Science going forward</p> <p><u>LR data products</u></p> <p>9:00 L3 algorithms & products : how they relate with L2 products, current status, and way forward (G. Dibarboure et al)</p> <p>9:30 Rationale and limitations of SWOT's calibration (L2 & L3) and how it may affect SWOT ocean users (G. Dibarboure et al)</p> <p>9:45 Overview of Level-4 gridded products and operational outlook (M. Ballarotta et al)</p> <p>10:15 Discussion</p> <p>10:30 Coffee</p> <p>11:00 Cross-working group discussion of key findings and needs (T. Farrar, R. Morrow, F. D'Ovidio, LL Fu)</p> <ul style="list-style-type: none"> ● What have we learned so far about SWOT LR data for science ? ● What are the areas that have issues? ● Are there new data products we need to develop? ● Can we testing inversion schemes/modelling in AdAc regional Data challenges ● Are there specific issues with existing data products that we think should be high priorities?
---	--

12:30 Lunch (60 min)

Friday June 21 - Plenary

Afternoon Plenary

13:30 SWOT Applications (C. Nickles, M. Bonnema)

13:45 Going forward with SWOT and beyond: SWOT extension (Parag) ,S3-NGT (Pierrick/Alejandro), ODYSEA (Sarah Gille) & SWOT-LOAC (Ernesto/Rosemary/Marc/Nadia)

14:15 Synthesised view on 3 main questions: (Science leads : hydrology & oceanography & coastal)

- Is SWOT meeting pre-launch expectations and scientific needs?
- New results being revealed (tell Nadya/Yannice what you love about SWOT)
- Challenges remaining : steps forward

15:00-15:30 Coffee Break

15:00 New working group on open science/software (J. Wang, S. Gille, C. Gleason, C. Germaine)

15:30 Discussion on questions/concerns arising from meeting (T. Farrar & T. Pavelsky & Science Leads)

SWOT Validation Project/Science Team summary report
SWOT Validation publications,
Future communication & meetings

16:00 End of meeting