

**SWOT 3<sup>rd</sup> Science Team Meeting 2018**  
**June 26-29, 2018**  
**Delta Hotel by Marriott, Montreal, Canada**

**Agenda**

Tuesday 26 June 2018	Wednesday 27 June 2018	Thursday 28 June 2018	Friday 29 June 2018
<b>SWOT ST Meeting - Day 1</b>	<b>SWOT ST Meeting - Day 2</b>	<b>SWOT ST Meeting - Day 3</b>	<b>SWOT ST Splinter Meetings</b>
Morning : Plenary	Morning : Ocean	Morning : Ocean	Morning : Ocean
	Morning : Hydro	Morning : Hydro	Morning : Hydro
Afternoon : Plenary	Afternoon : Ocean	Afternoon : Plenary	Afternoon : Ocean
	Afternoon : Hydro		Afternoon : Hydro
Posters	Posters & Cocktail	Posters	

**Day 1: 26 June 2018 : Morning – Plenary** (*Chair : T. Pavelsky*)

*8:00-8:30 Registration & Coffee*

8:30 Welcome & Logistics

8:40 Program status (E. Lindstrom, S. Cherchali)

9:00 Project Status (P. Vaze, T. Lafon)

9:30 Update on Layover Results (T. Pavelsky, C. Chen)

9:45 Applications Working Group (M. Srinivasan, F. Hossain, E. Beighley, A. Andral)

*10:00 Coffee*

**Plenary** (*Chair : L.L. Fu*)

10:30 Ocean Keynote Presentations:

- What spatial scales will SWOT resolve and their governing dynamics? A modeling study (25 min) (Jinbo Wang et al.)
- The status of tide modeling for SWOT (25 min) (Richard Ray and Florent Lyard)

11:20 Hydrology Keynote Presentations:

- Learning continental water fluxes from space - from hydrodynamic modeling to SWOT discharge products (25 min) (Michael Durand & Pierre-Andre Garambois)
- Hydrologic Science and Applications from SWOT in Canada (25 min) (Daniel Peters et al.)

12:10 Meeting objectives (Science Leads)

*12:30 Lunch (including Applications Working Group lunch)*

## **Day 1 : 26 June 2018 : Afternoon – Plenary** (*Chair : J.-F. Cretaux*)

### **14:00 ADT presentation, current status and tentative schedule for next year** **(N. Picot, S. Desai).**

- Science Data System Processing Overview (10 minutes) (C. Chen, N. Steunou, R. Fjortoft)
- Algorithm Theoretical Basis Documents: Status, Plans, and Schedule (10 minutes) (N. Picot, S. Desai)
- Ocean Product Status (15 minutes) (N. Steunou, S. Desai)
- Hydrology Product Status (15 minutes) (C. Pottier, J. Turk)
- Plans for SWOT Data Access (15 minutes) (S. Vannan, H. Vadon)
- Auxiliary and Ancillary Data and Models (25 minutes) (N. Picot, S. Desai)

*15:30 Coffee*

### **Afternoon – Plenary** (*Chair : R. Morrow*)

#### **16:00 Short-latency products**

- Status and expected performance (20 min) (N. Picot, S Desai)
- Discussion (10 min)

#### **16:30 Sample Data Products Status & Plan (N. Picot, S Desai)**

- Status of Hydrology Simulator (10 minutes) (B. Williams)
- Pixel Cloud Products from Large Scale Simulator (20 minutes) (D. Desroches)
- River Products from RiverObs (20 minutes) (M. Durand)
- Lake Products from LOCNES (20 minutes) (C. Pottier)
- Ocean Products from simplified simulator (20 minutes) (C. Ubelmann, L. Gaultier)

#### **18:00 – 19:00 POSTERS & Informal Discussion**

## Day 2: 27 June 2018 : Ocean Splinter Working Groups

### 9:00 Morning Session: Observation of SSH, currents at small mesoscales (J. Wang and C. Ubelmann)

1. **SSH signal in relation to ocean currents and kinetic energy (spectrum perspective), altimeter + MITgcm 2km**  
9:00 Torres Gutierrez, H et al. "On the Spectral Slope Discontinuity in Sea Surface Height Spectra"  
9:15 Vergara, O et al., "Evidence of Altimetric SSH slope changes potentially induced by IGW"
2. **Velocity measurements, ADCP, HF radar, how to connect to SSH?**  
9:30 Kachelein, L & Gille "Using harmonic analysis to detect non-stationary internal tides in the California Current System: Evaluating modulation resulting from the annual cycle in stratification"  
9:45 Gille et al. "High-wavenumber spectra from historical ADCP transits in the tropical Pacific"
3. **Glider studies, can we see anything about waves versus eddies?**  
10:00 Serazin, G et al. "S-ADCP, gliders, and thermosalinographs analysis in the tropics"  
10:15 Drushka and Rainville "Internal waves and eddies from gliders"

10:30 *Coffee*

11:00 *Session resume*

4. **Using mooring data to study the wavenumber spectra of SSH**  
11:00 Samelson et al. "Observation-based estimates of the SSH signature of the internal wave field".
5. **Big field campaigns, what can we learn from these campaigns about the in-situ measurements in the context of SWOT?**  
11:15 Farrar T/Rodriguez E "DopplerScatt"  
11:30 Lenain L and K Melville, "Broadband measurements of ocean surface topography using airborne lidar technology"  
11:45 d'Ovidio F & A Pascual. Mediterranean Sea May 2018 campaign  
12:00 James Girton, The submesoscale mixed layer eddy experiment (SMILE), connection to SSH and SWOT.

12:15 **Discussion**

12:30 *Lunch*

## Afternoon Session: High-resolution modeling and SSH reconstruction

### 14:00 High-resolution ocean general circulation models (P. Klein, B. Arbic, and J. Le Sommer)

- 14:00 E Zaron and C Rocha: Perspectives on the wave-balanced motions interactions in high-resolution OGCM (a summary of the Portland workshop).
- 14:12 J Le Sommer and A. Ajayi: Spatial and Temporal Variability of Coherent Structures in the North Atlantic in preparation for SWOT. Updates on the simulation plans with NEMO in Grenoble for 2018/2019.
- 14:24 B Arbic: Comparisons of global and regional internal wave simulations with observations and theory.
- 14:36 A Sinha, D Balwada , N Tarshish & R Abernathey : Modulation of Lateral Transport Barriers by Submesoscale Eddies and Inertia Gravity Waves
- 14:48 H Torres, P Klein, Z Su & D Menemenlis : The JPL global simulation: last results and perspectives in in terms of balanced motions and internal gravity waves.
- 15:00 R Samelson et al.: "Ocean mesoscale regime of the reduced-gravity quasi-geostrophic model."
  
- 15:12 Discussion

*15:30 Coffee*

### 16:00 Reconstruction of SSH and the upper ocean circulation (B. Qiu, G. Lapeyre, S. Gille)

*(10 mins presentations, 2 mins questions)*

- 16:00 P Heimbach, B Cornuelle, S Gille, M Mazloff, J Wang: Progress toward variational assimilation of SWOT data
- 16:12 M Benkiran, E Rémy, PY Le Traon: An Observing System Simulation Experiment to evaluate the impact of SWOT in a regional data assimilation system (10 minutes + 2 minutes questions/transition)
- 16:24 F d'Ovidio: How reliable is the omega equation for reconstructing meso- and submeso-scale vertical velocities? A model evaluation for different flow regimes (10 minutes + 2 minutes questions/transition)
- 16:36 A Ponte: Balanced/unbalanced motion disentanglement: on the relevance of SST (10 minutes + 2 minutes questions/transition)
- 16:48 B Qiu, S Chen, J. Wang, P. Klein, L. Fu: Preliminary results on reconstructing upper ocean circulation variability in the presence of unbalanced motions (10 minutes + 2 minutes questions/transition)
- 17:00 L Gomez-Navarro, R Lguensat, J Le Sommer, E Cosme: Exploring de-noising and reconstruction methods for SWOT (10 minutes + 2 minutes questions/transition)
- 17:12 Discussion

### 17:30 POSTERS, Cocktails, & Hors D'oeuvres

## Day 2 : 27 June 2017 : Hydrology Splinter

### Morning Session:

#### 9:00 Hydrology cal/val (*T. Minear, S. Calmant*)

- Summary of South America Water from Space Meeting (5 minutes) (F. Papa)
- Current pre-launch and post-launch cal/val plans led by France (15 mins) (N. Picot)
- Current pre-launch and post-launch cal/val plans led by U.S. (15 mins) (T. Minear)
- Current pre-launch and post-launch cal/val plans led by Canada (15 mins) (D. Yang)
- Discussion on Effectively Merging Plans & Key Remaining Questions (40 mins)

10:30 Coffee

#### 11:00 Pre-SWOT Hydrology Phenomenology and Science (*L. Smith, J.-F. Cretaux*)

- Recent AirSWOT Results for lakes/wetlands (15 min) (L. Pitcher)
- Recent AirSWOT Results for Rivers (15 min) (E. Altenau)
- Preliminary Ka-band returns from the 2017 ABoVE Campaign (L. Smith, J. Fayne) (20 mins)
- Advances in understanding of SWOT phenomenology (20 mins) (C. Chen)
- Discussion (20 mins)

12:30 Lunch

### Afternoon Session:

#### 14:00 A Priori Datasets & Algorithms (*Y. Sheng, T. Pavelsky*)

- A priori river dataset, updates and plans (T. Pavelsky/M. Durand) (15 mins)
- A priori lake datasets, updates and plans (C. Pottier/Y. Sheng) (15 mins)
- Progress in lake water storage algorithms (M. Queller/J.-F. Cretaux) (15 mins)
- River & lake ice flagging algorithms (T. Pavelsky) (15 mins)
- Water detection algorithms (D. Desroches) (15 mins)
- Discussion (15 mins)

15:30 Coffee

#### 16:00 Hydrology Data Products (*M. Durand, C. Pottier*)

- Pixel Cloud Data product status (B. Williams/R. Fjortoft) (20 min)
- Lake Data product status (C. Pottier) (20 min)
- River Data product status (R. Frasson) (20 min)
- Raster Data product status (T. Pavelsky) (10 min)
- Discussion (20 mins)

17h30 : POSTERS, Cocktails, & Hors D'oeuvres

## Day 3 : 28 June 2017 : Morning : Hydrology Splinter

### Morning Session 9:00 – 12:30

#### 9:00 SWOT, Hydrological and Hydrodynamical Models, and Data Assimilation I (C. David, A. Boone)

- Global flood wave travel times and SWOT data latency (G. Allen) (15 min)
- Uncertainty Quantification for River Discharge and Data Assimilation (C. David) (15 min)
- Discharge Interpolation & assimilation update (M. Pan) 15 min
- Assimilation of SWOT-like Data into ISBA-TRIP (C. Emery/S. Biancamaria) (15 min)
- River discharge and bathymetry estimation from variational assimilation of SWOT altimetry observations (K. Larnier, J. Monnier, P.-A. Garambois) (15 min)
- Discussion (15 min)

### 10:30 Coffee

#### 11:00 SWOT, Hydrological and Hydrodynamical Models, and Data Assimilation II (K. Andreadis, S. Biancamaria)

- Contribution of SWOT-like data to model lake/reservoirs in ORCHIDEE land surface model (C. Ottele, K. Petrus, A. Bernus, and S. Biancamaria) (15 min)
- Reduced model for sensitivity analysis and ensemble based data assimilation with 1D and 2D hydraulic modeling (I. Mirouze, S. Ricci) (15 min)
- Innovative methods development for the cycle-averaged lake product (Y. Sheng) (20 min)
- Status of cycle-averaged river data products (K. Andreadis) 20 min
- Discussion (20 min)

### 12:30 Lunch

## Day 3 : 28 June 2018 : Morning : Ocean Splinter

### Morning Session : 9:00 – 12:30

#### **9:00 Tides, internal tides, and internal gravity waves (R. Ray, F. Lyard, B. Arbic)**

(12 mins + 2 mins question/transition)

9:00 J Shriver, HYCOM progress and plans related to SWOT

9:14 Nelson, Non-stationarity in HYCOM internal tides (12 mins + 2 mins question/transition)

9:28 Kelly, Dependence of simulated internal tides on surface tide models, topography, and stratification (5 mins + 2 mins question/transition)

9:42 E Zaron, Progress report on high-resolution empirical internal tide models (12 mins+ 2 mins question/transition)

9:56 F Lyard, Non-hydrostatic tides and other considerations (12 mins+ 2 mins question/transition)

10:10 Discussion of topics related to implementation of models by the SWOT project

*10h30 Coffee*

#### **11:00 Post-launch in-situ campaign (Tom Farrar et al)**

11:00 Overview of session goals (T. Farrar, L.-L. Fu, R. Morrow)

11:05 Science objectives of Adopt-a-crossover effort (F. D'Ovidio)

11:20 Notional SWOT international science campaign (T. Farrar)

11:35 Programmatic approach and schedules (E Lindstrom, N Vinogradova-Shiffer)

11:45 Discussion (30 mins)

*12:30 Lunch*

## **Day 3 : Afternoon (Plenary; Chair : T. Pavelsky)**

### **14:00 Coastal/estuarine group (B. Laignel, M. Simard, P. Matte)**

14:00 Simulation and reconstruction of the coastal current off East Canada – G. Han

14:10 Hydrodynamic modeling in the Gironde estuary and over the shelf of the Bay of Biscay and of the Gulf of Tonkin – N. Ayoub

14:20 A spectral approach for investigating the spatio-temporal hydrodynamic variability and the simulator SWOT data in estuarine and coastal zones – I. Turki, B. Laignel

14:30 Questions

14:35 Water surface slope variability in deltaic regions: experimental results from airborne campaigns in the Atchafalaya Basin– M. Simard

14:45 Mapping tides from SWOT data: An assessment of regularized and constrained harmonic analysis in the St. Lawrence Estuary – P. Matte

14:55 Will SWOT cover critical deltas and estuarine regions – M. Simard

15:05 Questions

15:10 Discussion about the application of SWOT in the coastal and estuarine environments

*15:30 Coffee*

## **(Plenary; Chair : L.-L. Fu)**

### **16:00 Splinter session summaries and main results (1-2 slides)**

#### **16:00 Hydrology sessions :**

- Hydrology cal/val
- Pre-SWOT Hydrology Phenomenology and Science
- A Priori Datasets & Algorithms
- Hydrology Data Products
- SWOT, Models, and Data Assimilation

#### **16:25 Oceanography sessions :**

- Observation of SSH, currents at small mesoscales
- High-resolution ocean general circulation models
- Reconstruction of SSH and the upper ocean circulation
- Tides, internal tides, and internal gravity waves
- Post-launch in-situ campaign

### **16:50 Meeting wrap-up (Science Leads)**

*17:00 End*



## DAY 4 : 29 June 2018 : SWOT Ocean Cal/Val Splinter

### SWOT Ocean CalVal Meeting

**8:30** Introduction (C. Chen, N. Picot)

- overall calval objectives and meeting objectives
- status of the calval plan and RFAs

9:00 Status of the in-situ calval plan (L. Fu, Y. Chao, S. Desai)

- Introduction (5 min, L. Fu)
- Status, results, and plans for development of GPS buoys: Potential for SWOT insitu calval. (15 min, S. Desai)
- The Monterey Bay Experiment results: Mooring/glider dynamic height, and comparison with GPS SSH - bottom pressure (25 min, Y. Chao)
- The California site pre-launch experiment Plan (20 min, Y. Chao)
- Scenarios of the post-launch campaign (15 min, L. Fu)
- Discussion (10 min)

**10:30** *Coffee*

**11:00** Status of US lidar calval (K. Melville/L. Lenain)

- pre-launch plan and aircraft selection status (20 min)
- post-launch plan (10 min)

**11:30** Status of French lidar calval

**12:00** Discussion of the synergy of the GPS buoy array, hydrographic array, and lidar flights and the way forward (L. Fu)

**12:30** **Lunch**

#### **Fast-sampling phase calval plans at other sites**

**14:00** Bass Strait absolute SSH CalVal site (B. Legresy, 15 mins)

**14:15** Adopt a crossover

- Validation objectives and organisation (F. D'Ovidio, R. Morrow, 5 Mins)
- Tropical site (SW Pacific), (F. Marin, 10 mins)
- High latitude site (ACC south of Australia,), (B. Legresy, 10 mins)
- W Pacific proposed Chinese international site, (Yi Chao - 10 mins)
- Overview of other opportunities – 2-3 slide each (R. Morrow, 10 mins): California, Mid-Atlantic Bight/Gulf Stream, Brazil/Amazon, Labrador Sea, Agulhas, ...
- Discussion: Minimal in-situ observations needed for 3D structure (physics and biochemistry?). Dealing with unexpected slip in launch date. Extension

into nominal phase. Plans to organise the ST and international partners (F. D'Ovidio, R. Morrow)

**15:30** *Coffee*

**16:00 Additional products for Fast Sampling Phase CalVal sites (C. Ubelmann)**

for accurate local altimetric SSH - HR tides and internal tides, HR MSS, waves, colocated alongtrack altimetry, HR mapped SSH & FSLEs, HR SST/ocean colour, SAR

**16:15** Global statistical calval

- SWOT nadir altimeter and KaRIN cross-calibrations (J. Wang, L. Fu)
- synergy with the conventional altimeter constellations (G. Dibarboure et al)

**16:40** Final Discussion & forward plans

**17:00** *Adjourn*

## SWOT Hydrology Discharge Product Development Meeting

### 9:00 Introduction and Poster Session

- Agenda and goals (5 minutes). Michael Durand
- Flash talks (30 minutes): Short one or two-slide versions of posters
- 60 minutes for posters and discussion

### 10:30 Coffee

### 11:00 Background, McFLI and Introduction to Pepsi Challenge

- Discharge data products and SWOT Mission Operations. (25 minutes). Michael Durand
- On the need for discharge integrators (25 minutes). Colin Gleason
- A perspective from global modeling (20 minutes) Aaron Boone
- Variational data assimilation: Latest SiC results and potential global applicability (20 minutes). Pierre Olivier Malaterre

### 12:30 Lunch

### 14:00 Pepsi Challenge 2 Investigations

- Unpacking Pepsi Challenge 2.0 Results. Each group present their own results (40 minutes).
- Open Discussion of Pepsi Challenge 2.0 Results (25 minutes). Michael Durand
- Study rationale going forward: Defining the investigation plan (25 minutes). Pierre André Garambois & Kevin Larnier

### 15:30 Coffee

### 16:00 Next Steps and Decision Making

*Each speaker tasked with proposing one slide, presenting for only a few minutes, and encouraging discussion.*

- Pepsi Challenge: What comes next? (10 minutes) Michael Durand
- Next steps for McFLI. (10 minutes) Mark Hagemann
- Data Products: What comes next? (10 minutes) Renato Frasson
- Next steps for variational assimilation for DassFlow hierarchical (10 minutes) Pierre Andre Garambois
- Next steps for variational assimilation for SiC (10 minutes) Hind Oubanas
- Next steps for developing the SWOT consensus algorithm (10 minutes) Renato Frasson
- Next steps for integrators (10 minutes) Colin Gleason
- Wrap Up (5 minutes) Michael Durand