



Plenary Introduction

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International Surface Working Group (ISWG)

Goal: Gather requirements specific to surface observations
What are most impactful observation to define Earth system:
land, vegetation, snow, ice, and coastal and open waters

Facilitate and guide **continuity of measurements** to advance science

Communicate across agencies methods and data to achieve common objectives

Promote the science and goals for earth observation and modeling

Foster and explore new areas for research

International Surface Working Group (ISWG)

Upcoming Events	Date	Abstract Due
IUGG (Montréal, Canada)	Jul2019	Closed
ITWG (Saint-Sauveur, Québec, Canada) <i>- Present ISWG-3 outcome/progress</i>	Oct2019	Closed
IEEE PIERS (Xiamen, China) <i>- Session on GNSS-Reflectometry</i>	Nov2019	20July2019
H SAF and HEPEX joint workshop (Reading, UK) <i>- Remote sensing, hydrological modelling and assimilation</i> <i>- Hydrological data assimilation for NWP</i>	Nov2019	01Sep2019
AGU annual (San Francisco, USA)	Dec2019	31July2019
AMS annual (Boston, USA) <i>- 3rd Conference SmallSats (CYGNSS)</i> <i>- 34th Conference Hydrology (Land DA)</i>	Jan2020	01Aug2020
EARSeL Special Interest Group on Land Ice and Snow (Bern, Switzerland)	Feb2020	01Oct2019
EGU general assembly (Vienna, Austria) <i>- Remote Sensing of Soil Moisture (2019 session)</i>	May2020	15Jan2020
CGMS-48 plenary session (Xi'an, China)	May2020	N/A
IPWG joint with Workshop on Space-based Snowfall Measurement	Jun2020	TBA

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Action items:



ISWG_2018_A2: Action target the next ISWG meeting to a high latitude region with at least one session focused on snow studies and data assimilation. It was noted that studies in high latitude regions are problematic due to the sparse and difficult nature in taking measurements of many land surface parameters.

Merci Beaucoup



Environment and
Climate Change Canada

Environnement et
Changement climatique Canada

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Action items:



ISWG_2018_A1: Action to distribute and collect responses for a survey of ESM community to link requirements regarding land surface to those of EO-agencies.

Available upon request from:

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-or-

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isardSAT[®]

*Low Frequency Passive Microwave
User Requirement Consolidation
Study*

ESA ITT AO/1-8731/16/NL/IA
D-02 White paper on L-band
radiometry for earth observation:
status and achievements



THANK YOU

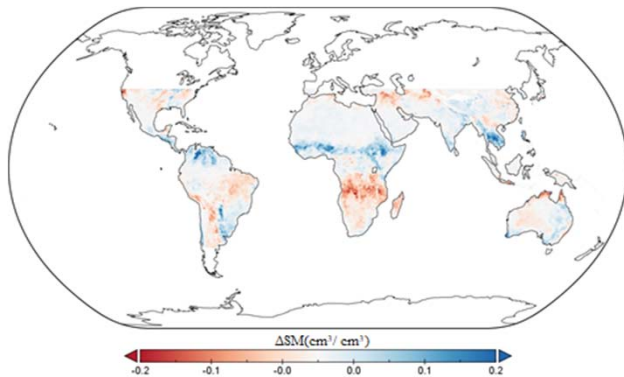
Soil Moisture Signal

(Courtesy Mohammad Al-Khaldi, Ohio State)

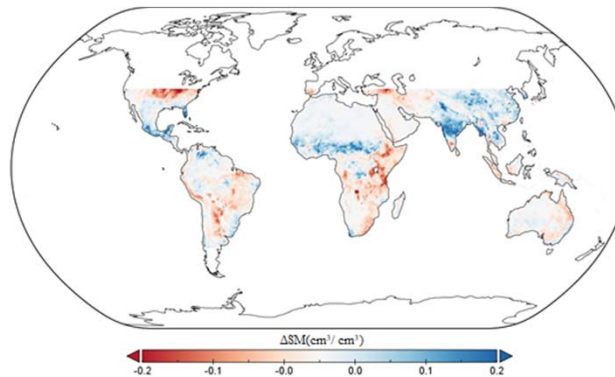


- Difference monthly mean CYGNSS signal to noise ratio over land (no soil moisture retrieval algorithm... yet) – 1 month change in SNR
- Compare with SMAP 1-month difference in soil moisture

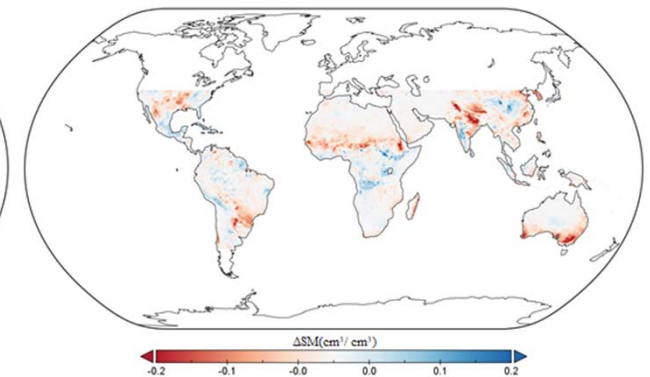
SMAP, Apr - May



SMAP, May - June



SMAP, Aug - Sept



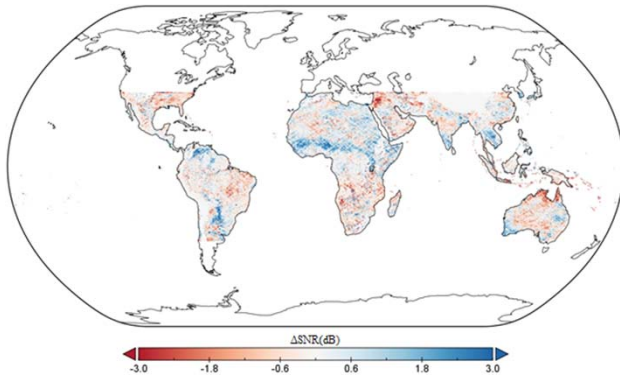
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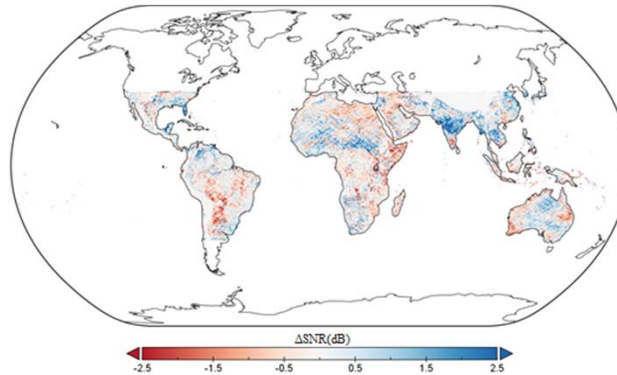


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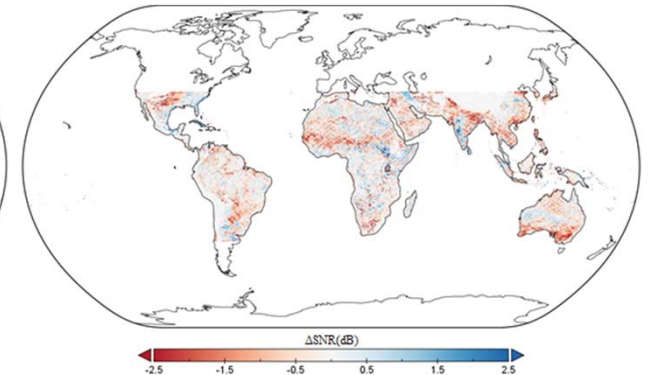
CYGNSS, Apr - May



CYGNSS, May - June



CYGNSS, Aug - Sept

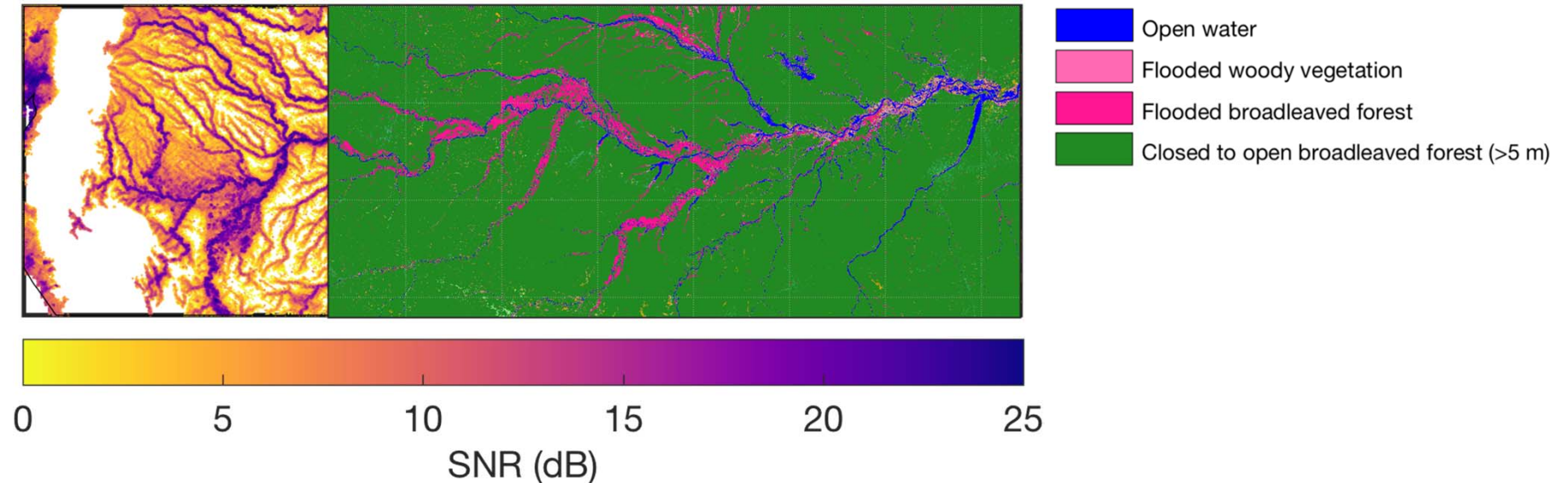


Land Surface Inundation

(Clara Chew, Talk 4.4, Tues 8 Jan, 9:15 AM)



- CYGNSS signal sensitive to surface water – examine Amazon



<https://data.cosmic.ucar.edu/gnss-r/soilMoisture/cygnss/level3/>

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Recommendations:

ISWG_2018_R1: Collection of events for validating the lead-up to and the extreme events (intense precipitation, flash flood, ...) which are well observed. Further, events will be defined by simultaneous collection of in-situ and remotely sensed observations
International Snow Moisture Network – potential resource to mine

ISWG_2018_R3: Climatology L-band, C-band, GNSS-R to be used as a baseline record for Earth System Models (ESMs) to replicate.

ISWG_2018_R5: Collection of snowfall events, show sensitivity study or information content derivation by frequencies

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Recommendations:

ISWG_2018_R2: Roadmap to address systematic errors in soil moistures, temperatures and vegetation water content between ESMs and observations.

Using case studies:

- *Define setup including model layering, a priori parameters (vegetation coverage and greenness, soil levels and moisture)*
- *Explore sensitivity of the model parameters (upper soil moisture levels, vegetation water content, leaf area, and greenness fraction) to the root zone soil moisture (remote sensing rarely provides direct measurement of the root zone soil moisture)*

Feedback from IPWG: This ISWG roadmap will benefit IPWG algorithms developers
These surface variables are used as ancillary data in many precipitation retrieval algorithms which need a good and unbiased surface characterization.

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Recommendations:

ISWG_2018_R6: Catalogue of water body extent maps. Highlight efforts to merge these maps and explore methods to combine the information

Belair (ECCC) C-Band database rapidly changing bodies

Clara Chew looked at Amazon river basin with GNSS-R

Choulga, M., Kourzeneva, E., Balsamo, G., Boussetta, S., and Wedi, N.: Upgraded global mapping ... application to surface water depth, Hydrol. Earth Syst. Sci. Discuss., <https://doi.org/10.5194/hess-2019-234>, in review, 2019.

ISWG_2018_R7: Creation of a multi-decadal climatology of LST which provides a function to fit the diurnal cycle as a baseline record for ESMs to replicate.

(Ghent, Veal and Dodd 2019) EUSTACE/GlobTemperature: Global clear-sky land surface temperature 2002-2016

ISWG_2018_R4: Provide in-situ snow observation networks and distribute via GTS.

Feedback from IPWG: Snowfall retrievals have gained in importance at IPWG

Validation data from in-situ snow observation networks is needed and this recommendation is supported by IPWG and can be added to our recommendation list as well.