



Discover & Access NASA Salinity Data

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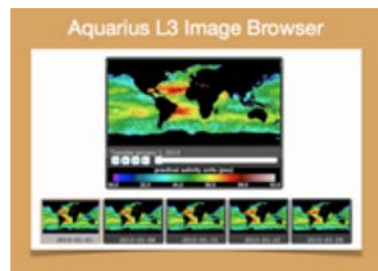
PO.DAAC Tools & Services



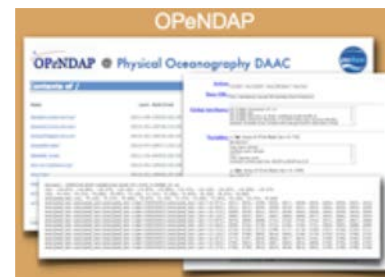
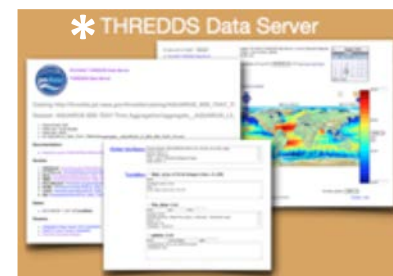
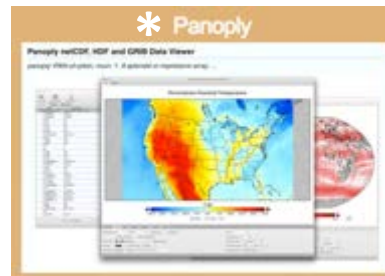
Web Portal



**Services & Tools for
Accessing & Subsetting Data**
**Also have visualization capabilities*



Visualizes Aquarius Data



**Learn more by accessing
Webinar Resources**



PO.DAAC's Mission Pages

- PO.DAAC has pages for the missions it supports
 - *Aquarius* and *SMAP* pages can be accessed through the "Missions" tab

podaac.jpl.nasa.gov

The screenshot shows the PO.DAAC website interface. At the top, there are logos for NASA, EARTHDATA, and Jet Propulsion Laboratory. A navigation menu includes 'Home', 'Dataset Discovery', 'Data Access', 'Measurements', 'Missions', 'Multimedia', 'Community', 'Forum', and 'About'. The 'Missions' tab is selected, displaying two columns: 'NASA Missions' and 'Non-NASA Missions'. The 'NASA Missions' column lists: ADEOS-II, AQUA, AQUARIUS, GRACE, GRACE-FO, MODIS, QuikSCAT, Seasat, SMAP, and TOPEX-POSEIDON. The 'Non-NASA Missions' column lists: AVHRR-Pathfinder, MetOp, and SSM/I. Red arrows point to 'AQUARIUS' and 'SMAP' in the 'NASA Missions' list. A search bar and social media links are visible at the top right.



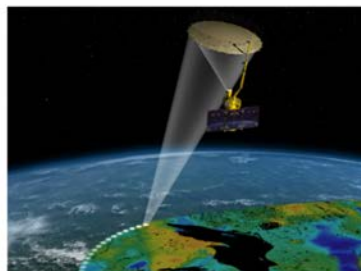
SMAP Mission Page

- Key resources are found under "Technical Documentation"
 - Users Guides
 - Release notes
 - etc.

podaac.jpl.nasa.gov/smap

Soil Moisture Active Passive (SMAP)

Mission Specification & Status



Launched on January 31, 2015, the NASA Soil Moisture Active Passive (SMAP) mission is designed to principally measure soil moisture and freeze/thaw state from space for all non-liquid water surfaces globally within the top layer of the Earth. The mission additionally provides a value-added Level 4 terrestrial carbon dataset derived from SMAP observations. The SMAP satellite is in a near-polar orbit at an inclination of 98 degrees and an altitude of 685 km. It has an ascending node time of 6 pm and is sun-synchronous. In approximately 3 days, SMAP achieves global coverage but has an exact orbit repeat cycle of 8 days. Additional information on SMAP orbital characteristics and instruments, comprised of an L-band radar sensor and highly sensitive radiometer operating at 1.41GHz, is provided adjacent. Further details on the SMAP mission are available from the NASA SMAP website and SMAP Handbook.

SMAP is now also building upon the legacy of *Aquarius/SAC-D* mission in delivering both soil moisture and derived sea surface salinity (SSS) observations for the world's oceans. With the loss of the *Aquarius* mission on June 7, 2015 it became critical also to continue the time series of global salinity observations important to studies of the earth's water cycle. Because both *Aquarius* and SMAP shared a L-band feed-horn configuration, lessons learned from the algorithm development under the *Aquarius* mission could be applied to SMAP to retrieve SSS via SMAP. However, because of the larger swath coverage, spatial resolutions under SMAP are approximately 40km instead of 100km with *Aquarius*. The increased spatial coverage provides opportunities for applying SMAP data for higher resolution studies than *Aquarius*. With the initiation of SMAP science operations and data flows in April of 2015, the approximate 3-month overlap period between SMAP and *Aquarius* also allows for inter-calibration and comparative studies.

The primary SMAP salinity products include a Level 2 orbital dataset, in which data granules contain both the ascending and descending arcs of the orbit, and two Level 3 gridded datasets: an 8-day running average product (linked to the day repeat cycle of SMAP) and a monthly product. SMAP salinity data are archived and distributed via the PODAAC. SMAP soil moisture and L4-Carbon products are available from the National Snow and Ice Data Center (NSIDC), with Level 1 SMAP radar data being distributed by the Alaska Satellite Facility (ASF). These DAACs are the official NASA repositories for the SMAP mission data.

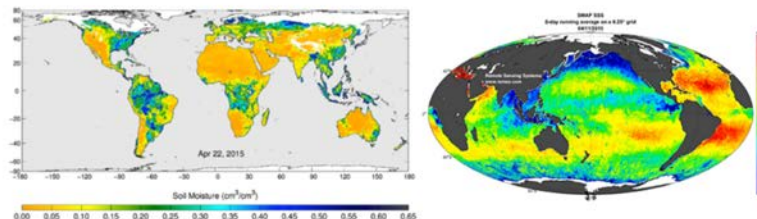


Figure 1: (Left) Global soil moisture mapped image from SMAP. (Right) Derived sea surface salinity (SSS) from SMAP (8-day running mean composite)

Data Links

- Browse SMAP Salinity Data at PO.DAAC
- SMAP Salinity Products on PO.DAAC FTP
- SMAP Soil Moisture Data at NSIDC (Level 1 Radiometer, and all L2, 3, 4 products)
- SMAP L1 Radar data at ASF

PO.DAAC Tools and Services

- FTP
- OPeNDAP
- THREDDS
- PODAAC-WS
- LAS

Technical Documentation

- RSS SMAP-SSS V2.0 ATBD, Validation Analysis and Data Users Guide (.pdf)
- Release notes for RSS SMAP-SSS V2.0 70km products (.pdf)
- JPL SMAP-SSS CAP V3.0 ATBD, Validation and Users Guide (.pdf)
- NASA SMAP Handbook

References

- Brown, D., R. Gran, A. Buls, 2015. International Spacecraft Carrying NASA's Aquarius Instrument Ends Operations. NASA press release 15-126, June 17, 2015. <http://www.nasa.gov/press-release/international-spacecraft-carrying-nasa...>
- Meissner, T, FJ Wentz, D LeVine, J. Scott, 2014a. Aquarius Salinity Retrieval Algorithm Theoretical Basis Document (ATBD), Addendum 3, report number 060414, Remote Sensing Systems, Santa Rosa, CA, 24 pp.
- Meissner, T, FJ Wentz, L Ricciardulli, 2014b. The emission and scattering of L-band microwave radiation from rough ocean surfaces and wind speed measurements from Aquarius, *Journal of Geophysical Research: Oceans*, 119, doi:10.1002/2014JC009837.
- Pepmeier, J. R., P. N. Mohammed, J. Peng, E. J. Kim, G. De Amici, and C. Ruf, 2015. SMAP L1B Radiometer Half-Orbit Time-Ordered Brightness Temperatures. [data used: antenna temperatures after RFI mitigation]. Boulder, Colorado USA: NASA National Snow and Ice Data Center Distributed Active Archive Center. <http://dx.doi.org/10.5067/1V3MVRRLCCT>.





SMAP Mission Page

- "Data Links" can be found at upper right
 - Click "Browse SMAP Salinity Data" to view catalog
 - There are currently 9 SMAP salinity products

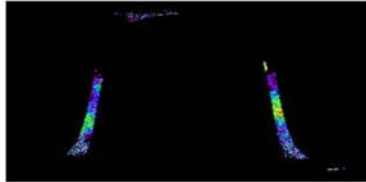
podaac.jpl.nasa.gov/smap

The screenshot shows the NASA Podaac website for the SMAP mission. At the top right, a red box highlights the "Data Links" section, which includes links to "Browse SMAP Salinity Data at PO.DAAC", "SMAP Salinity Products on PO.DAAC FTP", and "SMAP Soil Moisture Data at NSIDC". A red arrow points from this box to the "Dataset Discovery" section. The "Dataset Discovery" section shows a search for "smap" with 9 matching datasets. Two datasets are listed: "RSS SMAP Level 3 Sea Surface Salinity Standard Mapped Image 8-Day Running Mean V2.0 Validated Dataset" and "RSS SMAP Level 2C Sea Surface Salinity V2.0 Validated Dataset". The left sidebar contains a "Select Filter" section with various categories like Processing Levels, Across Swath Spatial Sampling, Grid Spatial Resolution, Temporal Resolution, Parameter, Latency, Collections, Platform, Sensor, Spatial Coverage, and Data Format.

Figure 1: (Left) Global soil moisture mapped image from SMAP. (Right) Derived sea surface salinity (SSS) from SMAP (8-day running mean composite)



SMAP Data - Orbital



RSS SMAP Level 2C Sea Surface Salinity V2.0 Validated Dataset

(SMAP_RSS_L2_SSS_V2)

Salinity/Density

Platform/Sensor: SMAP/SMAP_RADIOMETER

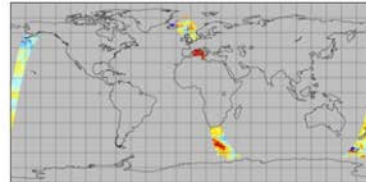
Processing Level: 2C

Along/Across Track Resolution: 39 km x 47 km

Start/End Date: 2015-Apr-1 to Present

Description: The version 2.0 SMAP-SSS, level 2C product contains the first release of the validated sea surface salinity orbital/swath data from the NASA Soil Moisture Active Passive (SMAP) observatory. ... [more](#)

RSS
Salinity/Density
~40 km (native) sampling
Version 2*



RSS SMAP Level 2 Sea Surface Salinity V2.0 70km Validated Dataset

(SMAP_RSS_L2_SSS_V2_70KM) ←

Salinity/Density

Platform/Sensor: SMAP/SMAP_RADIOMETER

Processing Level: 2C

Along/Across Track Resolution: 39 km x 47 km

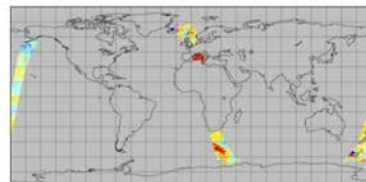
Start/End Date: 2015-Apr-1 to Present

Description: The version 2.0 70km SMAP-SSS, level 2C product is the second release of the validated sea surface salinity orbital/swath data from the NASA Soil Moisture Active Passive (SMAP) observatory ... [more](#)



RSS
Salinity/Density
70 km re-sampling
Version 2*

**Version 3 is expected to be released by Fall 2018*



JPL SMAP Level 2B CAP Sea Surface Salinity V4.0 Validated Dataset

(SMAP_JPL_L2B_SSS_CAP_V4)

Ocean Winds, Salinity/Density

Platform/Sensor: SMAP/SMAP_RADIOMETER

Processing Level: 2B

Along/Across Track Resolution: 60 km x 60 km

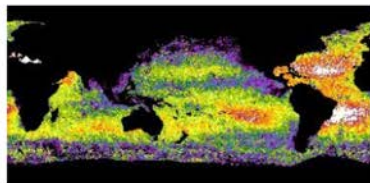
Start/End Date: 2015-Mar-31 to Present

Description: This is the PI-produced JPL SMAP-SSS V4.0, level 2B CAP, validated sea surface salinity and extreme winds orbital/swath product from the NASA Soil Moisture Active Passive (SMAP) observatory. ... [more](#)

JPL
Salinity/Density & Winds
60 km re-sampling
Version 4



SMAP Data – Gridded Monthly



RSS SMAP Level 3 Sea Surface Salinity Standard Mapped Image Monthly V2.0

Validated Dataset (SMAP_RSS_L3_SSS_SMI_MONTHLY_V2)

Salinity/Density

Platform/Sensor: SMAP/SMAP_RADIOMETER

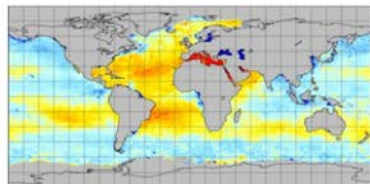
Processing Level: 3

Longitude/Latitude Resolution: 0.25 degrees x 0.25 degrees

Start/End Date: 2015-Apr-1 to Present

Description: The version 2.0 SMAP-SSS level 3, monthly gridded product is based on the first release of the validated standard mapped sea surface salinity (SSS) data from the NASA Soil Moisture ... [more](#)

RSS
Salinity/Density
~40 km (native) sampling
Version 2



RSS SMAP Level 3 Sea Surface Salinity Standard Mapped Image Monthly V2.0

70km Validated Dataset (SMAP_RSS_L3_SSS_SMI_MONTHLY_V2_70KM)

Salinity/Density

Platform/Sensor: SMAP/SMAP_RADIOMETER

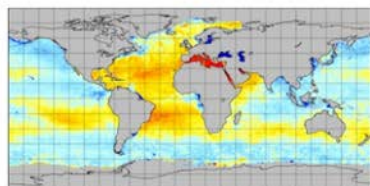
Processing Level: 3

Longitude/Latitude Resolution: 0.25 degrees x 0.25 degrees

Start/End Date: 2015-Apr-1 to Present

Description: The version 2.0 70km SMAP-SSS level 3, monthly gridded product is based on the first release of the validated standard mapped sea surface salinity (SSS) data from the NASA Soil Moisture ... [more](#)

RSS
Salinity/Density
70 km re-sampling
Version 2



JPL SMAP Level 3 CAP Sea Surface Salinity Standard Mapped Image Monthly V4.0

Validated Dataset (SMAP_JPL_L3_SSS_CAP_MONTHLY_V4)

Ocean Winds, Salinity/Density

Platform/Sensor: SMAP/SMAP_RADIOMETER

Processing Level: 3

Longitude/Latitude Resolution: 0.25 degrees x 0.25 degrees

Start/End Date: 2015-Apr-1 to Present

Description: This is the PI-produced JPL SMAP-SSS V4.0 CAP, level 3, monthly mapped sea surface salinity product from the NASA Soil Moisture Active Passive (SMAP) observatory. It is based on the ... [more](#)

JPL
Salinity/Density & Winds
60 km re-sampling
Version 4