

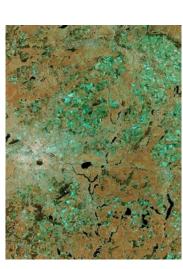
Sentinel-1A Status Update



- Sentinel-1A launched on 3 April 2014 on Soyuz from Kourou
- Nominal orbit reached on 7 August 2014
- Sentinel-1A In-Orbit Commissioning phase completed
 - IOCR Board successfully held on 23rd September 2014
 - Level-0 core products operational qualification completed
 - Level-1 core products pre-operational qualification completed

Latest Achievements

- Start of operational data delivery to MyOcean
- In-orbit optical link characterization between S1A and Alphasat
- Support provided to several emergency activations (e.g. Puglia and Liguria, Slovenia floods, Fogo volcano eruption)
- Roll-out of enhanced Data Hub software



Sentinel-1A Status Update



- > Sentinel-1A ramp-up activities progressing nominally
 - Operational qualification of core products
 - Monitoring and consolidation of CSC system key performance indicators
 - Final Routine Operations Readiness Review planned at IOCR + 8 months
- > Sentinel-1A upcoming milestones
 - Start of S1A routine support at CGS-Maspalomas and PAC-DLR
 - Roll-out of enhanced Data Hub software
 - Level-1 core products operational qualification completion
 - Initial operations of Collaborative GS data access hub infrastructure
- > Sentinel-1A technical status is online
 - Weekly Mission Status reports
 - Up to date ramp-up schedule
 - S1A observation plan

Sentinel-1B Status Update





Platform AIT testing on-going

SAR instrument tests completed

Sentinel-1B platform during integration in TAS-I Rome (courtesy of TAS-I)

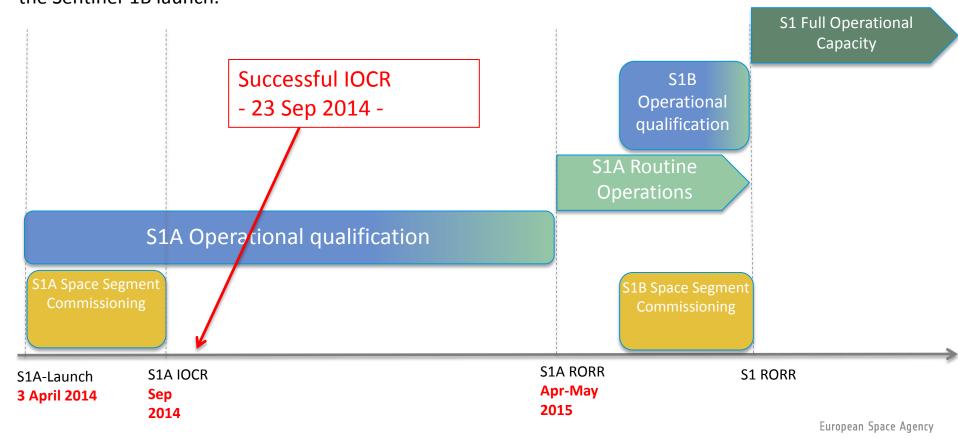
Sentinel-1B SAR Antenna during tests in Airbus Friedrichshafen (courtesy of Airbus)

An operational qualification phase leading to the Routine Operations



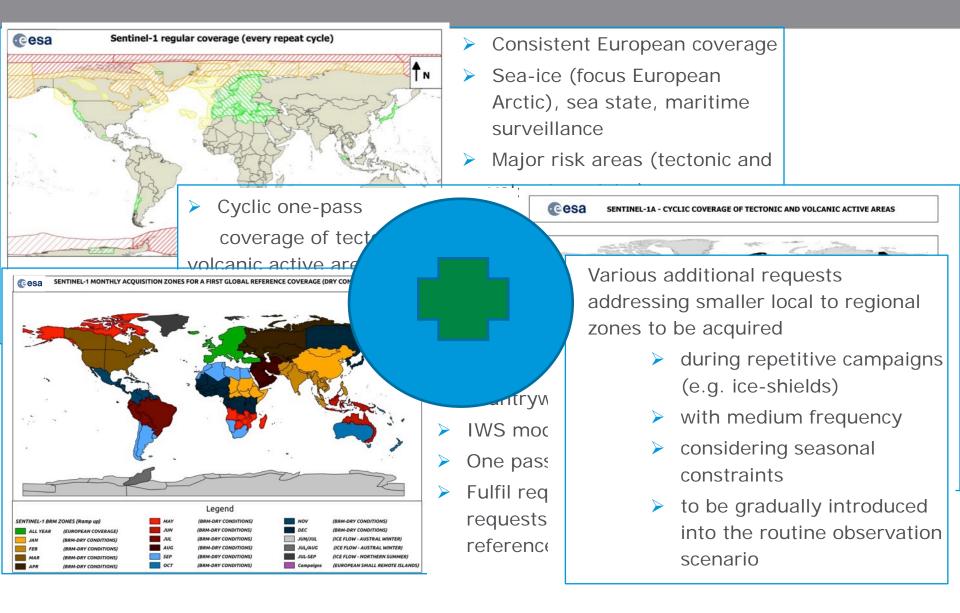
The Sentinel-1 full mission exploitation capability is based on the routine operation of the 2-satellites constellation.

Mission exploitation capacity is gradually achieved from Sentinel-1A launch to routine operations before the Sentinel-1B launch.



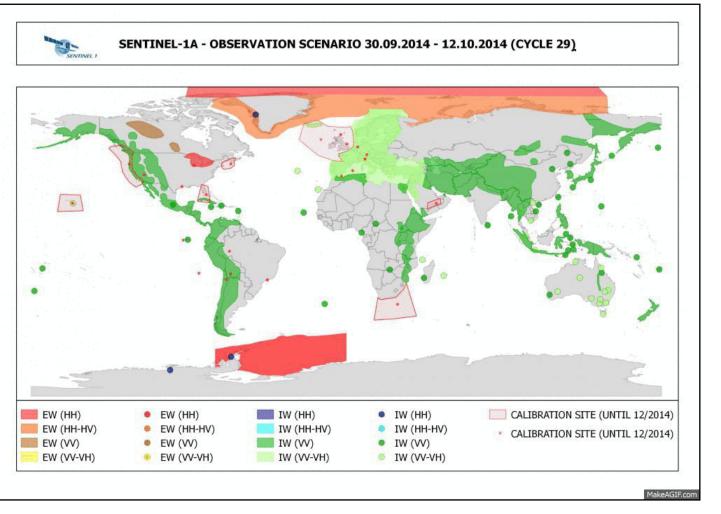
Sentinel-1A observation scenario - Approach for the Ramp-Up phase





Sentinel-1 Observation Scenario Start of Ramp-up Phase (from 30 Sep to 29 Nov)





 Overview of Sentinel-1A observation plan on a repeat cycle basis available at:

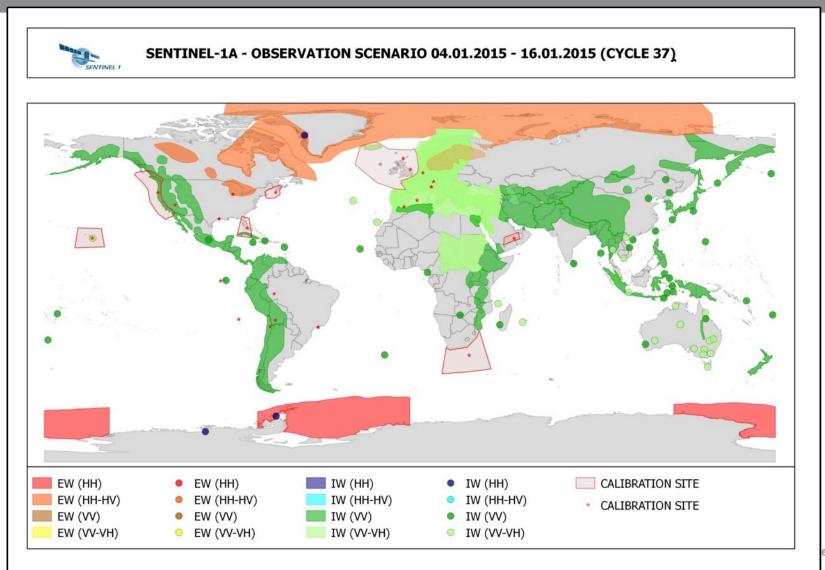
https://sentinel.esa.int/web/sent nel/ missions/sentinel-1/observationscenario

- In routine operations information will be provided several months in advance
- Will be complemented by .kml files providing detailed acquisition information (sensing time, mode, etc.) for approx. one month in advance

European Space Agency

Sentinel-1A observation scenario





Current default SLC production



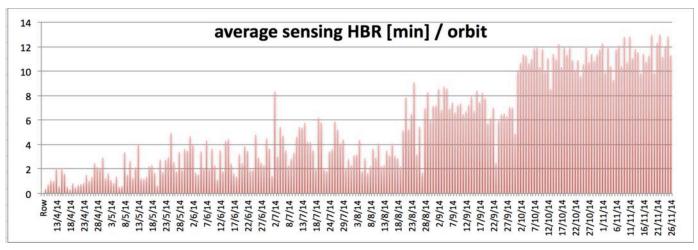


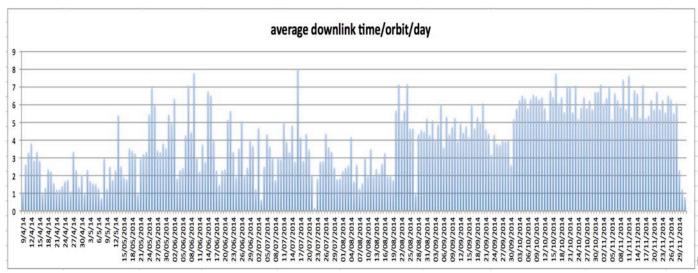
SENTINEL-1A: ROUTINE L1 SLC PRODUCTION ZONES (ACTUAL 12/2014)



Average sensing time & average downlink time per orbit







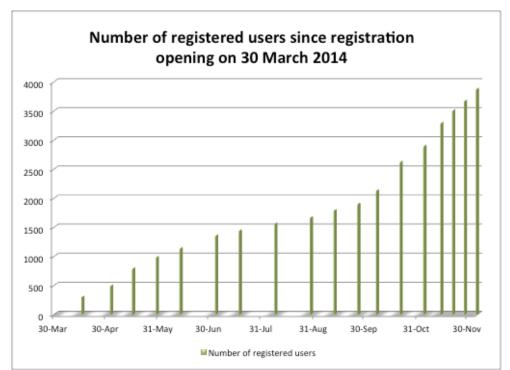
pean Space Agency

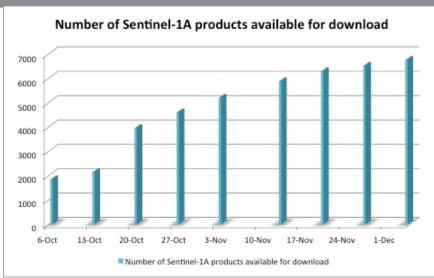
Sentinel-1 User and Data Statistics ("Scientific / Other Use" data hub)

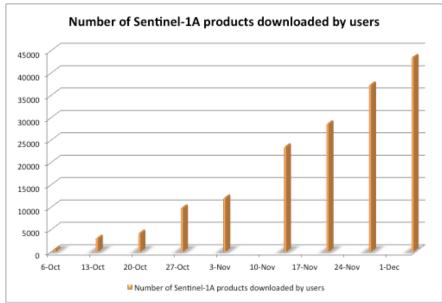


By 4 December 2014:

- ✓ 3877 registered users
- √ 6750 products available for download
- √ 43489 products downloaded by users, representing about 76 TB of data







Weekly Mission Status Reports available online



https://sentinel.esa.int/web/sentinel/missions/sentinel-1/mission-status





sentinel-1

→ RADAR VISION FOR COPERNICUS

Mission Status Report 1

Reference Period: 3 April - 7 April 2014

Mission Status

- Sentinel-1A was successfully launched from Kourou on 3 April 2014, 21:02 UTC
- The Launch and Early Orbit Phase (LEOP) was successfully performed according to the planned timeline and declared closed on 6 April at 16:00 UTC
- The Commissioning Phase has started

Satellite

The LEOP covered the main following key activities:

- Deployments of the solar panels (including, rotation) and of the Synthetic Aperture Radar (SAR) antenna
- Achievement of Satellite Nominal Mode and AOCS Nominal Pointing Mode
- · Switch ON and initial checks of the spacecraft sub-systems
- First operations of the X-Band Transmitter and the SAR instrument (3 min of Wave mode)

In addition, a collision avoidance manoeuvre was performed on 5 April

Ground Segment

- The Flight Operations Segment performed nominal during the complete 3 days of LEOP
- First X-band data acquisition took place at the Matera ground station on 6 April, early morning
- First SAR instrument data acquisition was performed on 6 April. The related measurement was successfully processed at UK-PAC
- The FOS and the PDGS were declared ready to support the commissioning phase

Outlook

- · Start of platform and payload commissioning activities
- First SAR acquisitions driven by the operational PDGS mission planning system are planned to start on 9 April, as part of the initial verification and calibration activities
- Start of orbit manoeuvre sequence to acquire the target reference orbit.







sentinel-1

→ RADAR VISION FOR COPERNICUS

Mission Status Report 35 Reference Period: 2 December 2014 – 8 December 2014

Mission status

- . The Sentinel-1A operational qualification phase is on-going
- The opening of the Sentinel-1 data flow to all users took place on 3rd October.
 Data can be accessed from: https://sentinel.esa.int
- The initial ramp-up observation scenario is being implemented, including in particular coverage of a first set of Copernicus Services areas of interest, of European land and coastal waters, of a set of tectonic/volcanic areas, as well as of other specific targets worldwide for various applications. See an overview at: https://sentlinel.esa.int/web/sentlinel/missions/sentlinel-1/bbservation-scenario
- The use of Sentinel-1A data by the pre-operational precursor of the Copernicus Marine Environment Monitoring Service MyOcean for sea-ice and iceberg monitoring activities is on-oping
- Sentinel-1A responded to an activation on 4 December from the International Charter Space and Major Disasters related to the Typhoon Hagupit in the Philippines, with the provision of several level 1 images
- The Sentinel-1A spacecraft is in a stable state, operating in Nominal Mission Mode (NMM), with all sub-systems working on prime units
- The inter-orbit link communication phase campaign between the Sentinel-1A OCP and the Alphasat TDP-1 payload has been successfully completed
- X-Band data acquisitions are routinely performed over Matera and Svalbard stations. Acquired data are circulated within the PDGS, systematically processed to Level-0 and Level-1 products and archived
- The gradual integration of the Maspalomas X-band core station and of the DLR Processing and Archiving Centre into Sentinel-1 operations is on-going and planned to be completed in December
- Sentinel-1 operational products qualification is being pursued as planned
- The distribution of generated SAR SM, IW and EW L0 & L1 user products is on-going. The regular products flow is available for download by any user. By 4 December:
 - A total of 3877 users have self-registered
 - o Since the opening of the regular data flow on 3 October:
 - 6750 products have been made available for download
 - 43489 product download have been made by users, corresponding to about 76 TB of data
- A maintenance on the Sentine! "Scientific/Other use" data hub (http://scihub.esa.int) took place from 5 to 8 December, for the installation of a new major release of the rolling archive software, allowing improved performance and functionalities – more information at: https://scihub.esa.in/hews/News00011
- · The overall operations mission performance is nominal

Report prepared by the ESA Sentinel-1 Team -

Outlook

· Continuation of ramp-up mission operations



Report prepared by the ESA Sentinel-1 Team -

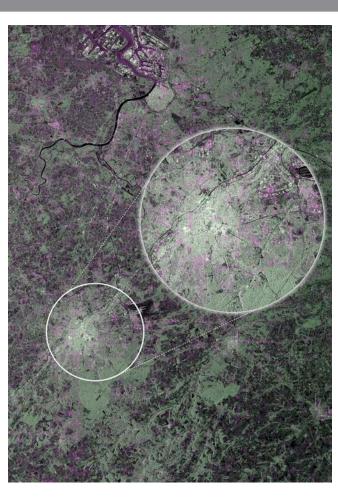


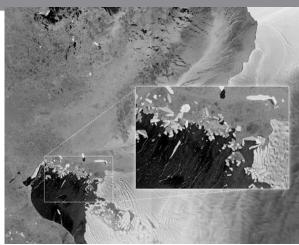


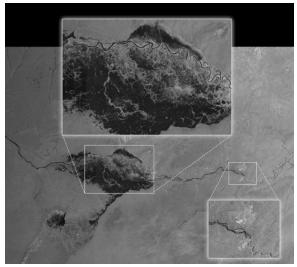
Examples of Sentinel-1A non-InSAR results!

SENTINEL-1A FIRST IMAGES









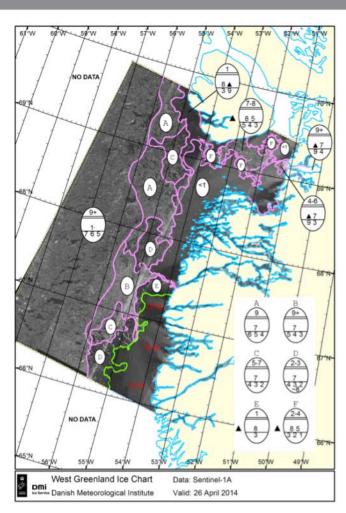


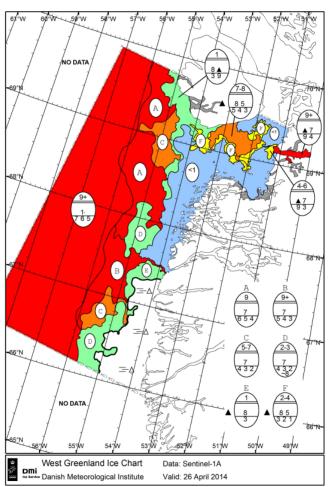
FIRST DEMONSTRATION OF SEA-ICE APPLICATIONS WITH SENTINEL-1A DATA CSA

The first
Sentinel-1
sea-ice
chart

Courtesy of DMI, MyOcean

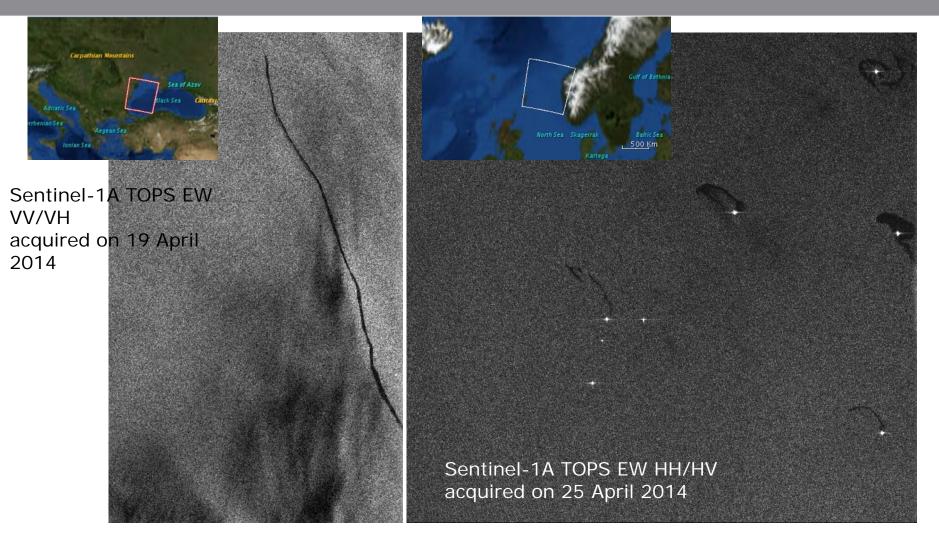
S1A image20140426 10:10 UTC, EWS, HH





First Oil Spills Detected by Sentinel-1

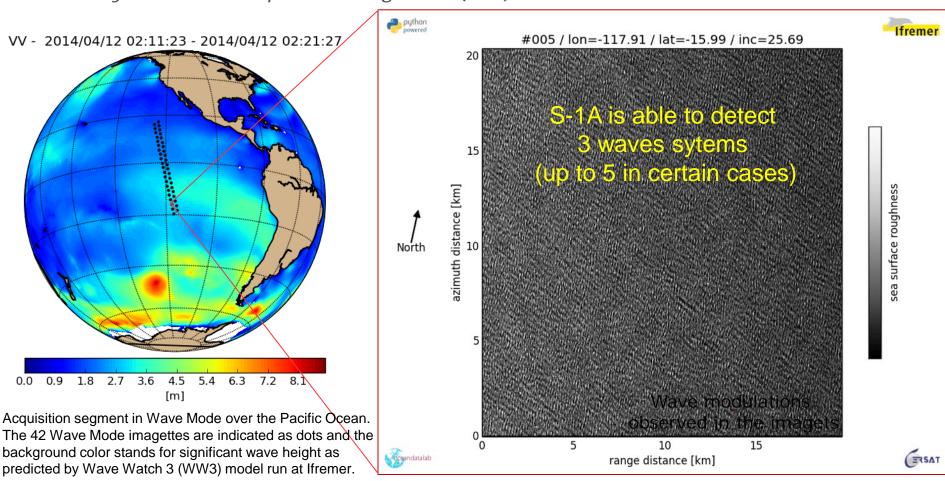




FIRST DEMONSTRATION FOR SEA STATE APPLICATIONS

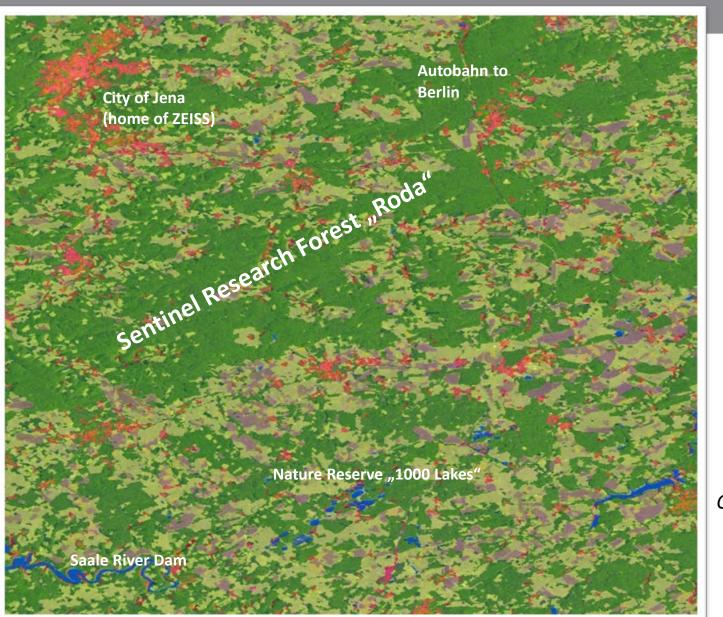


First Analysis of WM acquisition segment (1/2)



FIRST DEMONSTRATION OF LAND APPLICATIONS





Class. Method: Random Forest

Classes:
Forest
Water
Urban
Winter crops
Bare fields

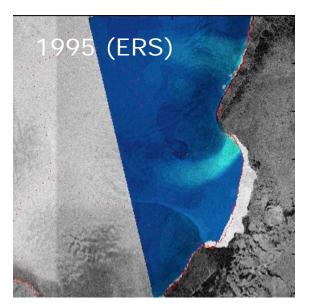
Courtesy University of Jena

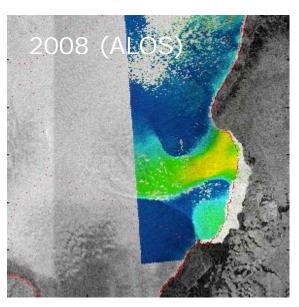
European Space Agency

First Sentinel-1 Scientific Result Fast moving Svalbard Ice Cap

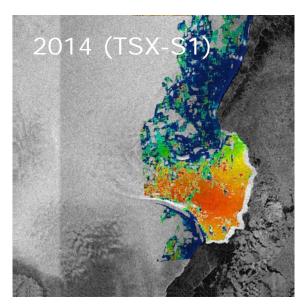


- Unique (first ever) combination of S1A stripmap and TerraSAR-X SAR data provides first map of Austfonna ice speed in 2014
- Data show that glacier at Cap Mohn has experienced a rapid acceleration



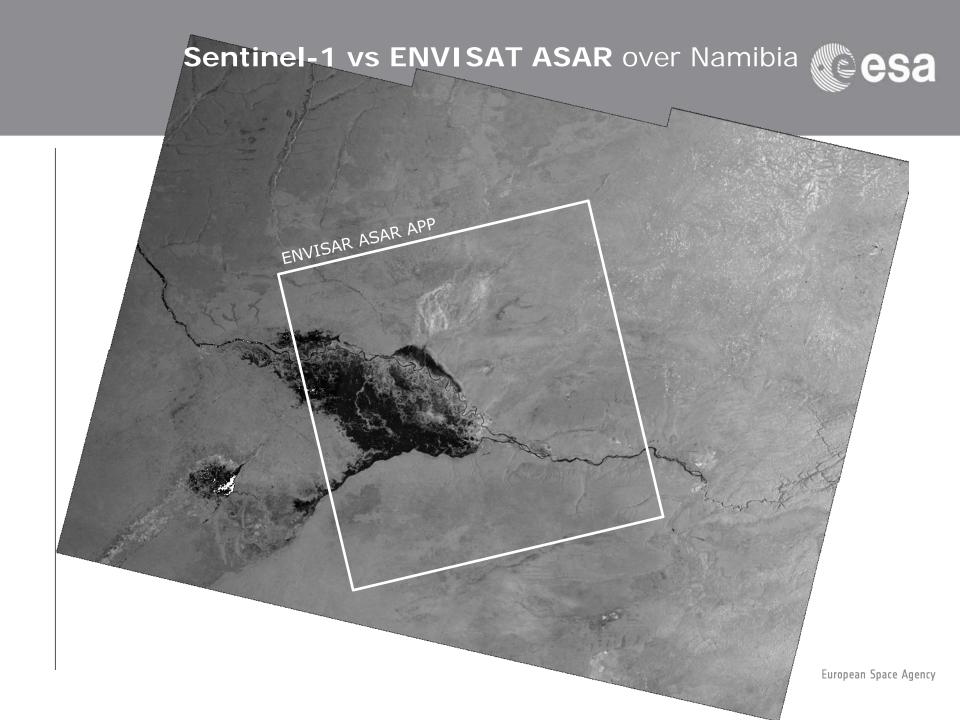


4



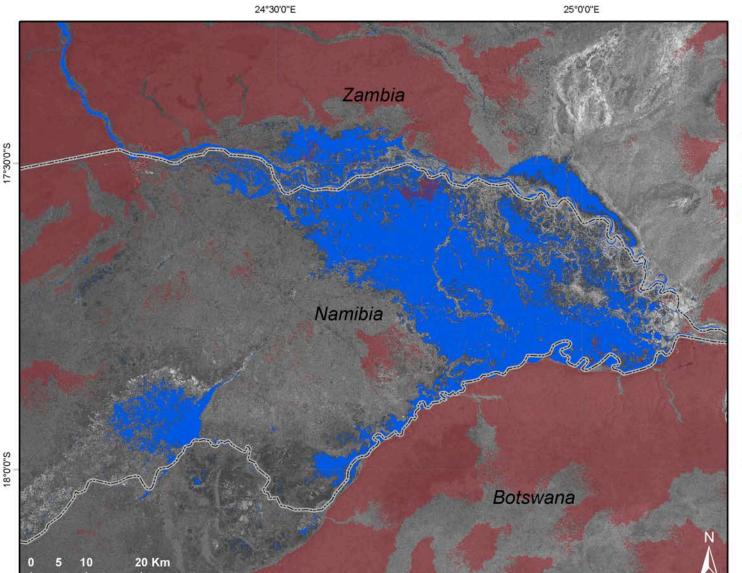
Ice Speed (kilometres per year)

Credit: N. Gourmelen, University of Edinburgh



Sentinel-1 Flood Monitoring of Caprivi Flood Plain, Namibia

TIGER NET





Legend

Country border



Derived HAND Index > 10 m



Flooded areas

Description:

This map shows the flooding situation in the Caprivi flood plain of Zambezi River on 13th of April, 2014. The flood was delineated with the Water Observation and Information System (WOIS) based on SENTINEL-1A satellite data.

Source data:

SENTINEL-1A IW mode, 20 m resolution, acquired on 13th of April, 2014 at 03:50 GMT.

SENTINEL-1 image was provided by the European Space Agency.

Cartographic Reference Projection: EPSG:4326 Datum: WGS 84



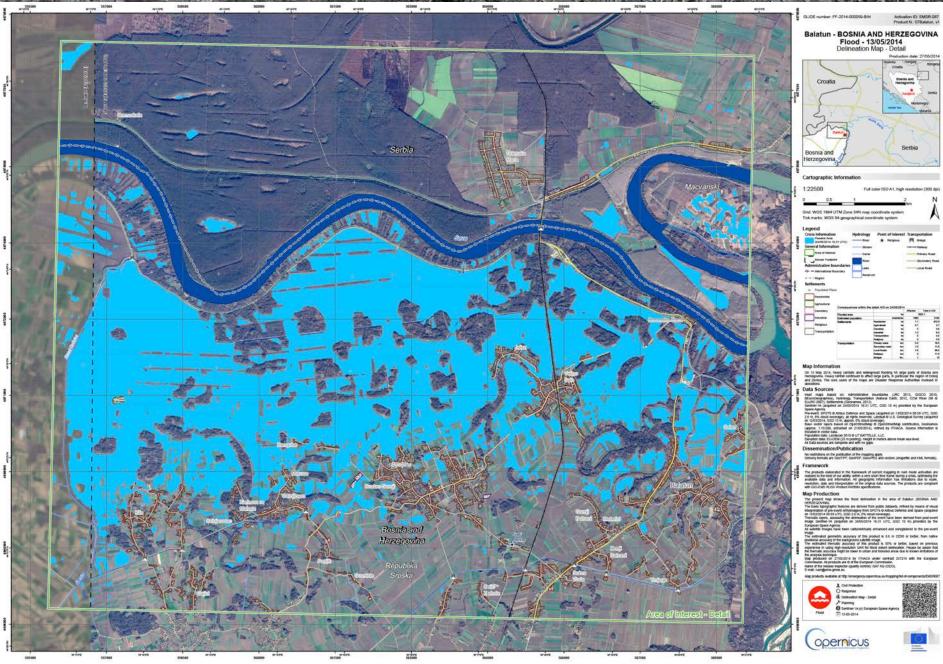








24°30'0"E 25°0'0"E



Balatun - BOSNIA AND HERZEGOVINA

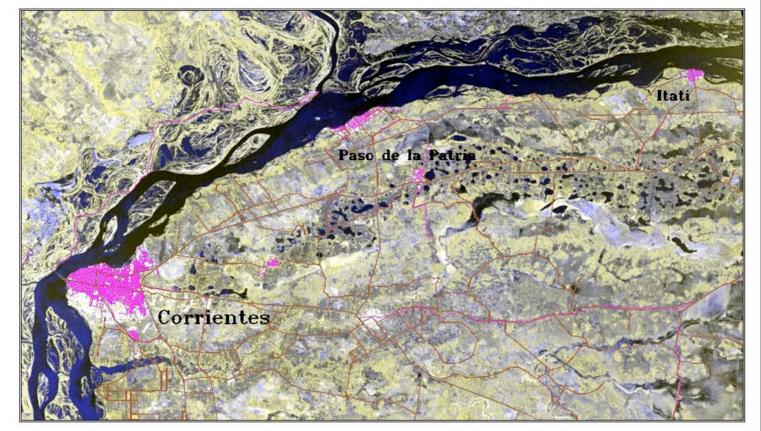
Flood - 13/05/2014



Full color ISO A1, high res



Paraná River's Flood Valley - June, 15 2014





Argentinean northeast

DESCRIPTION

Sentinel-1 image acquired on June 15, 2014. Paraná River's Flood Valley in the north of the Province of Corrientes on its border with Paraguay is observed. Cities of Corrientes, Paso de la Patria and Itati are identified. Paraná River and water bodies of the surrounding wetlands can be seen in a blue levels.

Road are drawn in brown. Satellite Data: SENTINEL-1

Imagery Date: June, 15 2014

Color Composition RGB=[HV,HV,HH]

Production: CAEARTE/CONAE ML Acknowledgement to Francesca Cecinati who exploited the data.

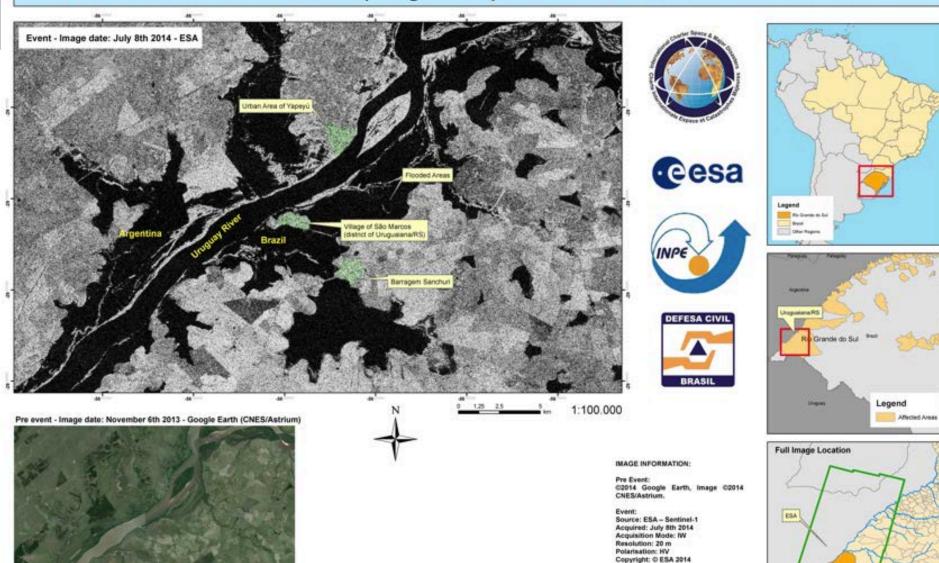








BRAZIL - FLOOD - São Marcos (Uruguaiana) - Rio Grande do Sul / RS - JULY 8th 2014



This product was generated using digital techniques and requires

field verification. There is no precision mapping in this product

Product ID: generated by CENAD (Brazilian National Risk and Disaster Menagement Center), through the agreement International Charter "Space and Major Disasters" Charter Astivation ID 425, with inspes provided by ISA- European Space Agency

STANDING WATERS IN TARIND MUHAMMED PANAH AREA, PUNJAB PROVINCE, PAKISTAN

Analysis with SENTINEL-1 data 16 September 2014

detected by SENTINEL-1 imagery acquired the 16 September 2014 in Taried Muhammad Parah area. The India and the 2014 in Tarkel Ministered Paran area. The notes and the Prejind rivers expanded and seem to have limiteded some agricultural feets string the India River and the Panjard River in the Panjard Province (Pakistan). This analysis has not yet been salidated in the first. Please send ground healback to.

Space and Major Grassers', For more Charles which is about





9/17/2014 Version 1.0

Activation Number: FL20140910FAX

Production Date:





Primary Road

Secondary Road Local Urban Road

District Boundary

WATER EXTENT ANALYSIS





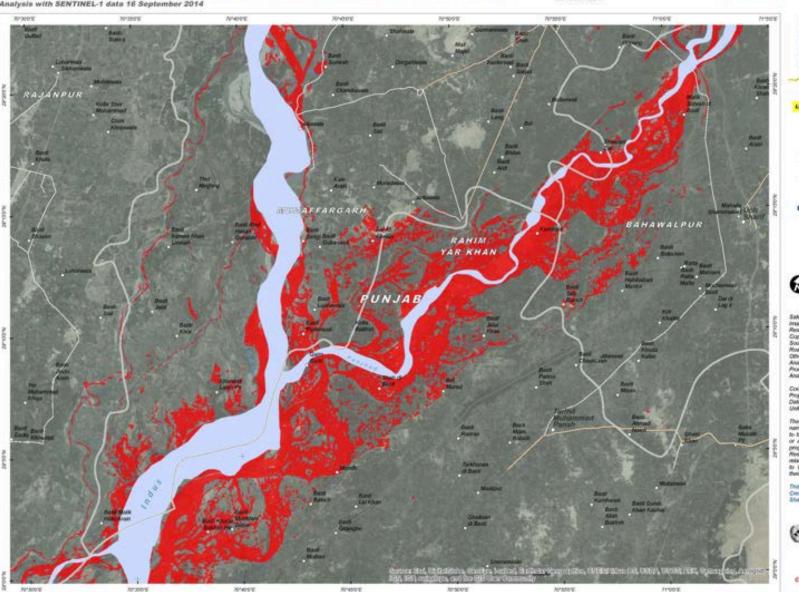
Satelite Data (1): SENTINEL-1 Imagery Dates: 16 September 2014 Resolution: 10m Copyright ESA Source: ESA Road Date: Google Map Maker / OSM / ESR/ Other Date: USGS, UNCS, NASA, NGA Analysis: LINITAR / LINCOAT Production: UNITAR / UNGSAT Analysis conducted with ArcGIS v10.2

Coordinate System: WGS 1984 UTM Zone 42N Projection: Transverse Mercator Datum: WGS 1964

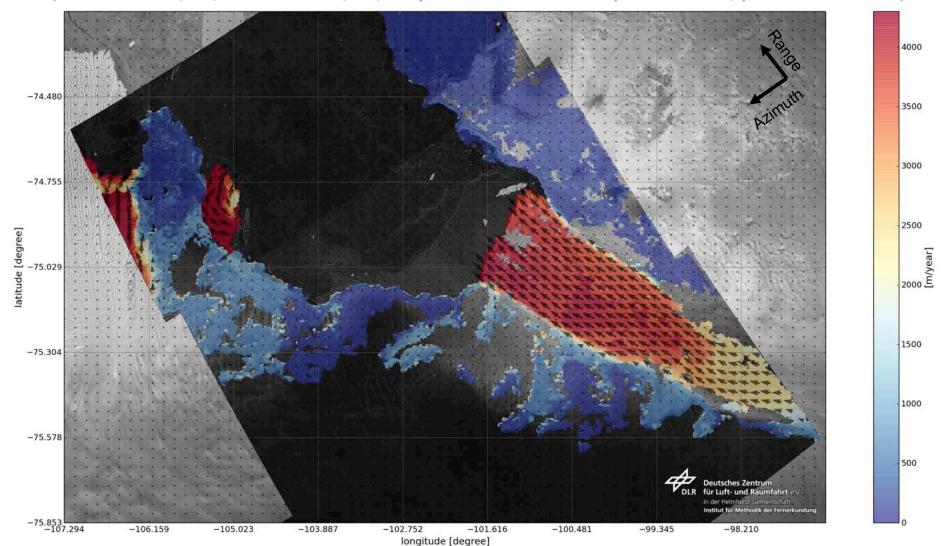
The depiction and use of boundaries, geographic names and misted data shown here are not warranted to be error-free nor do they imply official endorsement or acceptance by the United Nations. UNGSAT to a program of the United Nations institute for Training and Research (CRETAR), providing satelite imagery and netated geographic information, research and analysis to UN humanitarian and development agencies and their implementing partners.

This work by UNITARUWOSAT is isomed under a Creative Commons Attribution-NonCommonsal-Share-folia 3.0 Unported License.





Horizontal ice flow velocities of the Pine Island Glacier derived from Sentinel-1A Data (data of 2014/08/08 and 2014/08/20 yields velocities of up to 4270 m/year at the front)



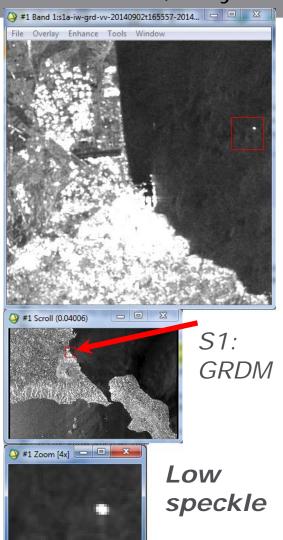


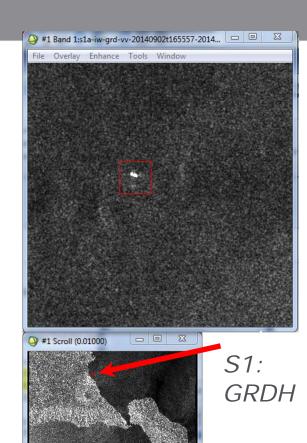


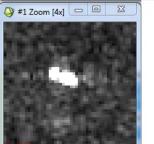
PRELIMINAY RESULTS Maritime surveillance



Catania Harbour, Italy





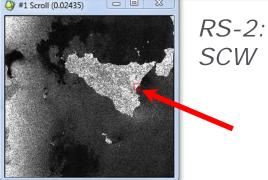


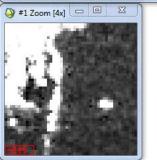
Ship direction



MDA/EMSA

RS2_NSPO_35045_20140831170355_





PRELIMINAY RESULTS Ship detection



Correlation with AIS (Automatic Identification System) data*

*data acquired from www.marinetraffic.com



Wadi Alarish

Flag: Egypt

Home port: Alexandria

Build: 1994

Type: Cargo

Gross Tonnage: 37550

Deadweight: 64214 t

Length and Breath:

225m x32.24m

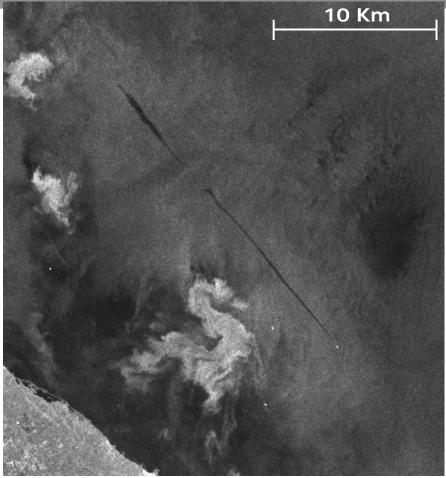
Status: Active





Oil discharge







S1A_IW_GRDH_1SDV_20140903T045517_20140903T045542_002223_002459_3497 Lat: 40.340 Lon: 18.554

PRELIMINAY RESULTS Wind measurement



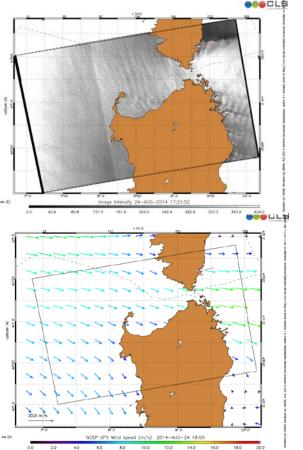
Bayesian Wind measurement performed using SARTool(c) software from CLS (development version with experimental calibration constant)

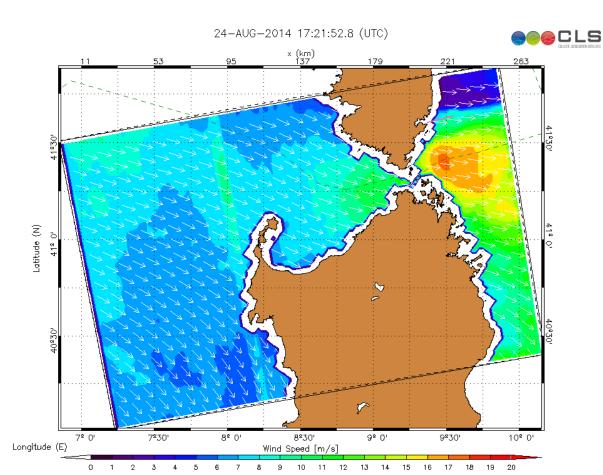
Interferometric Wide Swath / Double Polarisation V (VV + VH), only <u>VV processed</u>

Acquired on 2014-08-24 T 17-21-27

S1A_IW_GRDH_1SDV_20140824T172127_20140824T172152_002085_00210B_8A0C

Strait between Sardigna and Corsica

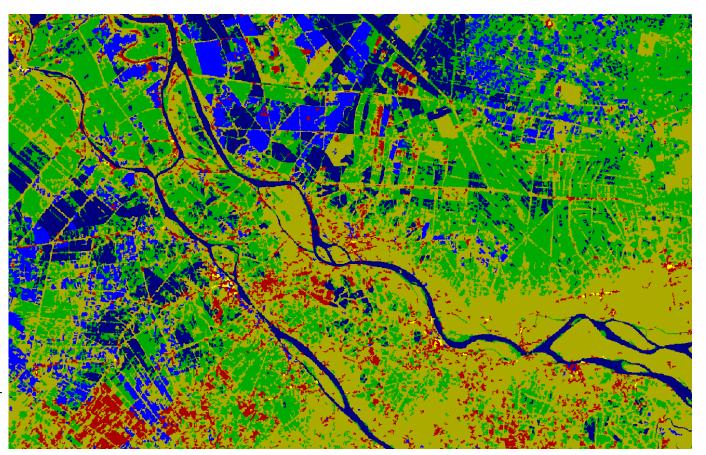




PRELIMINAY RESULTS RICE MONITORING



S-1A geocoded – 8 & 20 Aug, 80m (detail) – Vietnam

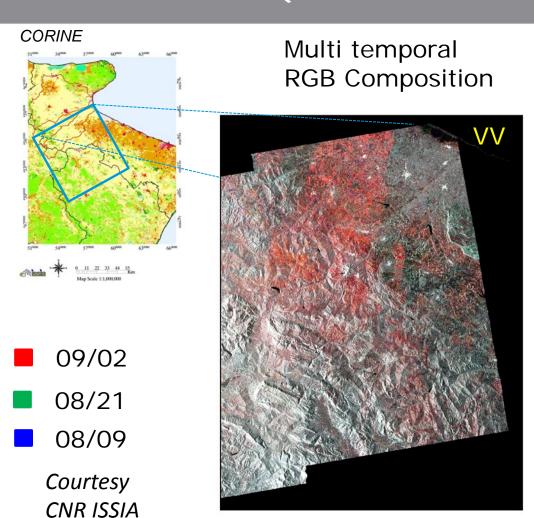


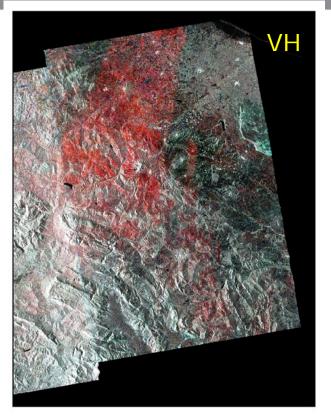
rice stage 1 rice stage 2 rice stage 3 non-rice

Courtesy SARMAP

PRELIMINAY RESULTS Soil Moisture (with SLC Geocoded products)



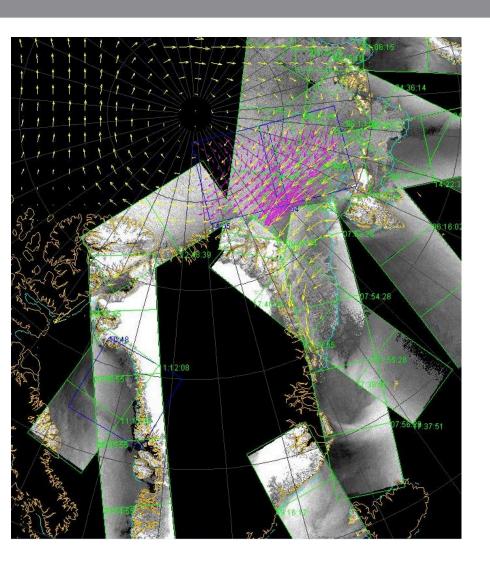




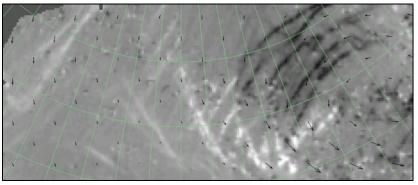
Soil moisture change due to precipitation fields on September 2nd

SAR mosaic from Sentinel-1a with MyOcean data CSA

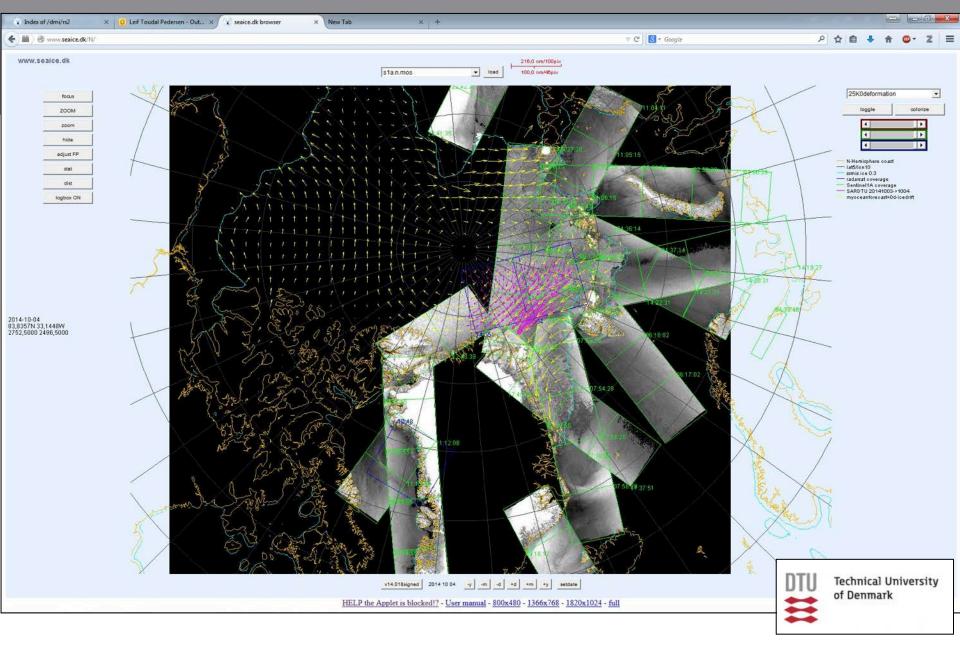




- Mosaic of SAR data from Sentinel-1 on the very first day of operational delivery (October 4, 2014)
- Excellent Arctic coverage at this early stage of the ramp up phase
- This capability of S1A(+B) will provide the data background for development of next generation ice drift modules in Climate- and sea ice models.

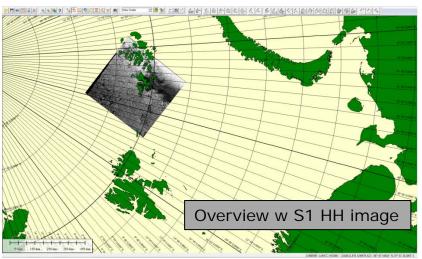


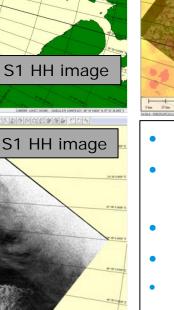
European Space Agency

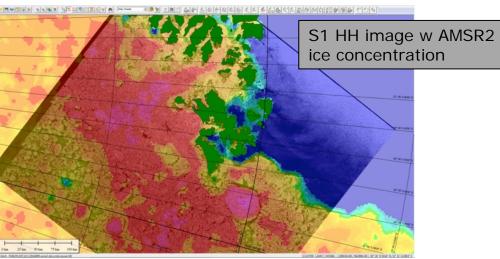


Applicability for ice charting







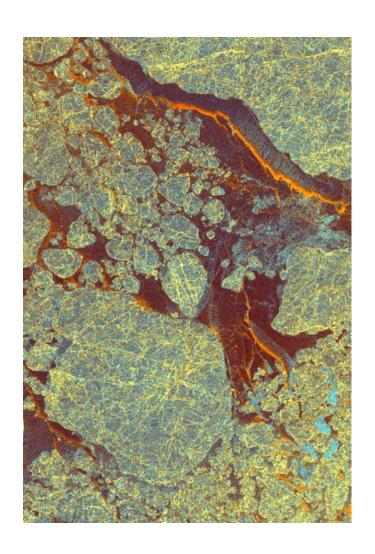


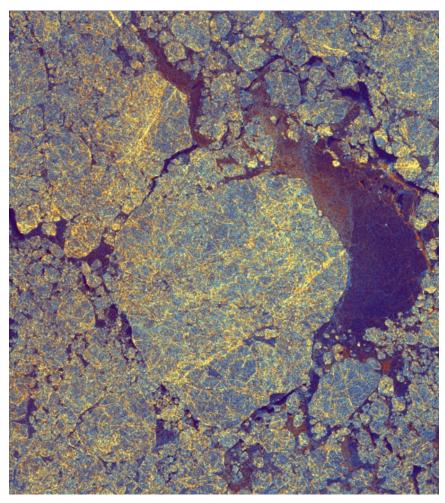
- Barents Sea Sept 3, 2014
- Sentinel-1 HH image from Sept 3, 2014
- AMSR-2 image from Sept 3, 2014
- Quality good, Geometry good
- s1a-ew-grd-hh-20140903t044329-20140903t044433-002223-002457-001.tiff



Sentinel-1A dual polarisation SAR for ice charting







European Space Agency





