

Programmes for access to TerraSAR-X, TanDEM-X and RapidEye data for science

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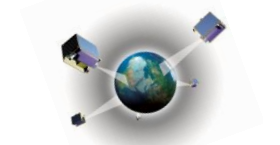
1: DLR Space Administration, Bonn, Germany; 2: DLR German Remote Sensing Data Center, Oberpfaffenhofen, Germany; 3: ETH Zurich / DLR Oberpfaffenhofen



Knowledge for Tomorrow



National EO Missions

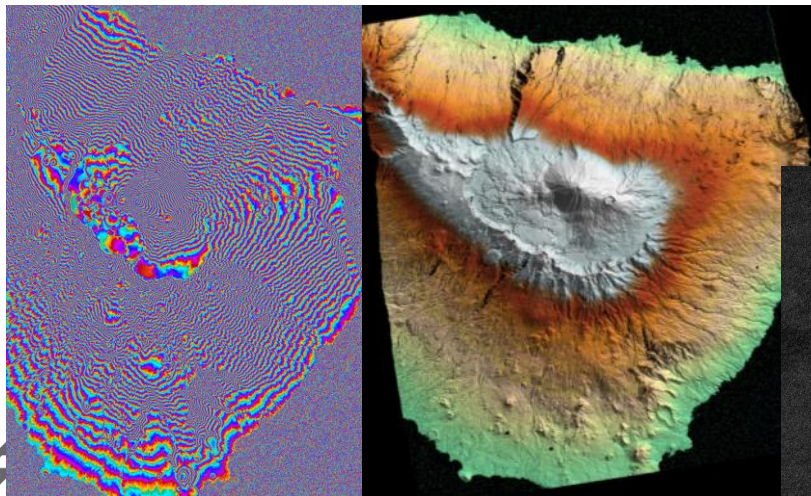


TerraSAR-X Launch: June 2007	PPP		<i>Radar</i>
TanDEM-X Launch: June 2010 Formation flight with TerraSAR-X	PPP		
RapidEye Launch: August 2008	PPP		<i>Optic</i>
EnMAP In Phase D Launch: end 2019			
METimage In Phase C/D Launch: 2021		 Bundesministerium für Verkehr und digitale Infrastruktur	
MERLIN In Phase C/D Launch: End 2021			
GRACE Since 2002			<i>Gravity</i>
GRACE-FO Launch 2018		 Bundesministerium für Bildung und Forschung	

TerraSAR-X and TanDEM-X



- Launched in 2007 and in 2010
- Public Private Partnerships between DLR & Airbus DS / Infoterra GmbHs
- Scientific and commercial exploitation
- global DEM available free of charge for institutional users in >25 countries
- limited DEM data available free of charge for all scientific users
- global 90 m DEM will be available soon free of charge



TerraSAR-X

Image Products



Mode	Res (Az.)	Swath
Wide ScanSAR	40m	200km
ScanSAR	16m	100km
Stripmap	3m	30km
Spotlight	1m	5x10km
Staring Spotlight	0,24	2,5x5km



Data access

Scientific data access

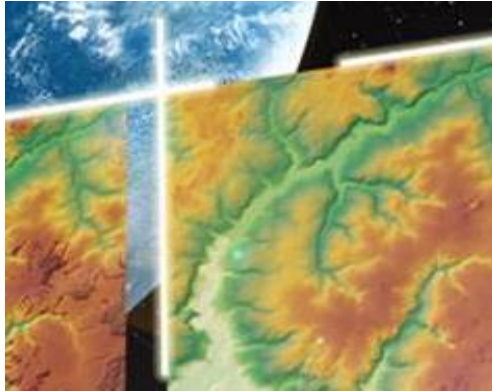
- ☐ The primary entry point is the TerraSAR-X Science Service System: <http://sss.terrasar-x.dlr.de/>
A research proposal is required.
- ☐ The AO for General Proposal Submission is permanent open. Marginal COFUR Costs for data handling are applicable.
- ☐ All science proposal submission details are included in http://sss.terrasar-x.dlr.de/pdfs/how_to_submit_a_tsx_proposal.pdf
- ☐ The AO for the utilization of the **TerraSAR-X archive** provides data older than 18 months **free of charge** on request.
- ☐ EOWEB® an EOWEB® Geoportal: <http://eoweb.dlr.de/>

Commercial data access

- Customer Service: <http://www.intelligence-airbusds.com/terrasar-x/>
- Direct Access Stations, Resellers and Regional offices

TanDEM-X

Bistatic Products *



DLR Products	Res
Science CoSSCs	12m
Science DEM (core)	12/30m
Global DEM (Release 2017)	90m

AIRBUS products	Res
WorldDEM™ core	12m
WorldDEM™ edited	12m
WorldDEM™ DTM	12m

Data access

Scientific data access:

- ☐ The primary entry point is the TanDEM-X Science Service System: <https://tandemx-science.dlr.de/>
A research proposal is required
- ☐ The AO for General Proposal Submission is permanent open. Marginal COFUR Costs for data handling are applicable. AOs for specific products are released frequently
- ☐ All science proposal submission details are included in https://tandemx-science.dlr.de/pdfs/TD-GS-UM-0115-TanDEM-X-Science-Service-System-Manual_V1.0.pdf.
- ☐ EOWEB® and EOWEB® Geoportal: <http://eoweb.dlr.de//>

Commercial data access

Contact Customer Service for available products and demo data

<http://www.intelligence-airbusds.com/en/5689-worlddem-data-request-form>

- WorldDEM™ DTM Now Available
- WorldDEM™ Availability
- WorldDEM™ Pricelist



Sample Data

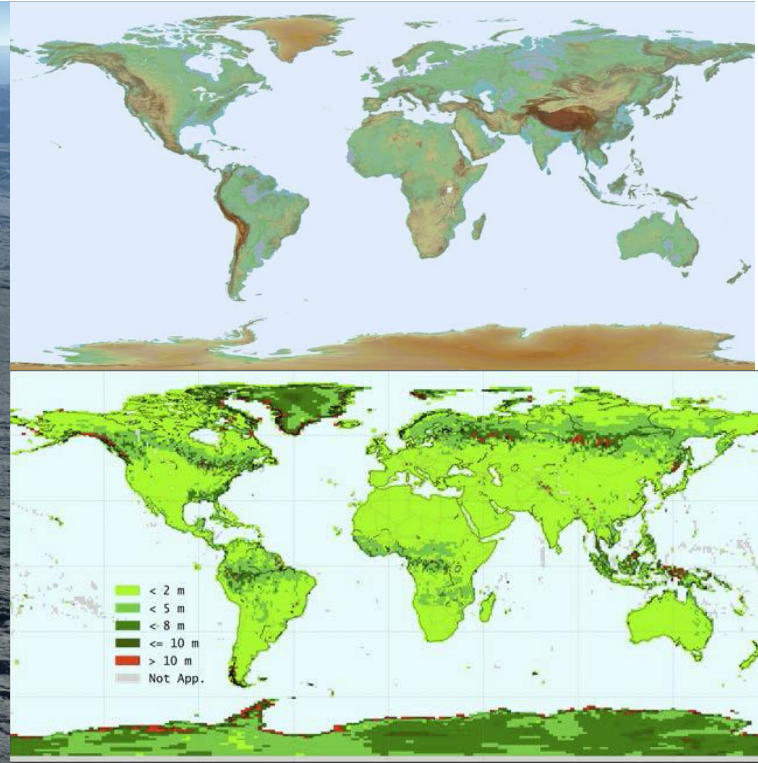


Order WorldDEM™
Now

Global DEM – TanDEM-X WorldDEM™

DEM AO 2016 : 757 scientific proposals submitted to DLR to access free data

-TanDEM-X DEM (Kamtschatka)



- ☐ First consistent Global DEM in 12m resolution
- ☐ Based on two global coverages 2010-2014
- ☐ 470.000 RAWDEMs to produce 20.000 final DEM-Tiles



Absolute Height Error
per DEM Tile.

< 2 m	: 56.77%
< 5 m	: 22.31%
< 8 m	: 11.1%
<= 10 m	: 1.4%
> 10 m	: 1.68%
Not App.	: 6.74%



TerraSAR-X & TanDEM-X



catalog - order –browse – download service

EOWEB® GeoPortal

Home Catalog Maps

Filter Management Filter: Time Collections Region Clear Filters Hide Filter Gallery

Filter by Region

33°56'44"S 26°14'26"E

Show Advanced Map Set Region

Filter by Time

Starttime: 2013-09-06 00:00 HH:MM Endtime: 2016-09-06 23:59 HH:MM

Choose a range Set Time

Filter by Collection

- ☐ O3M-SAF
- ☐ Optical Sensors High Resolution
- ☐ Optical Sensors Medium Resolution
- ☐ SAR (Synthetic Aperture Radar Data)
- ☐ SWACI
- ☒ TSX-1
- ☐ TanDEM-X
- ☐ IRS

Items View 0 of 11 results selected Toggle View

Nr	Avail.	Product Type	Start Date	End Date	Mission/Satellite	Sensor Mode	Satellite Number	Sensor/Instrument	Beam
TSX-1.SAR.L1b-Stripmap									
21	●	TSX-1.SAR.L1b-Stripmap	2016-03-11T16:47:27.896Z	2016-03-11T16:47:36.571Z	SAR_SM_		1	SAR	stripFar_004
22	●	TSX-1.SAR.L1b-Stripmap	2016-03-16T03:47:50.482Z	2016-03-16T03:47:58.155Z	SAR_SM_		1	SAR	stripNear_005
23	●	TSX-1.SAR.L1b-Stripmap	2016-04-02T16:47:29.123Z	2016-04-02T16:47:37.805Z	SAR_SM_		1	SAR	stripFar_004
24	●	TSX-1.SAR.L1b-Stripmap	2016-04-24T16:47:30.159Z	2016-04-24T16:47:38.845Z	SAR_SM_		1	SAR	stripFar_004
25	●	TSX-1.SAR.L1b-Stripmap	2016-04-29T03:47:52.133Z	2016-04-29T03:47:59.816Z	SAR_SM_		1	SAR	stripNear_005
26	●	TSX-1.SAR.L1b-Stripmap	2016-05-16T16:47:31.456Z	2016-05-16T16:47:40.131Z	SAR_SM_		1	SAR	stripFar_004
27	●	TSX-1.SAR.L1b-Stripmap	2016-06-07T16:47:31.644Z	2016-06-07T16:47:40.322Z	SAR_SM_		1	SAR	stripFar_004
28	●	TSX-1.SAR.L1b-Stripmap	2016-06-29T16:47:33.116Z	2016-06-29T16:47:41.801Z	SAR_SM_		1	SAR	stripFar_004

Hide Preview

<https://geoservice.dlr.de/egp>



Data access for science for TerraSAR-X and TanDEM-X

- Registration
- **Proposal submission (!)**
 - Team composition, innovation and contribution to mission objectives.
 - Detailed description of the project
 - Data requirements
 - Co-Investigators
- Evaluation process:
 - scientific benefit, contribution to the mission objectives and feasibility
- Data costs
 - Data costs are COFUR; special conditions for dedicated calls and scientific programs under GEO/CEOS as well as archive data



Open Calls TerraSAR-X & TanDEM-X

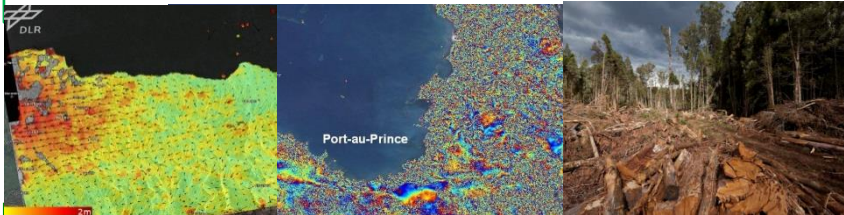
Name of the Call	Description	Due Date
Special TerraSAR-X products	TerraSAR-X like processed products from TanDEM-X pursuit monostatic phase and experimental TerraSAR-X products	unlimited
TerraSAR-X Archive	Archived data older than 18 months	unlimited
GENERAL Proposal Submission	TerraSAR-X data products according to the COFUR price list	unlimited
GENERAL Proposal Submission DEM	TanDEM-X data products (DEM, intermediate DEM, CoSSC) according to the COFUR price list	unlimited



Data Support for International Initiatives e.g.:



- ❑ Free data access for R&D via Supersites Server
- ❑ Data acquisitions for Geohazard Supersites and Disaster Pilot Projects



- ❑ Free Data for R&D
- ❑ TSX Background Mission

Int. Charter Space & Major Disasters



- ❑ Free TSX data for emergency response
- ❑ New acquisitions and archive images as quickly as possible
- ❑ Data access restricted to Charter Project Manager / Value Adders



TSX data contributions to Disaster Risk Reduction

- **CEOS/GEO Geohazard Supersites are supported with TSX data:**
 - Hawaii: since end of 2012
 - Iceland: since end of 2013
 - Marmara Region (Turkey): since end of 2014
 - Ecuador volcano supersite since end of 2014
 - Etna & Vesuv since end of 2014
 - Neuzealand since end of 2014
 - Greece 2016
 - San Andreas Fault (US) 2017
 - In addition: support to „Event Supersites“ (only temporary existence)
- The objective of the Geohazard Supersites is to support international research consortia in their work for a better understanding of geohazards (seismic and volcanic hazards) by providing a pool of data (satellite-based and in-situ)



TSX data contributions to Disaster Risk Reduction

- **CEOS Disaster Risk Pilots:**

- Volcano Pilot: contribution of ca. 400 images for volcanoes in Latin America (in the time period of 2014-17)
 - Seismic Pilot: 65 images after earthquake in Greece
 - Landslide Pilot to be started soon
- The objective of the „Disaster Risk Pilots“ is to demonstrate the possible use of EO data in support of Disaster Risk Management, building on a combination of satellites of CEOS member agencies.
 - data contributions under the seismic pilot support the objective to *develop and demonstrate advanced science products for rapid earthquake response*
 - Volcano pilot scientist have already demonstrated that interferograms based on radar satellite data can significantly help local volcano observatories in Latin-American countries to better understand ongoing volcanic processes and threats.



Data access for CEOS Supersites & Disaster Risk Pilots



Doc.: TX-PGS-PL-4135
Issue: 1.0
Date: 30.09.2014

- Unified proposal process for involved CEOS agencies
- TerraSAR-X data provided via a special server, allowing access of all members of international science teams
- Simple registration process
- special licence for GEO/CEOS science users (derived from the general scientific licence for TSX/TDX)
- Not included yet: TanDEM-X global DEM products

User License for the Utilisation of TerraSAR-X / TanDEM-X Data and Products for Scientific Use

between

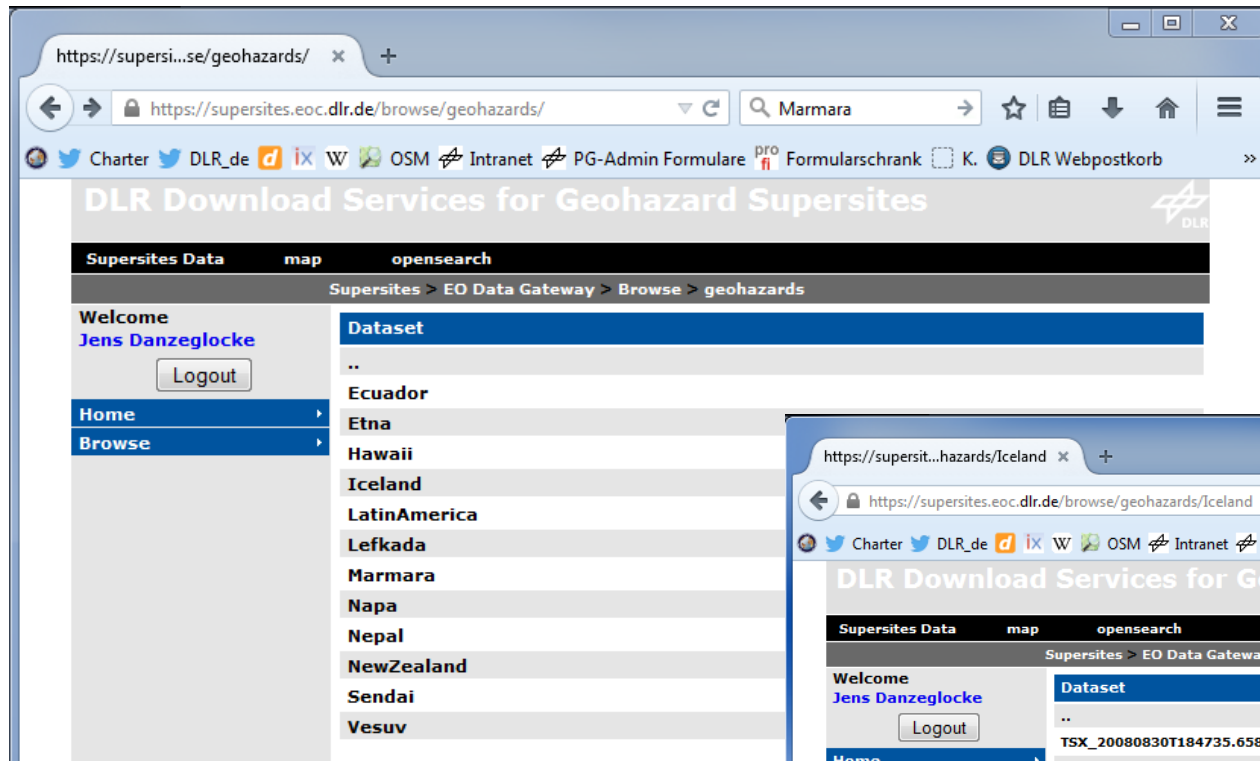
DLR

and

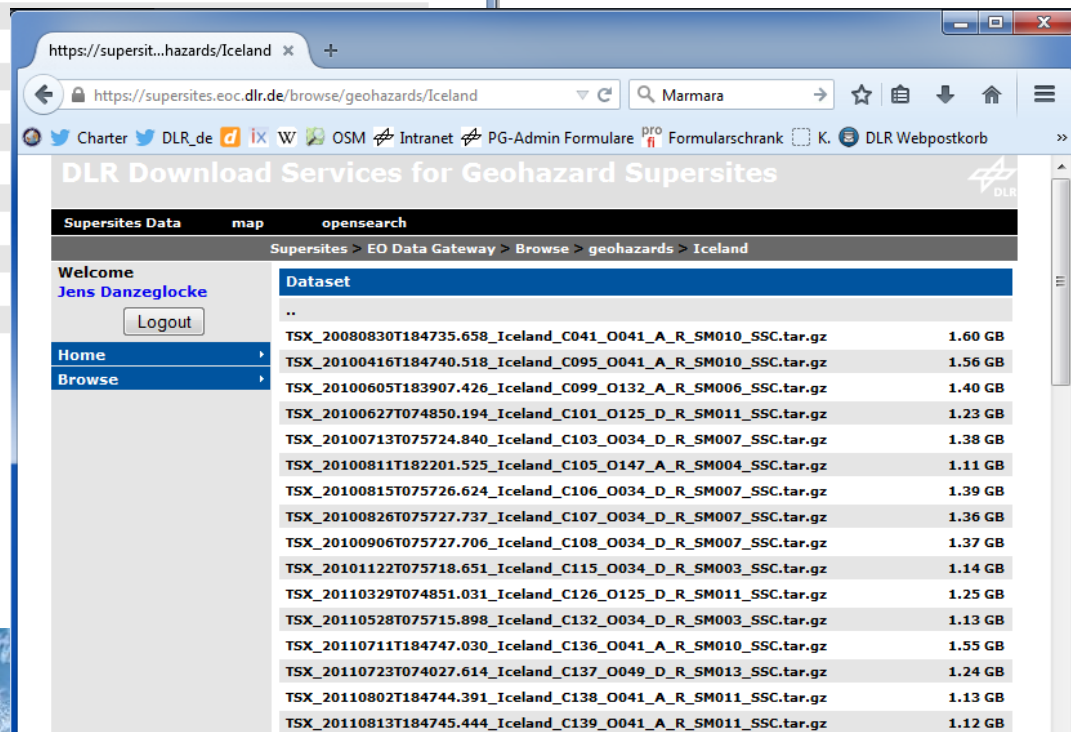
**Registered Users
at the DLR Download Service for the
Geohazard Supersites**



DLR Supersites Server



The screenshot shows the homepage of the DLR Supersites Server. The browser address bar displays `https://supersites.eoc.dlr.de/browse/geohazards/`. The page title is "DLR Download Services for Geohazard Supersites". A navigation bar includes links for "Supersites Data", "map", and "opensearch". Below this, a breadcrumb trail reads "Supersites > EO Data Gateway > Browse > geohazards". On the left, a sidebar welcomes "Jens Danzeglocke" and provides a "Logout" button. A menu lists various locations: Home, Browse, Ecuador, Etna, Hawaii, Iceland, LatinAmerica, Lefkada, Marmara, Napa, Nepal, NewZealand, Sendai, and Vesuv. The main content area is titled "Dataset" and currently shows a blank space.



This screenshot shows the dataset list for the "Iceland" geohazard. The browser address bar displays `https://supersites.eoc.dlr.de/browse/geohazards/Iceland`. The page title remains "DLR Download Services for Geohazard Supersites". The breadcrumb trail is updated to "Supersites > EO Data Gateway > Browse > geohazards > Iceland". The sidebar and navigation elements are consistent with the previous view. The main content area, titled "Dataset", displays a list of 18 datasets, each with a unique identifier, a description, and a size in GB.

Dataset	Size
TSX_20080830T184735.658_Iceland_C041_O041_A_R_SM010_SSC.tar.gz	1.60 GB
TSX_20100416T184740.518_Iceland_C095_O041_A_R_SM010_SSC.tar.gz	1.56 GB
TSX_20100605T183907.426_Iceland_C099_O132_A_R_SM006_SSC.tar.gz	1.40 GB
TSX_20100627T074850.194_Iceland_C101_O125_D_R_SM011_SSC.tar.gz	1.23 GB
TSX_20100713T075724.840_Iceland_C103_O034_D_R_SM007_SSC.tar.gz	1.38 GB
TSX_20100811T182201.525_Iceland_C105_O147_A_R_SM004_SSC.tar.gz	1.11 GB
TSX_20100815T075726.624_Iceland_C106_O034_D_R_SM007_SSC.tar.gz	1.39 GB
TSX_20100826T075727.737_Iceland_C107_O034_D_R_SM007_SSC.tar.gz	1.36 GB
TSX_20100906T075727.706_Iceland_C108_O034_D_R_SM007_SSC.tar.gz	1.37 GB
TSX_20101122T075718.651_Iceland_C115_O034_D_R_SM003_SSC.tar.gz	1.14 GB
TSX_20110329T074851.031_Iceland_C126_O125_D_R_SM011_SSC.tar.gz	1.25 GB
TSX_20110528T075715.898_Iceland_C132_O034_D_R_SM003_SSC.tar.gz	1.13 GB
TSX_20110711T184747.030_Iceland_C136_O041_A_R_SM010_SSC.tar.gz	1.55 GB
TSX_20110723T074027.614_Iceland_C137_O049_D_R_SM013_SSC.tar.gz	1.24 GB
TSX_20110802T184744.391_Iceland_C138_O041_A_R_SM011_SSC.tar.gz	1.13 GB
TSX_20110813T184745.444_Iceland_C139_O041_A_R_SM011_SSC.tar.gz	1.12 GB

GFOI – Data acquisitions

TerraSAR-X archive data

- Acquisitions (mostly StripMap) since 2008 over selected sites
- Data collection from 1Q 2008 to 1Q 2015: <http://gfoi.org/RD>.
- Archive data < Q1 2015 via DLR EOWEB

TerraSAR-X background mission

- Background mission since June 2015 to cover the R&D sites systematically
- Prio 1 sites every 22 days, ascending and descending orbit.
- Prio 2 sites monthly
- Status of acquisitions via DLR EOWEB

TanDEM-X archive data

- Acquisitions over selected sites since 2011
- KML of super sites available on GFOI website: <http://gfoi.org/RD>
- Data from the TanDEM-X science phase AO (Oct.2014 – Dec. 2015) include bistatic and/or polarimetric acquisitions over GFOI sites



GEOGLAM & Polar Space Task Group

ASIA RICE

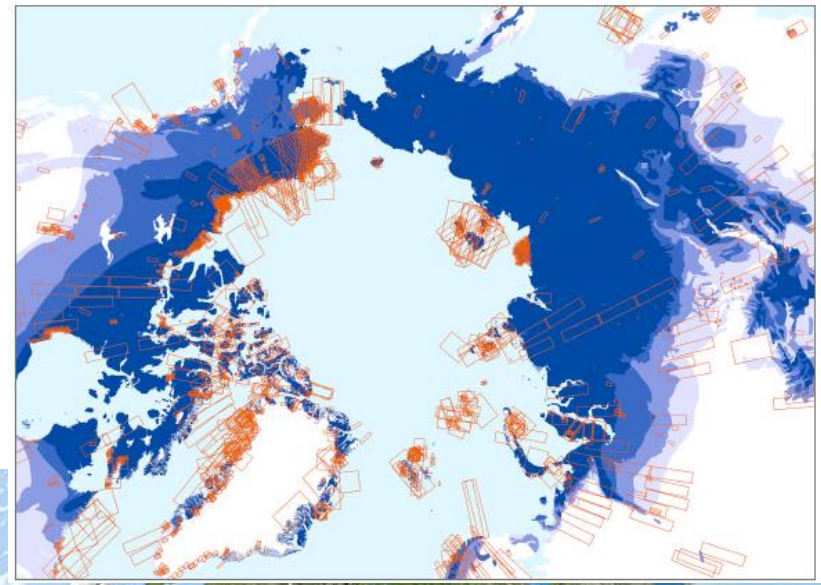
- 42 TSX data sets provided
- Time series of different data sets to monitor rice area, development state and other parameters

JECAM sites

- Data available for sites in Argentina, Belgium, Tunisia
- Further sites to be included upon request
- Data access through TerraSAR-X/TanDEM-X science service systems

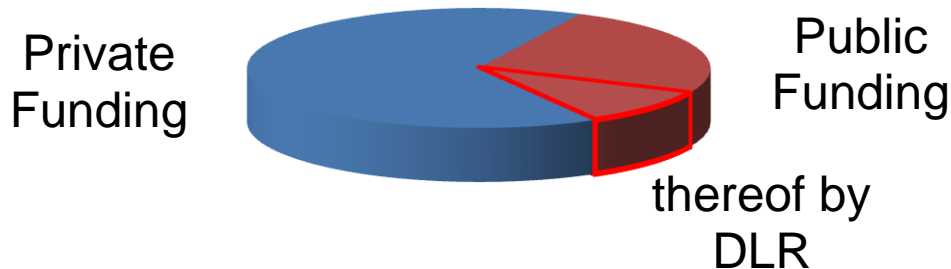
Polar Space Task Group

- Data collection of TerraSAR-X
- TanDEM-X DEM coverage: data acquisition complete
- Access through general AO processes

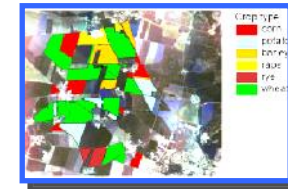


RapidEye

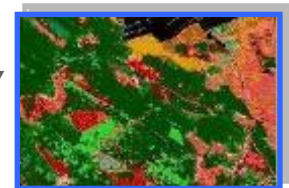
- Commercial initiative with financial support from DLR
- Five identical small satellites in one orbital plane
- CCD Camera, build by JenaOptronik
 - 5 spectral bands & spatial resol.: 6.5 m
 - Strip width: 78 km
 - Launch: August 29th, 2008
- Mission target: regular monitoring of large areas, daily repetition
- Balance for public contribution
 - New jobs
 - Data for Scientists



Crop Maps





Forestry



RESA – RapidEye Science Archive

- General AO for scientific use
- German PI is mandatory
- Registration and proposal submission
- Evaluation wrt to scientific objective and feasibility
- Amount of data restricted

BASIC PRODUCT 1B	ORTHO PRODUCT 3A
<ul style="list-style-type: none">+ radiometric corrected+ sensor Corrected+ 6.5 m pixel size+ 5 spectral Bands	<ul style="list-style-type: none">+ radiometric corrected+ sensor corrected+ geometric corrected+ 5 m pixel size+ 5 spectral bands+ 25 x 25 km tile size
	



BlackBridge
a Planet Labs Company

STARTSEITE NUTZUNGSINFORMATIONEN PROJEKTE & WORKSHOP LINKS FAQ SITE MAP



RESA - RapidEye Science Archive

| EyeFind RESA | Registrieren |

- Startseite
- RapidEye Satellitenkonstellation
- Nutzungsinformationen
- Wissenschaftliche Nutzung
- Bestellbedingungen
- Projektantrag & Verfahren

DAS RAPIDEYE SCIENCE ARCHIVE

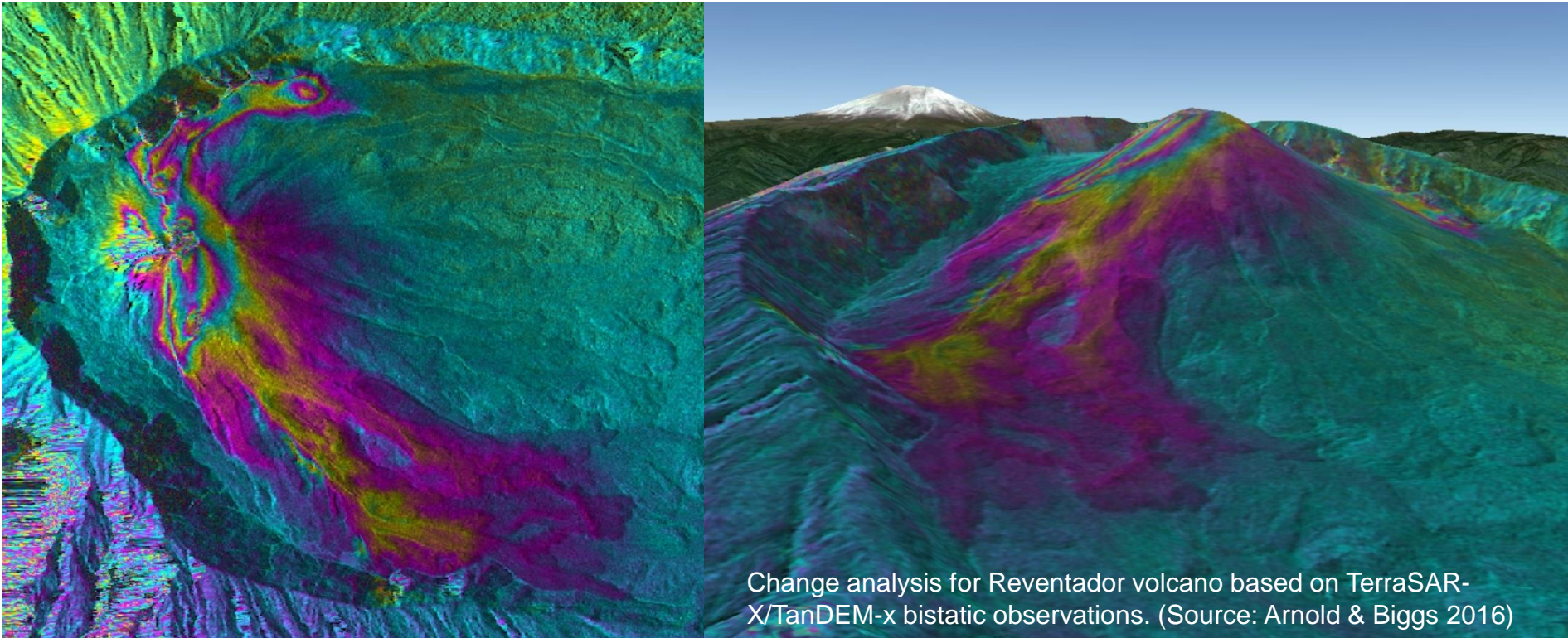
Das RapidEye Science Archive (RESA) unterstützt Wissenschaftler/innen deutscher Universitäten und Forschungseinrichtungen durch die Bereitstellung kostenloser Satellitenbilder der **RapidEye-Konstellation**.

Die RapidEye-Satelliten und der RapidEye-Katalog werden von der BlackBridge AG (<http://blackbridge.com/rapideye/>) betrieben. Die RapidEye-Flotte umfasst fünf baugleiche Satelliten, die die Erde in einer Höhe von 630 km umkreisen. Das System bietet folgende Vorteile:

Thank you

Links to data access for science:

- <http://sss.terrasar-x.dlr.de/>
- <https://tandemx-science.dlr.de/>
- <https://resa.planet.com/>



Change analysis for Reventador volcano based on TerraSAR-X/TanDEM-x bistatic observations. (Source: Arnold & Biggs 2016)