

→ BALTIC FROM SPACE WORKSHOP

29–31 March 2017 | Helsinki, Finland



Forestry TEP

Renne Tergujeff

VTT Technical Research Centre of Finland Ltd

Objective of Forestry TEP (F-TEP)

***"One-stop shop for forestry remote sensing services
for the academic, public and commercial sectors"***

- Moving away from model where each user works in their own 'silo'
- Community centric
- Reduce the costs of data acquisition from misc. sources with varying formats and processing levels
- Self-service environment with support



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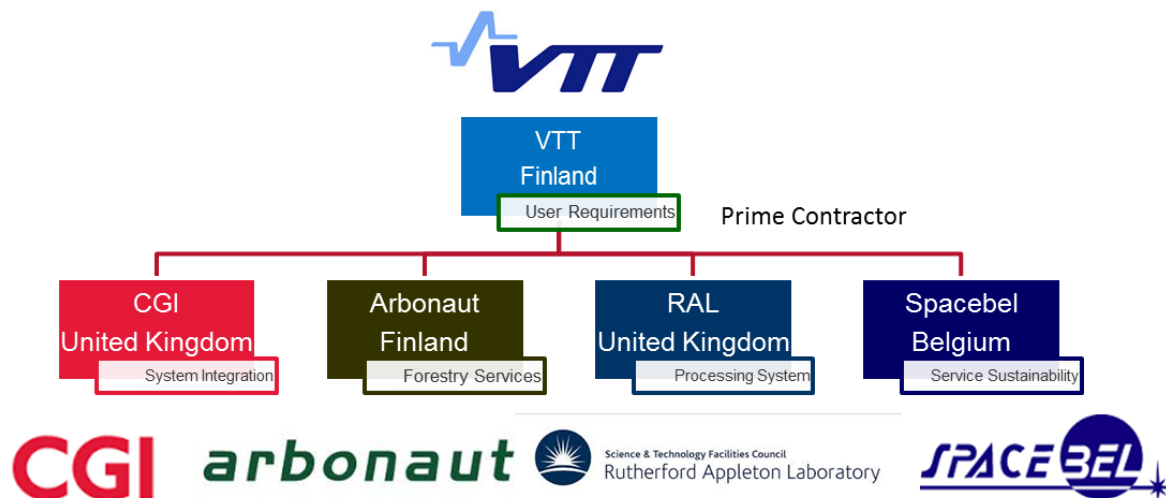
Forestry TEP Project

- One of the six TEPs funded by ESA
- **Timeline:** March 2015 - September 2017; warranty period until March 2018
- **Completed work:** User community survey, System design, Detailed design etc.
- **On-going work:** System implementation, data and service agreements, pilot project preparation, sustainability development
- **Currently: early test use with agreed users**
- **Pre-operational services:** Forestry community (Around May 2017)
- Targeting operational services after the project duration

F-TEP project website: <http://forestry-tep.eo.esa.int/>



The F-TEP project team



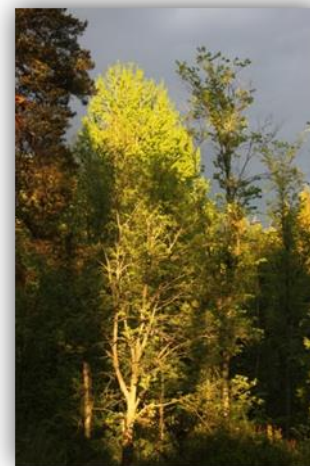
Infrastructure and data services:



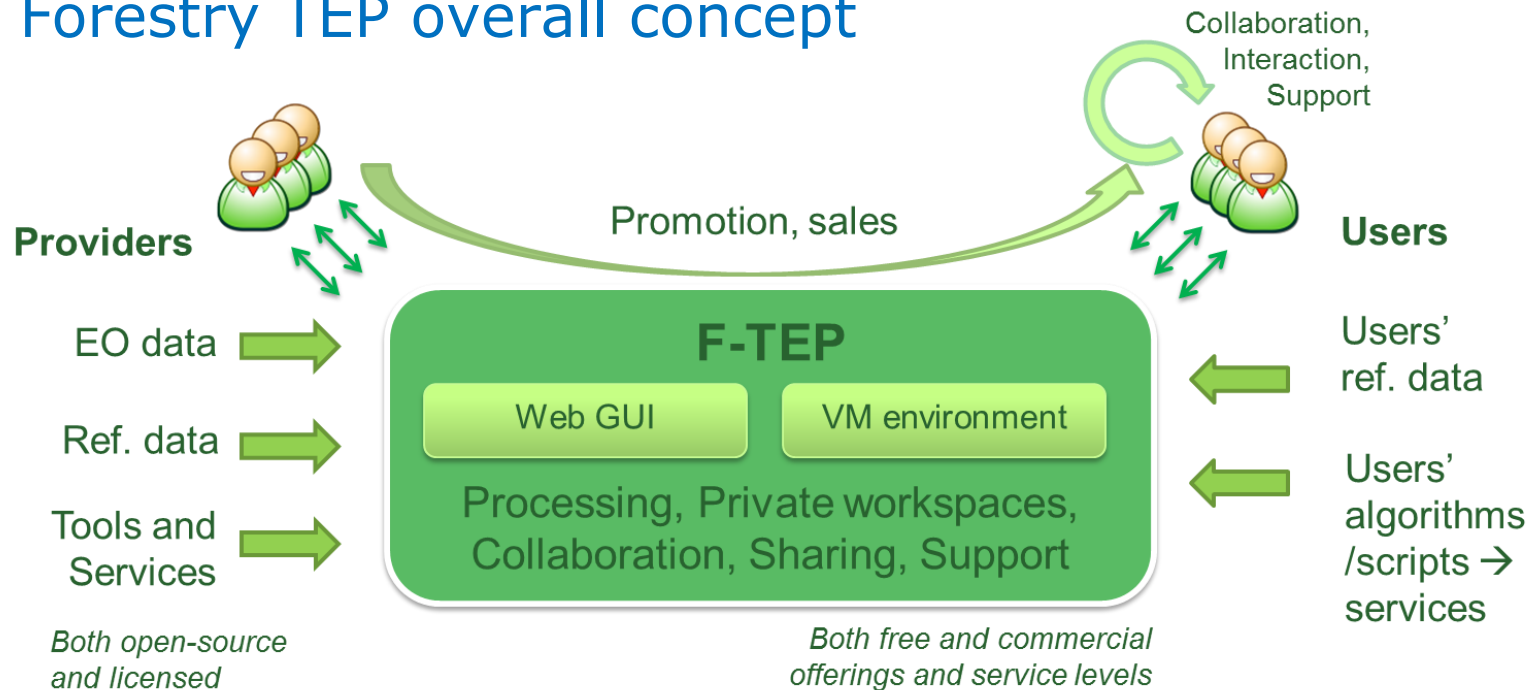
F-TEP User communities

User Type	F-TEP Message
Forest and climate research & development community	Focus on science
Large forest owners and managers	Forest information without burden
Forest certification organizations	Big picture on forest
Regional/national forest administration	Forest at your fingertips
UN organizations	Support for sustainable forest management
International Initiatives, research programs and panels	Big picture on forest
International development banks	Knowing forest value
Sustainable development NGOs	Today's information on forest state
Value adding (SME) industries and consultants	Global market for your services
International administrations and agencies	Marketplace for your data and information

Overall message:
**One-stop Shop for Forestry
 Earth Observation Services**



Forestry TEP overall concept



Platform functionality

- Access to relevant EO data
- Efficient data exploitation
- Toolboxes, services
- Use of (own) in-situ data
- Very simple user interface and procedure for basic tasks
- Advanced features for more complex tasks
- Accuracy assessment (RMS errors, confusion matrices)
- Visual analysis
- Data management
- Service development
- Sharing/licensing products & services
- Accounting
- Collaborative working
- Community features, forum
- Support helpdesk
- **Usage scenarios**



Usage scenarios

1. EO Data Exploitation

- Generation of products (primarily for the user himself)
- Exploitation using the available processing and visualization tools

2. New EO Service Development

- Creation of a new processing service
- Possible to publish and sell the service also for others

3. New EO Product Development

- Generation of new products for publishing
- Ready-made products available on the platform



Data sources - TBC (free of charge and commercial)

- Sentinel-1
- Sentinel-2
- Landsat-5/7/8
- ERS-1/2 SAR
- Envisat ASAR
- DEM (various)
- ALOS PALSAR
- JERS
- Pleiades
- Spot
- SAOCOM (future)
- RapidEye



Services and tools

- SNAP - Sentinel toolboxes
- Monteverdi / Orfeo toolbox
- QGIS
- Open Foris
- Preprocessing, ortho-rectification, and radiometric and geometric correction tools
- VTT services AutoChange, Probability, Envimon
- Further services
- Possibly output of other projects, such as:
 - ESA: Innovators III AccuCarbon
 - ESA DUE GlobBiomass
 - ESA: Innovators III SAR for REDD



Core users in the preoperational phase

- Ministry of Environment and Natural History, State Government Chiapas, Mexico
 - Forestry Development
- Juarez University of Durango State, Mexico
- CONAFOR – National Forestry Commission, Mexico
- FAO – Food and Agriculture Organization of the UN
 - Forestry Assessment, Management and Conservation
- JRC – Joint Research Centre of EC
 - Forest Resources and Climate Unit
- GFOI – Global Forestry Observations Initiative
- UN-REDD – the UN Programme on Reducing Emissions from Deforestation and Forest Degradation
- Metsäkeskus – The Finnish Forest Centre
- SME's part of the consortium



Pilots in Mexico and Finland



Mexico: Monitoring of forest carbon



Finland: Mapping of harmful broadleaved shrubs in regeneration areas



Pilot projects

	Pilot 1 (Mexico)	Pilot 2 (Finland)
Region	Chiapas and Durango states	Finland
Area covered	73,311 km ² (Chiapas) and 123,317 km ² (Durango)	338,424 km ² (TBD according to user preferences)
Theme	Monitoring of above ground biomass and quantifying associated carbon stocks for climate change reporting	Operational forest management; mapping undesired broadleaved tree shrubs on forest regeneration areas
Key outputs	Forest cover mapping and change detection	Map on degree of shrub damage on regeneration areas
Key data used	Sentinel-1 SAR, Sentinel-2 optical (one state)	Sentinel-2 Optical
In-situ data	1: Durango university ground sample network 2: From ESA pilot project EducEO 3: Optionally NFI plots from Chiapas	Forestry Centre's stand database Collected by Forestry Centre during standard field work
Key users involved	Ministry of Environment and Natural History of the state government of Chiapas University of Durango Mexican NGO's (several) ESA nominated users	Finnish Forest Centre (part of Ministry of Agriculture and Forestry) ESA nominated users



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academic, operational public and
commercial sectors**

Contact

forestry-tep.eo.esa.int

Tuomas Häme

tuomas.hame@vtt.fi
+358 40 587 0631

Renne Tergujeff

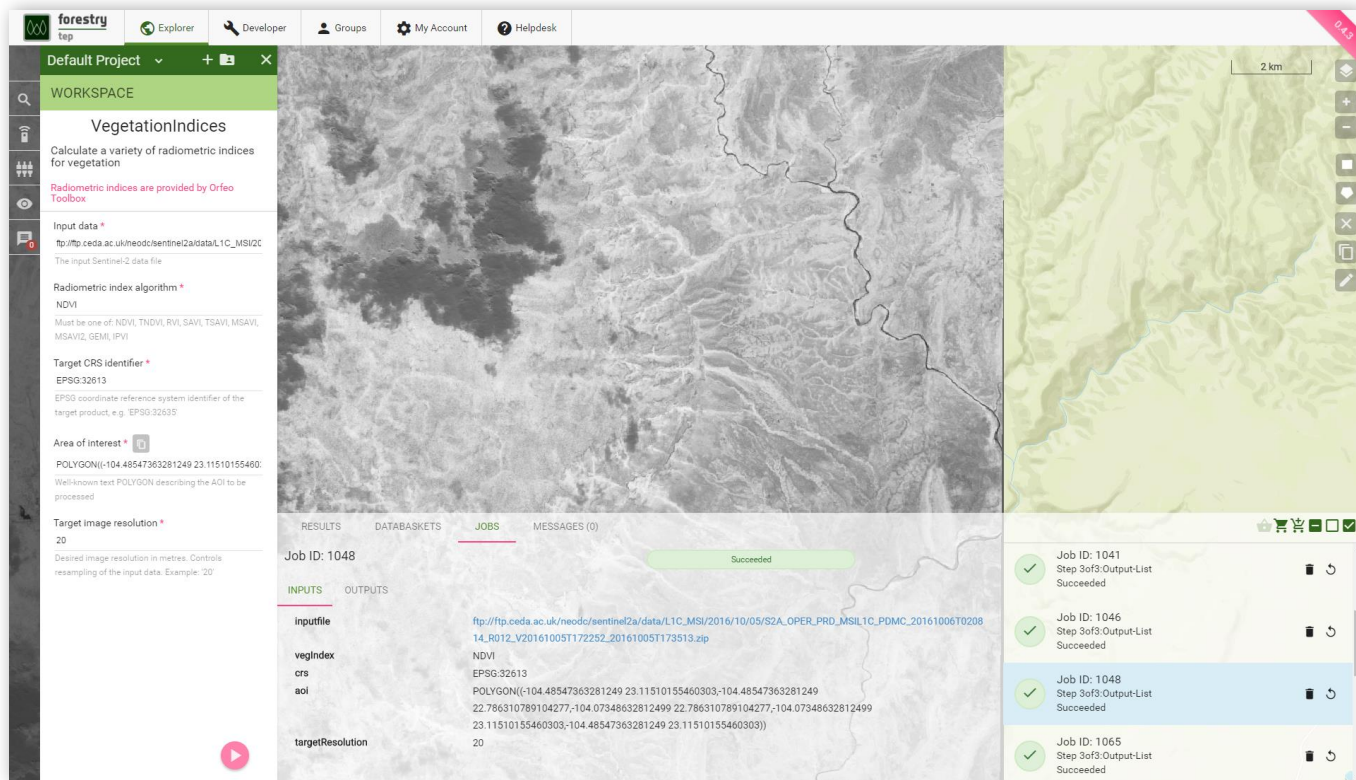
renne.tergujeff@vtt.fi
+358 40 501 7057

In the photo, with permission: Daniel Vega / Universidad
Juárez del Estado de Durango, a Forestry TEP pilot user

LIVE DEMO

- The Forestry TEP platform was presented live during the session in its current development version.
- The demo included introductions of:
 - User interface and AOI tools
 - Sentinel-2 data search
 - Processing services and tools currently available
 - NDVI calculation over an area in Durango, Mexico
 - Viewing the result on the map interface (on the next slide)





forestry.tep Explorer Developer Groups My Account Helpdesk

Default Project + X

WORKSPACE

VegetationIndices

Calculate a variety of radiometric indices for vegetation

Radiometric indices are provided by Orfeo Toolbox

Input data *

`ftp://ftp.ceda.ac.uk/needs/sentinel2a/data/L1C_MSI/2016/10/05/S2A_OPER_PRD_MSIL1C_PDMC_20161006T020814_R012_V20161005T172252_20161005T173513.zip`

The input Sentinel-2 data file

Radiometric index algorithm *

NDVI

Must be one of: NDVI, TNDVI, RVI, SAVI, TSAVI, MSAVI, MSAVI2, GEMI, IPVI

Target CRS identifier *

EPSG:32613

EPSG coordinate reference system identifier of the target product, e.g. 'EPSG:32613'

Area of interest *

POLYGON((-104.48547363281249 23.11510155460303, -104.48547363281249 23.11510155460303, -104.48547363281249 23.11510155460303, -104.48547363281249 23.11510155460303))

Well-known text POLYGON describing the AOI to be processed

Target image resolution *

20

Desired image resolution in metres. Controls resampling of the input data. Example: '20'

RESULTS DATABASKETS JOBS MESSAGES (0)

Job ID: 1048

INPUTS OUTPUTS

INPUTS	OUTPUTS
inputfile	<code>ftp://ftp.ceda.ac.uk/needs/sentinel2a/data/L1C_MSI/2016/10/05/S2A_OPER_PRD_MSIL1C_PDMC_20161006T020814_R012_V20161005T172252_20161005T173513.zip</code>
vegindex	NDVI
crs	EPSG:32613
aoi	POLYGON((-104.48547363281249 23.11510155460303, -104.48547363281249 23.11510155460303, -104.48547363281249 23.11510155460303, -104.48547363281249 23.11510155460303))
targetResolution	20

Jobs List:

- Job ID: 1041 Step 3of3: Output-List Succeeded
- Job ID: 1046 Step 3of3: Output-List Succeeded
- Job ID: 1048 Step 3of3: Output-List Succeeded**
- Job ID: 1065 Step 3of3: Output-List Succeeded