



Hungarian Space Office Liaison Report

HSO update with insight into MFTTT WG4SDG, EO industry
and a CollGS developed for the benefit of the Public Administration

Presented by Gábor Remetey-Fülöpp Dr.

Delegated to the CEOS WGISS by the Hungarian Space Office (HSO)

National GEO Correspondent

Founding member of MFTTT WG4SDG



- About the Hungarian Space Office
- MFTTT WG4SDG Activities – an update
- The Hungarian Space Industry cluster HUNSPACE
- Industrial players of HUNSPACE's EO domain and beyond
- Development of a CollGS for the benefit of Public Administration
- Further relevant news
- Acknowledgements

About the Hungarian Space Office

- Flashback
 - **Established in 1992**
 - **Joined the Ministry of National Development in 2010**
 - **Became a department of that Ministry in 2014**
 - **Hungary joined the ESA in February 2015**
 - HSO and the supervision of the Hungarian space activity **moved to the Ministry of Foreign Affairs and Trade on May 22 2018**
 - Closing Workshop, Hungary-ESA PECS projects in October 2018
- Update since the WGISS 46
 - **Appointment of a Ministerial Commissioner responsible for supervision of space activity:** Ms. Orsolya Ferencz PhD
[Order 27/2018. \(X. 30.\) KKM](#) Nov 1 2018
 - **Establishment of the Department of Supervision of Space Activity** at MoFAT by Nov 1 2018
 - A 2.3 bn HUF budget for the space research and space activities has been approved. Government Decree 1133/2019. (III. 18.) in March 2019



<https://documentcloud.adobe.com/link/track?uri=urn%3Aaaid%3Ascds%3AUS%3Aa9ca1a08-c714-4b9a-a124-2905e588c6ee>





About the Hungarian Space Office

Recent developments and the way forward

- Re-setting the **Scientific Council on Space Research - ÚTT**

(Board having acknowledged experts of the space sciences and users of space-related technologies)

Anticipated completion: 2019 Q2



Informal meeting of the Scientific Council on Space Research hosted by MoFA&T Budapest, Dec 7, 2018

- Re-setting the **Hungarian Space Board - MÚT**

(Board having delegated members of line ministries, government organizations and agencies)

Anticipated completion: 2019 Q2

- Establishment of a new, comprehensive **National Space Strategy**

(incl. Earth Observation. Engagement in international activities is among the priorities)

Anticipated completion: 2019 Q4

Portal providing news on Hungarian space activities
<https://www.urvilag.hu/>

HSO accessibility:
space@mfa.gov.hu
+36 1458-1696
POC: Mr. Ferenc Horvai
Postal address:
Ministry of Foreign Affairs & Trade, Department of Space Activity

MFTTT WG4SDG Activities – an update Activities in the past 6 months



MINISTRY OF
FOREIGN AFFAIRS AND TRADE
OF HUNGARY

Mission: to strengthen stakeholders' engagement, collaboration, capacity building in use of GEO/GI for SDGs

- Last MFTTT WG4SDG update in the HSO Liaison report to WGISS-46 emphasized the EO Academic and scientific players
- MFTTT WG4SDG member delegated by HSO attended the **EO4SDG Side Event at GEO Week 2018** and GEO Plenary in Kyoto, and attended regularly EO4SDG telecons so far
- ExCom of MFTTT (Hungarian Society of Surveying, Mapping and Remote Sensing) **upgraded the status of WG4SDG** from ad-hoc to normal and co-opted the Chair of the Hungarian Space Industry Cluster HUNSPACE
- MFTTT WG4SDG's offered contribution to the 11th International Symposium of Digital Earth to be held in Florence, and attended **CEOS WGCapD webinar** December 2018
- MFTTT WG4SDG contribution to GEO EO4SDG's Strategic Implementation Plan 2019-2023 and attend & share information on **GEO Data Technology Workshop** April 2019
- **MFTTT WG4SDG lead** Prof. Sz. Mihály delivered a presentation at the GIS Open Conference with topic on '**Capacity building aspects of EO/GI for SDG**'. April 2019

Recent MFTTT WG4SDG update gives **an insight into Hungarian EO industry** emphasizing some key players.



EO4SDG:
EARTH OBSERVATIONS
IN SERVICE OF THE
2030 AGENDA FOR
SUSTAINABLE DEVELOPMENT



Strategic
Implementation
Plan
2019-2023

Oktatás feladatok
a térinformatika és földmegfigyelések terén
a Fenntartható Fejlődési Célok megvalósításáért

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Magyar Földmérési, Térképészeti és Távérzékelési Társaság



HUNSPACE GENERAL INFORMATION

- HUNSPACE- Hungarian Space Cluster
 - Established in 2007
 - Accredited in 2014
 - 37 members (in progress: 2 new members)
 - Annual General Meeting
- SME4SPACE membership
- Purpose: include the most participants of the Hungarian space industry
- Cluster-committee:
 - Representatives of each section of the cluster
 - Satellite components, Electronics, Earth observation, Educational research and dissemination

Credit: P.Hargitai, HUNSPACE



The first Space Industry
Catalog 2014



HUNSPACE-
HUNAGI MoU
April 7, 2010

Members of the cluster-
committee:

Gyöngyvér Lenkeyné
Dr. Bíró (**Educational
research and
dissemination**)

Gyula Horváth
(**Electronics-
Informatics**)

Tamás Bárczy
(**Satellite
components**)

**Chairman: Péter
Hargitai (Earth
observation)**

Honorary member:
Prof. Dr. Pál. Bárczy

HUNSPACE and the
Hungarian Association of
GI 'HUNAGI' signed a MoU
in 2010



EARTH OBSERVATION AIRBUS DS GEO HUNGARY

Data Services

- Access point to multi-source, multi-resolution data and value-added layers, and premium, fresh imagery
- Based on Airbus constellation of satellites, partner satellites and open source data, worldwide off-the-shelf layer
 - Airbus Imagery: Pléiades, SPOT, TerraSAR-X, TandDEM-X radar and DMC Constellation
- Global access to WorldDEM™ Streaming
- In progress: Earth Monitor for track changes over the interested areas, that automatically detect changes





Industrial players of HUNSPACE's EO domain

EARTH OBSERVATION AIRBUS DS GEO HUNGARY

Thematic monitoring services

- Agriculture
 - *Verde*: extraction of biophysical information
 - *Farmstar*: supporting the daily farming decision making
 - *Starling*: for organisations committed to no deforestation
 - Grassland Production Index
- Monitoring Services for Oil, Gas, Mining and Energy
- Monitoring Services for Maritime
- Land Administration Services
 - GIS Data Capture from scanned maps, plans, or other spatial data
 - Managing and supporting organisational change





Industrial players of HUNSPACE's EO domain

EARTH OBSERVATION GEODATA SERVICES LTD.

- Satellite Images Services
 - High precision, multispectral data, 30cm geometrical resolution
 - Sensors: KOMPSAT, Wordview, GeoEye, IKONOS, QuickBird, SkySat
 - Remote Sensing Services
 - State administration, disaster recovery, environmental protection
 - Supporting both agriculture and industry with the most advanced technology
 - Development
 - The development activities are to share the benefits with the participating partners, that can solve their tasks more efficiently
- T-BEA: agricultural biomass monitoring (applied research, EUREKA)



Industrial players of HUNSPACE's EO domain

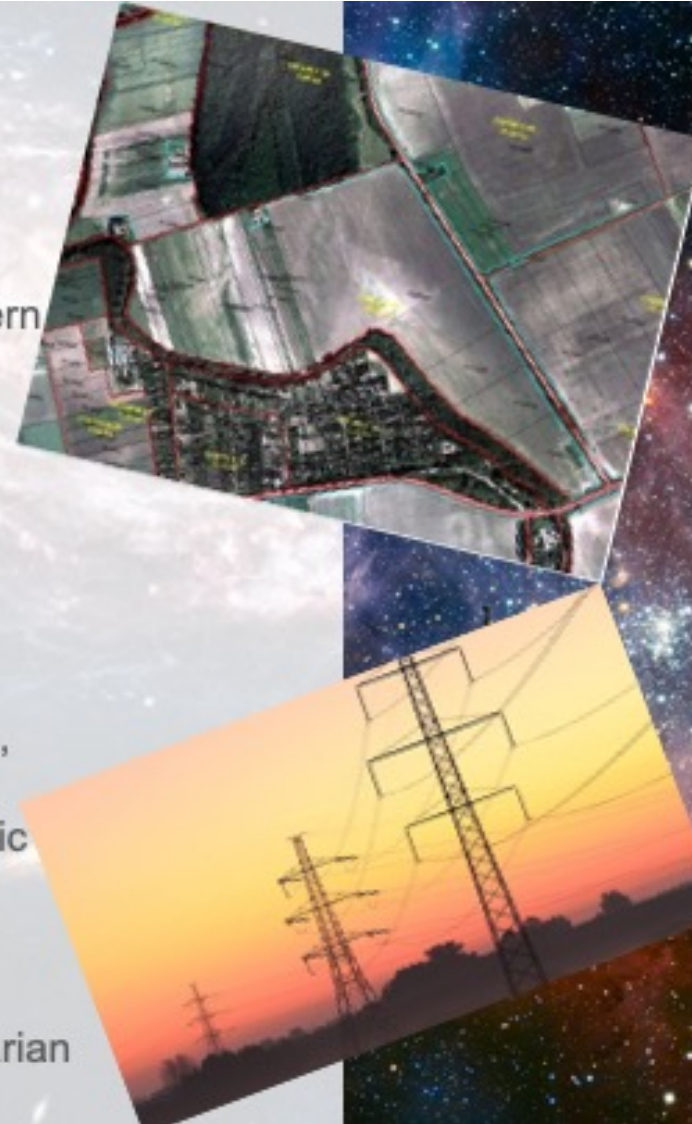


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EARTH OBSERVATION GEODATA SERVICES LTD.

References

- Remote Sensing
 - Land Parcel Identification System, Germany
 - Sachsen-Anhalt, Mecklenburg-Vorpommern
 - Control with Remote Sensing, Germany
 - Brandenburg, Saarland, Mecklenburg-Vorpommern, Sachsen-Anhalt
 - Topographic database for Libyan territories
- Quality Control
 - Quality control of low voltage electricity network and electric shock protection, and gas network database, E.ON, Hungary
 - Quality control of registering security zones of electric wires , ELMŰ-ÉMÁSZ, Hungary
- Utilities and other database services
 - Update of 1:25 000 topographic database for Hungarian Military Mapping Institute



Credit: P.Hargitai, HUNSPACE





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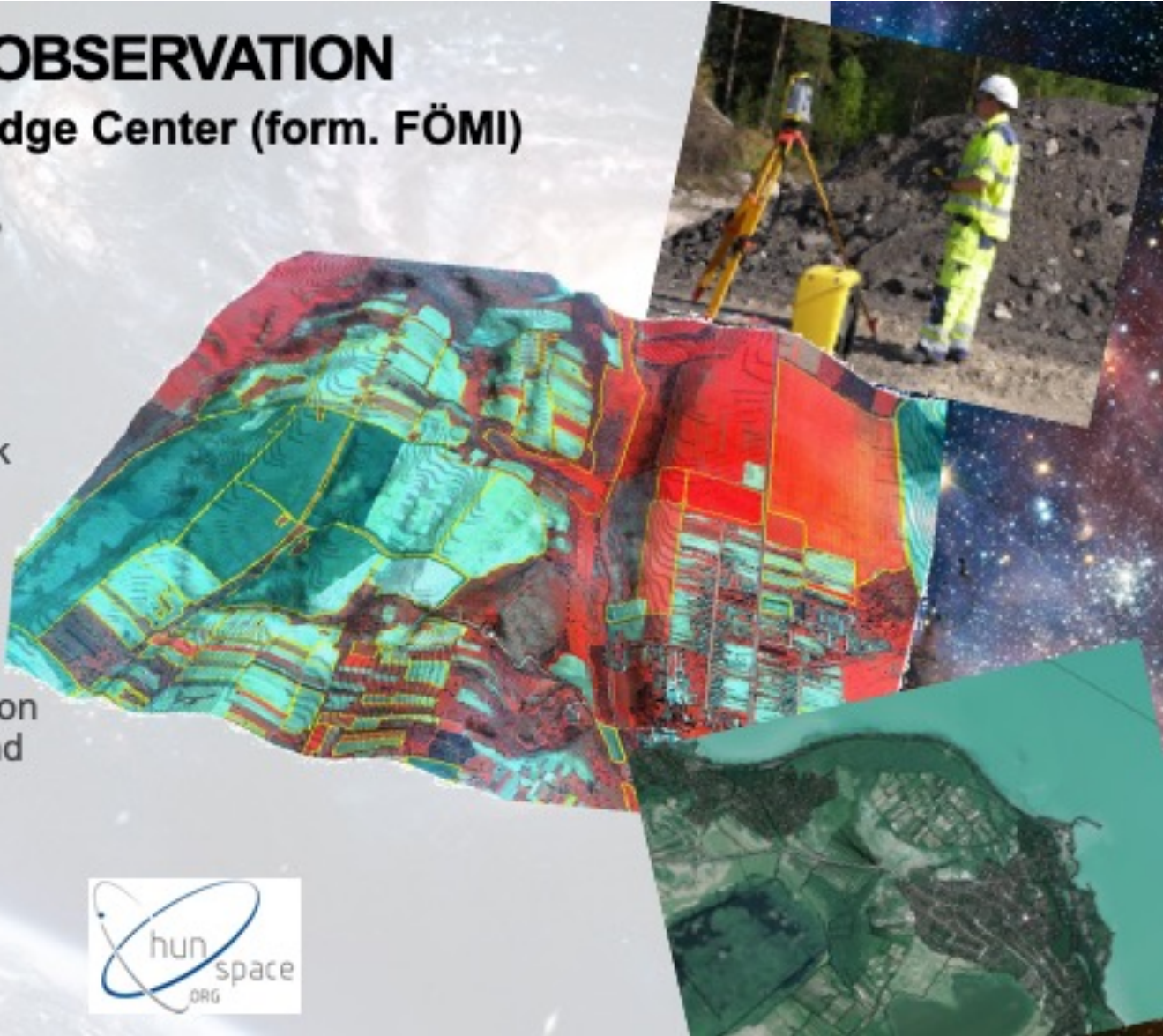
Industrial players of HUNSPACE's EO domain




EARTH OBSERVATION Lechner Knowledge Center (form. FÖMI)

Legal successor of FÖMI (est. 1967),
National Mapping Authority

- Maintainer of national spatial data bases
 - Control point and GNSS network
 - Topographic data base
 - Orthophotos
 - Land administration
- Remote Sensing / Earth Observation activities related to land cover / land use, agriculture and urban applications
- Research and development in the above thematic areas

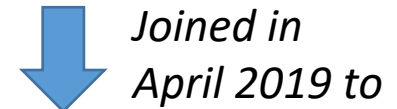


Credit: D.Kristóf, G.Maucha of Lechner KC

FÖMI 
Institute of Geodesy,
Cartography and
Remote Sensing
Incl. Remote Sensing
Center &
Satellite Geodesy
Observatory



BFKH FTFF
Budapest Capital
Government Office
Dept of Surveying,
Geo-informatics and
Land



**Lechner Knowledge
Center**  **11 NP LLC**



Industrial players of HUNSPACE's EO domain

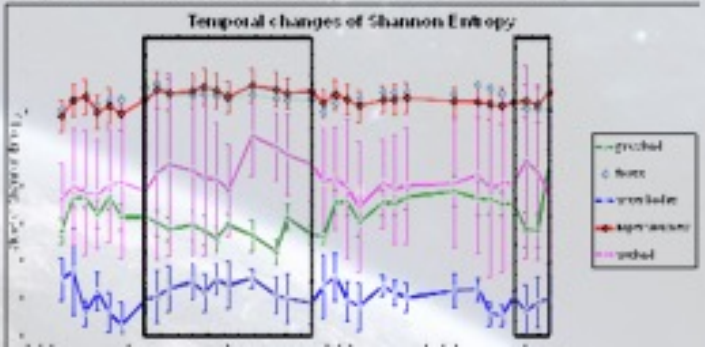
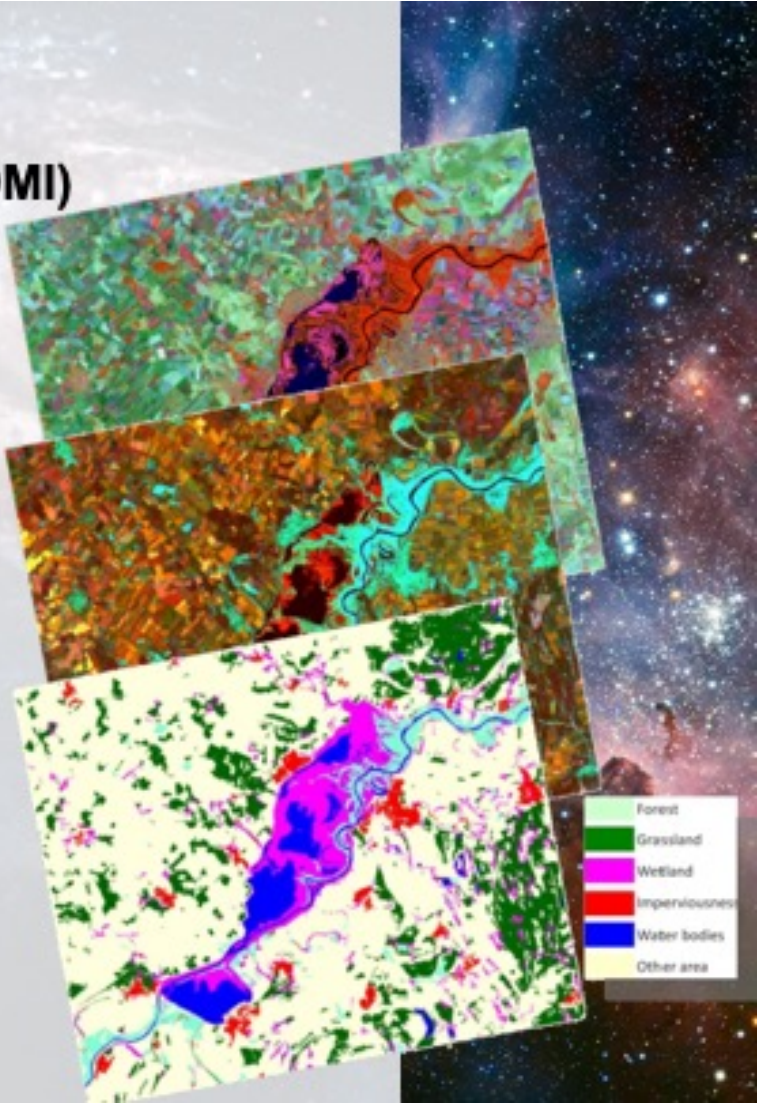


EARTH OBSERVATION

Lechner Knowledge Center (form. FÖMI)

Main competences

- Balanced use of quantitative and visual methods
- Combined use of different data sources
 - Remote Sensing:
 - airborne/space-borne
 - optical and radar (fusion, polarimetry)
 - Field surveys
 - Official: LPIS, cadastre, topography
- Processing of big geospatial data (national, EU)



Int'l engagements
Member of EARSeL,
Cooperation with EEA

Expected impact of the merge: synergy in data integration, validation and deeper assessments. In-situ service left to BKFH FTFF remains accessible

As of April, 2, 2019

Credit: D.Kristóf, G.Maucha of Lechner KC

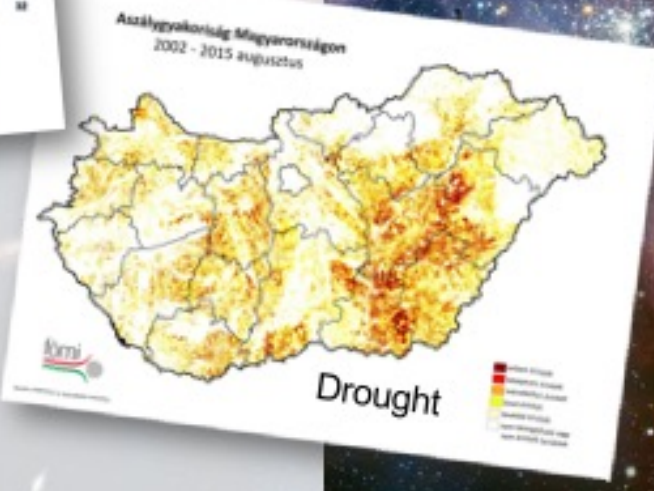
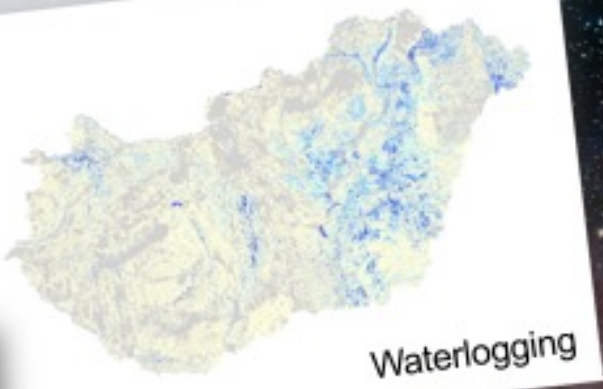
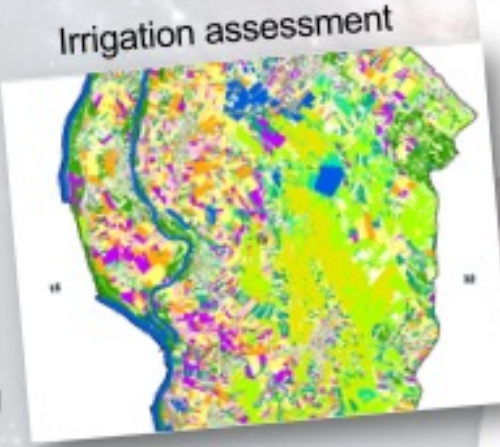


Industrial players of HUNSPACE's EO domain



EARTH OBSERVATION Lechner Knowledge Center (form. FÖMI)

- Agricultural Remote Sensing
 - Continuous developments since the 1980's
- Agricultural Risk Management System (MKR)
 - Operational since 2014
 - Integrated governmental system to assess loss compensation requests
 - Operational provision of waterlogging / inundation and drought products
- Regular provision of country-wide crop and grassland maps
- RS-based assessment of irrigation



MKR

EO sources: Sentinel-1,-2 Landsat, Modis and Proba-V

Results upload by OGC's GML

Competences: logwater mapping 1998-, draught mapping 2013-, MKR since 2014

Contractors: Office of Agric&Rdev and Treasury

Partners: Met Service (OMSZ) and Water Management (OVF)

Expectations from FIR (the Hung. CollGS): preprocessing, ARD

Opensource environments used include SNAP, Python, OSGeo4W

Draught mapping already using GoogleEarthEngine, *Logwater mapping* just start it. Using different CollGS/DIAS as trial is planned. Specifications have been defined for FIR as well.

Metrics on usage: some 10k/year

As of April, 2, 2019

Credit: D.Kristóf, G.Maucha of Lechner KC



Industrial players of HUNSPACE's EO domain

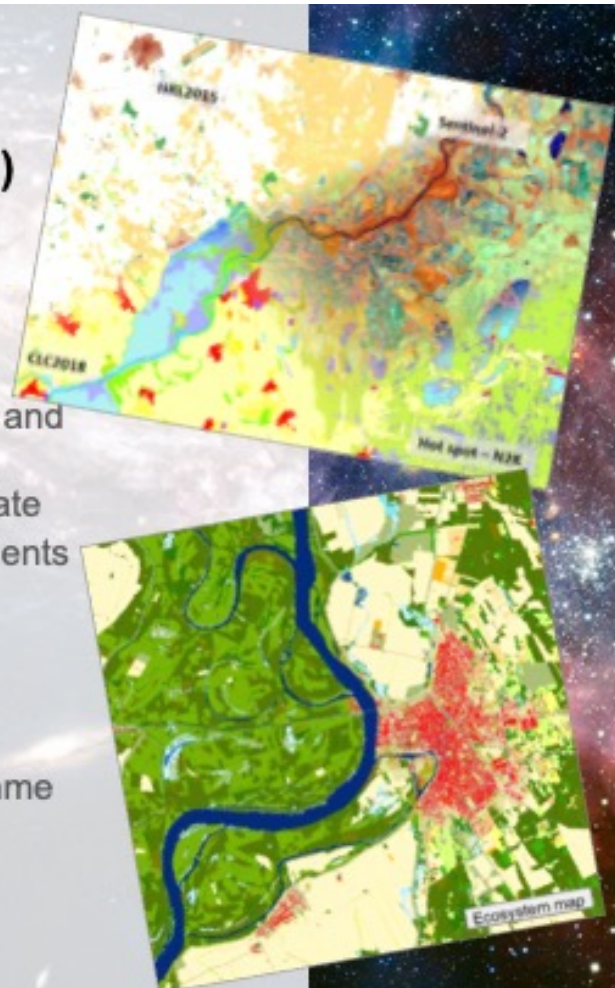


EARTH OBSERVATION

Lechner Knowledge Center (form. FÖMI)

Land cover mapping and monitoring

- Key role in European land monitoring
- Cooperation with EEA (European Environment Agency)
- Member of European Topic Centre – Urban, Land and Soil systems (ETC-ULS)
- Technical coordination of European CLC2018 update
- Quality Assessment and methodological developments
- National Reference Center for land cover
 - National land cover / land use monitoring
- Country-wide mapping and status assessment of ecosystem services
 - In the frames of state nature conversation programme
 - Project led by the Ministry of Agriculture (KEHOP 4.3.0)
 - Contribution from various R&D and operational partners



As of April, 2, 2019

Credit: D.Kristóf, G.Maucha of Lechner KC

NÖSZTÉP

the National Ecosystem Mapping

Source of data: Agricultural Land Parcel (MePar), Soil, Forestry and Cadastral databases

Special features data fusion with data cube technology, access in Python environment which provides flexibility. Results are integrated into Data Cube for *ecosystem mapping*

Data storage in ArcGIS

Competence: consortium with Ministry of Agriculture, and HAS Research Institute of Ecology 2016 onward

Present stage: in validation phase
Relation with FIR (the Hungarian CollGS): requirements from the project perspective: a need for monitoring capabilities

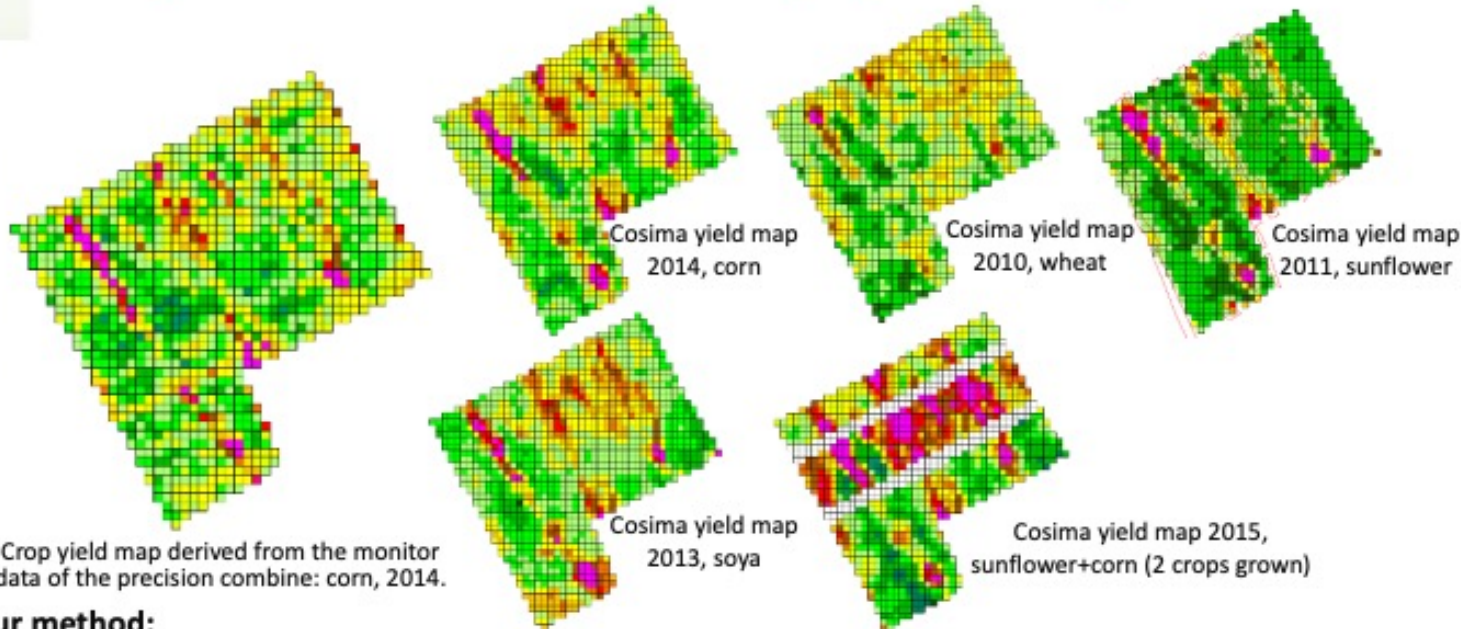
Industrial players beyond of HUNSPACE's EO domain: e.g. COSIMA LLC



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Strong farm support by quantitative information, derived by satellite data

Example: Efficient VRA nutrition of field crops by measured cell yield values



Our method:

- properly measures the crop cells' yields in the given prior years
- provides a thorough spatial-temporal quantitative and absolute yield values overview on the cells and field performance
- this performance reveals the local capability of the farm fields and their 0.04-0.1 ha units: the cells under the crop rotation, affected by the different meteorological profiles in different years,
- so that it allows a quantitative cell capacity data base to be used for nutrition VRA for the next year or for efficient top/side dressing

COSIMA Cosima Ltd., Budapest, Hungary CEO Gábor Csornai, gabor.csornai@cosima.hu +36 30 475-8018

Basic data types applied are optical series of MS satellite data: Landsat OLI plus Sentinel 2A, 2B

Features: unique method for accurate precision cell yield assessment for the main crops

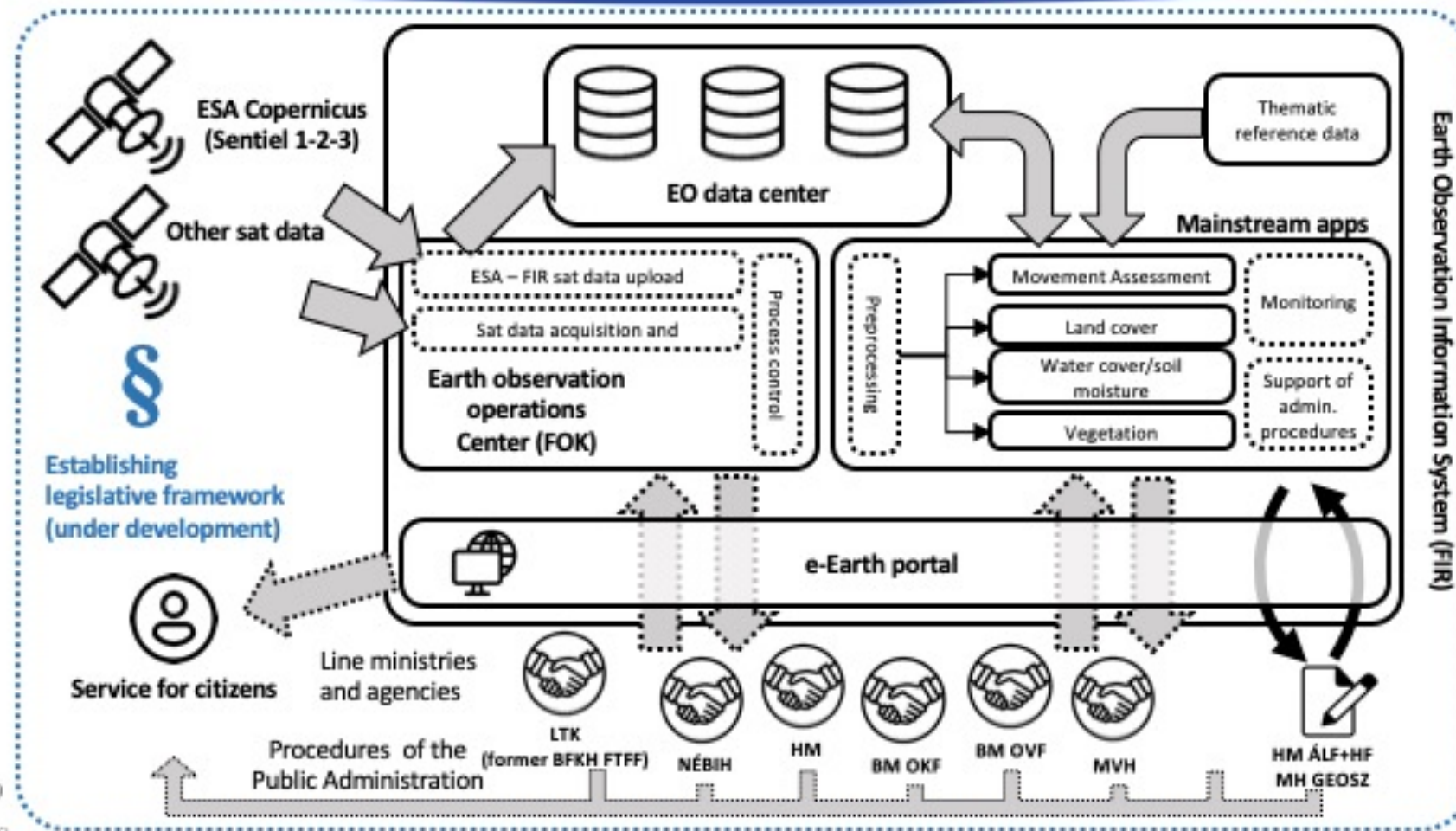
Competence looks back for decades in county plus national crop production assessment (CROPMON 1997-2003) but a special new model has been developed to field and precision scale solutions from 2012,

Development is being pursued to switch to new computing technologies and apply cloud computing for global solutions and massive automation.

Gábor Csornai's profile:

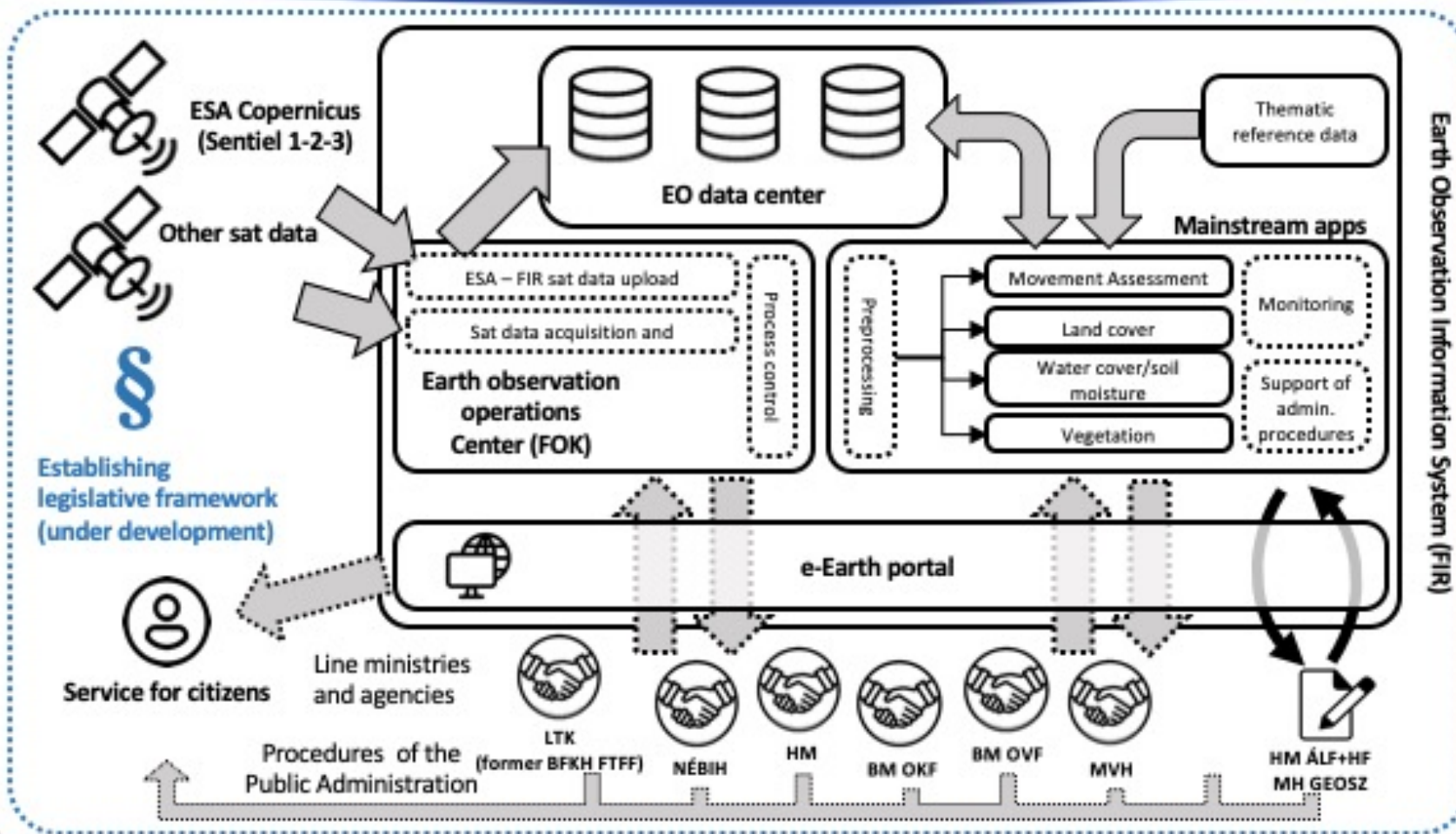
<https://hu.linkedin.com/in/gabor-csornai-024bab23>

Earth Observation Information System (FIR) conceptual model of operation



- **National project on the Development of the Public Administration**
- **Timeframe :2017 – 2020 Q2**
- **Run by Consortium KIFÜ (lead), NISZ and Lechner Knowledge Center (former FÖMI)**
- **In partnership with line ministries and agencies including Ministry of the Interior, Ministry of Agriculture, Ministry of Defence, Lechner KCenter**
- **KIFÜ's activity is supervised by the Ministry of Innovation and Technology**

Earth Observation Information System (FIR) conceptual model of operation



- Mission goal

To provide support by sat EO data and service for the Hungarian Public Administration (line ministries, agencies for the benefit of the users/citizens)

- Components

- EO Op Center (FOK)
- EO Data Center
- Thematic Reference Data
- Applications, Analysis
- Portal e-Earth
- Partners
- Users

SENTINEL collaborative ground segment status is anticipated in April 2019

A comprehensive legislation framework is under establishment

Present readiness is about 25%



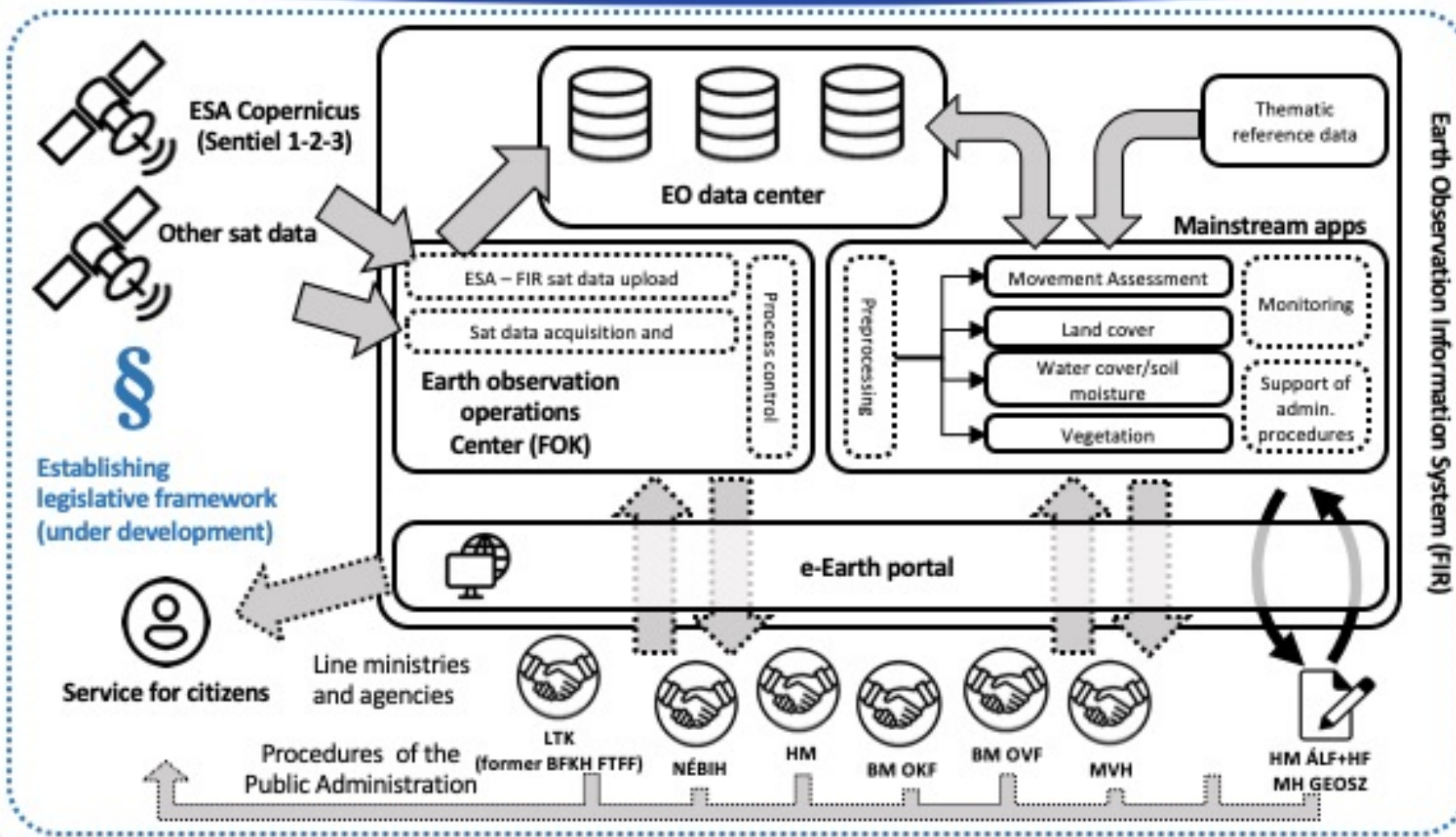
Earth Observation Information System (FIR) conceptual model of operation

Features include

- Raw, preprocessed and analysis ready data as input
- Sat systems: **Sentinel, Modis, Landsat**
- Apps-oriented services: **movement assessments, land cover, water cover and soil moisture, vegetation**

Follow-on plans include

- **Extending capability to host and provide service with geospatial reference data and other thematic data** (subject of Sentinel Ground Segment Collaboration agreement)
- **Populating apps** 18



Credit: P.Maár of KIFU

As of 17 April 2019
Courtesy by
Péter Maár of KISZÜ

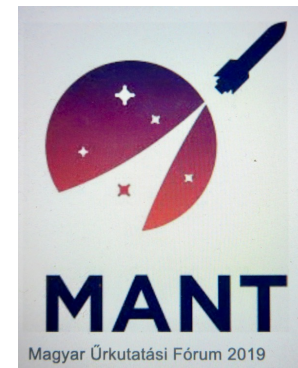
Project: KÖFOP-1.0.0-VEKOP-15-2017-00050

POC: Péter Maár Project Manager, maar.peter@kifu.gov.hu



Some further updates

- **Hungarian Space Research Forum 2019**, Sopron, 24-26 April, 2019 organised by MANT and the Research Center of Astronomy and Geosciences (CSFK) of the Hungarian Academy of Science (MTA), hosted by the Institute of Geodesy and Geophysics (GGI) www.muf2019.hu



Hungarian Astronautical Society (MANT)
Member of IAF since 1959

- **ESA technology transfer office hosted by the Hungarian Academy of Sciences' Wigner Research Centre for Physics** started its third year in February 2019

<https://spacesolutions.esa.int/technology-transfer/esa-broker-hungary>

- First **Open Call of the ESA Business Incubator Center** operated by Wigner closed in March 2019 https://wigner.mta.hu/esa_bic/en/open-call

- **There is a serious consideration to join CEOS** by HSO. Recommendations given by CEOS Executive and WGISS Chair are appreciated and acknowledged.

- It is anticipated, the newly appointed advisory boards (ÚTT/MŰT) of the Ministerial Commissioner will discuss this issue asap. **It is expected, the ministerial commissioner** responsible for the Hungarian space research and space activities **will act based on the advise of the boards in time, well before the WGISS-48** (2019 Q3)

- After WGISS 47, **CEOS WGCapD will be contacted** in order to discuss engagement opportunities for a stakeholder entity named **MFTTT WG4SDG** via HSO.

In-depth look into Hungarian space activities and the players offers the portal

'Űrvilág' (Space World) at <http://www.urvilag.hu/>



Services provided by the ESA Business Incubator Center (BIC) in Hungary



Portal on space research and activities (in Hungarian)



Geo-Sentinel is operator of the portal. Active in satellite geodesy, EO and space sciences

There is a serious consideration to join CEOS by HSO.

Hints related to the procedure we got from CEOS Executive and WGISS Chair are appreciated and acknowledged

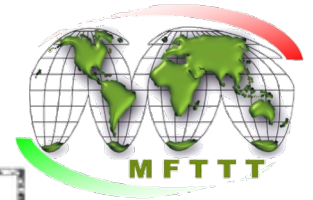
It is anticipated, after the set-up of **the newly appointed advisory boards of the Ministerial Commissioner will discuss this issue soon.**

It is expected, the ministerial commissioner responsible for the Hungarian space research and space activities **will act based on the advise of the boards in time, before the WGISS-48 (2019 Q3)**

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Acknowledgements

- Ferenc **Horvai** HSO/Department of Space Activities, Ministry of Foreign Affairs & Trade of Hungary
- Zoltán **Zboray** Department of Ministry of Innovation and Technology
- Prof. Szabolcs **Mihály** Lead, MFTTT WG4SDG and team members including Tamás **Palya**, Prof. László **Zentai**, Gyula **Iván** and Péter **Hargitai**, Chairman of HUNSPACE
- Dániel **Kristóf** and Gergely **Maucha** of Lechner Knowledge Center (former FÖMI)
- Gábor **Csornai** CEO of COSIMA Ltd
- Péter **Maár**, FIR Project Manager KIFŰ (Governmental Informatics Development Agency)
- Péter **Farkas**, Executive, Geo-Sentinel Ltd.





Thank you!

If you have any questions,
please reach out:
gabor.remetey@gmail.com