



AEROSPACE MONITORING CENTER

MINISTRY OF INTERIOR

COMMUNICATION AND INFORMATION SYSTEMS DIRECTORATE

"Copernicus data and services for floods and fires damage assessment"

"Данни и услуги по програмата Коперник, за оценка на поражения от наводнения и пожари"

Rosen Nazarov

Sofia, 2018



Aerospace Monitoring Center - Overview

AeroSpace Monitoring Center (SMC)

Established in 2007

Purpose and Tasks:

- Receives, process and analyzes Real-time Satellite and variety of ground data
- Informs and warns Civil protection authorities
- Participates in the process of Disaster Risk Management



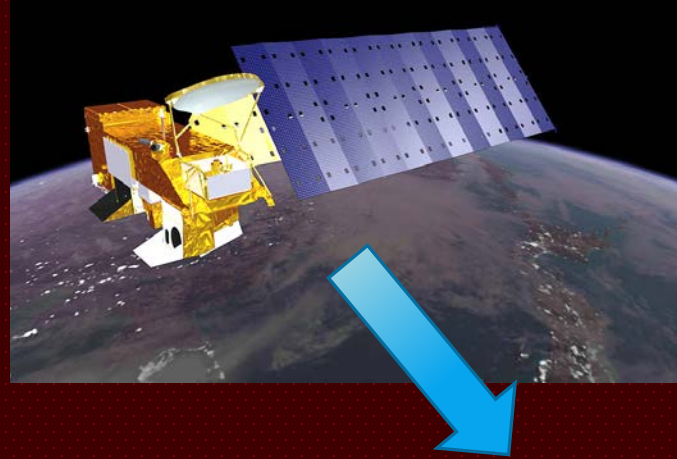
Aerospace Monitoring Center – EU Programs Representative Functions

- National Representative Copernicus Committee
- National Representative GNSS Agency Security Accreditation Board
- Function in 2007/2/EO (INSPIRE) – the Ministry of Interior part
- Contact Point for EMS Activations



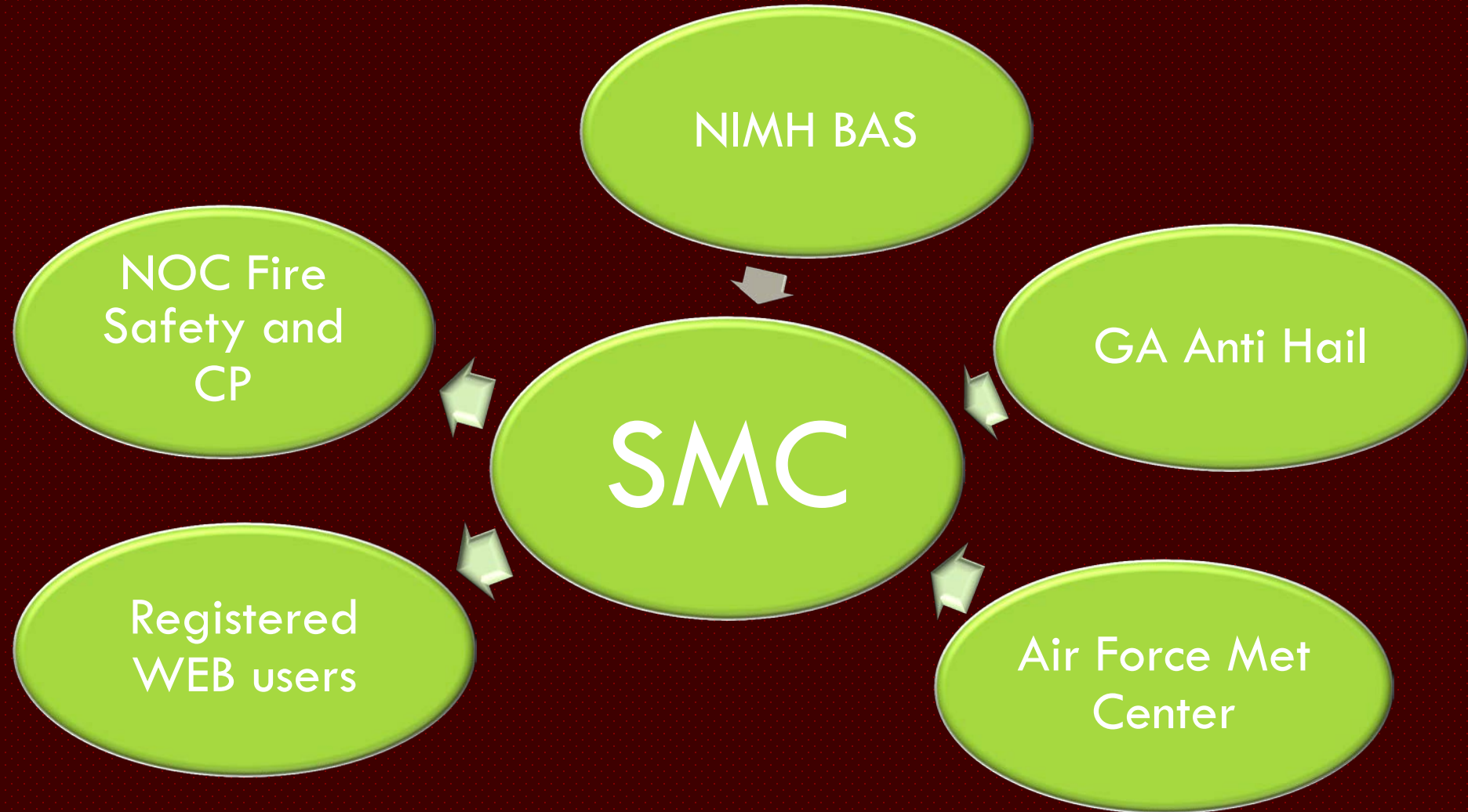
Aerospace Monitoring Center Equipment

- Two Receiving ground stations
- Small datacenter
- Specialized SW revealing different phenomena (Cloud, Rain, Fires...)
- GIS system for analyzes and publishing





Aerospace Monitoring Center - Interaction





Copernicus EMS Activation

EMSN-022 Bulgaria

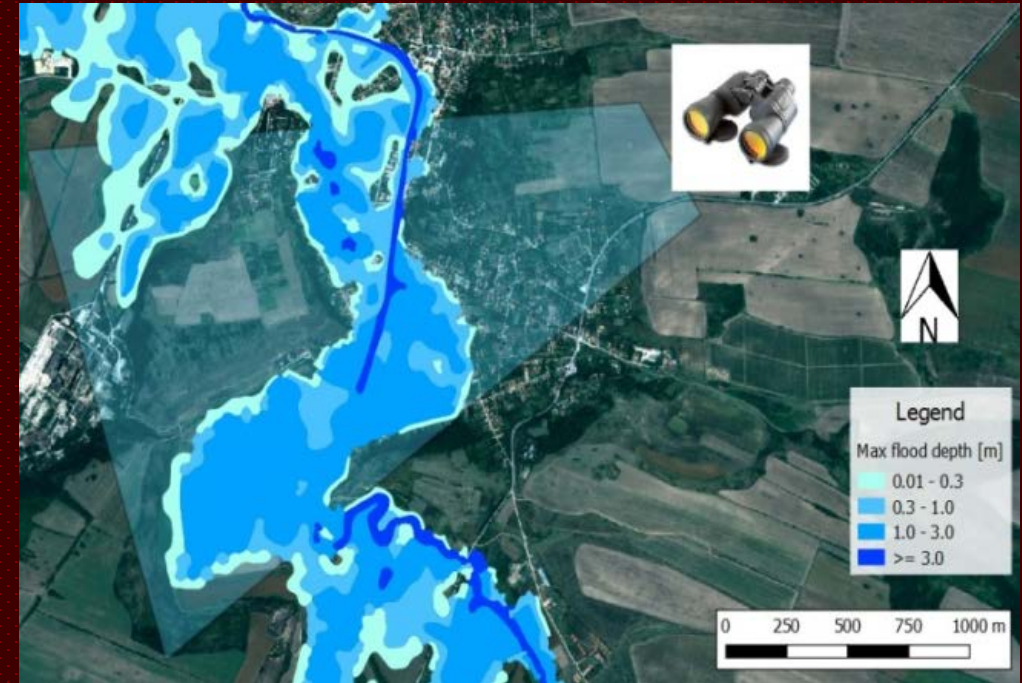
Event Time: 2014-07-31

Activation Time: 2016-05-04

Area: **Mizia town, Bulgaria**

Issued by the Institute for the Protection and Security of the Citizen, Ispra, ITALY , 76 pages Report

- Post-disaster analysis,
- Damage assessment,
- Recovery and rehabilitation planning and monitoring,
- Flood risk assessment,
- Disaster preparedness and response mechanisms





Sentinel 1 GRD – Bregovo Region, Timok river Flood

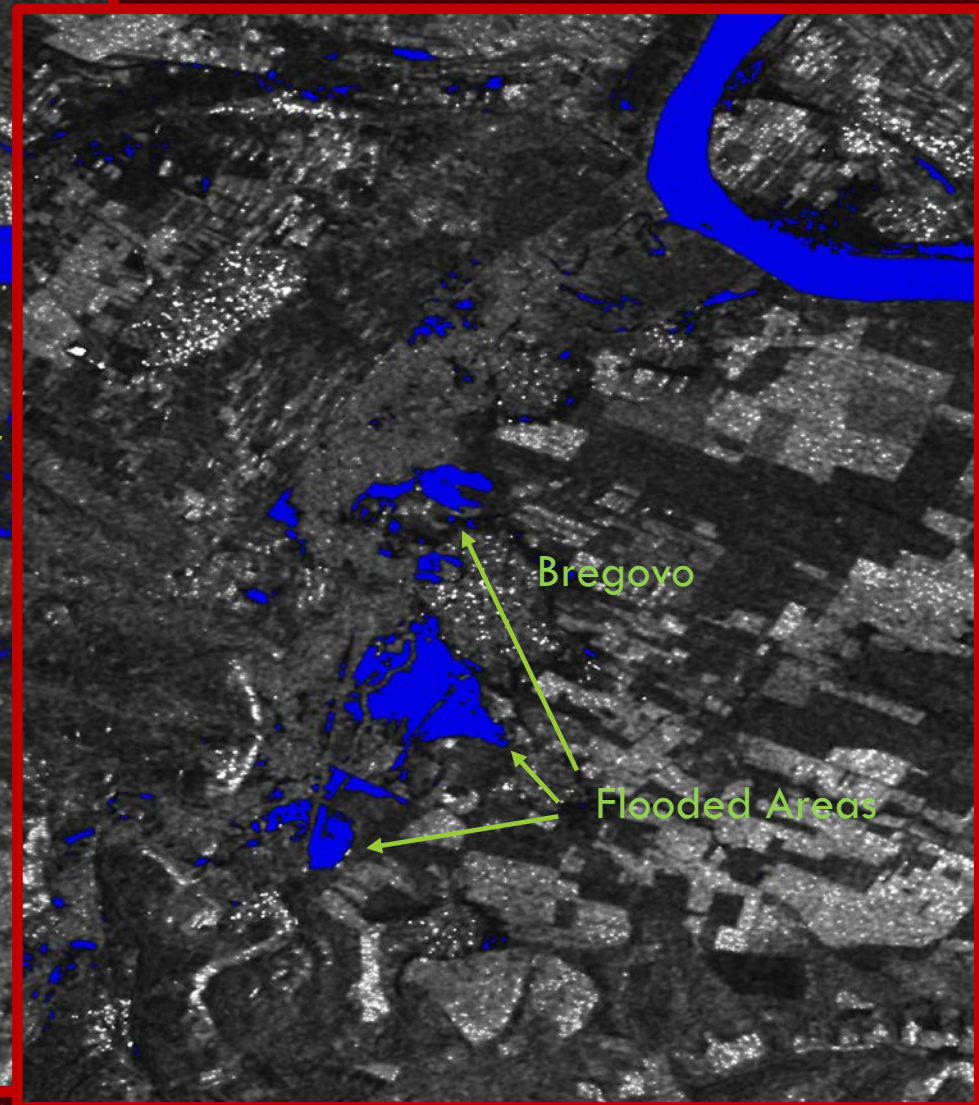
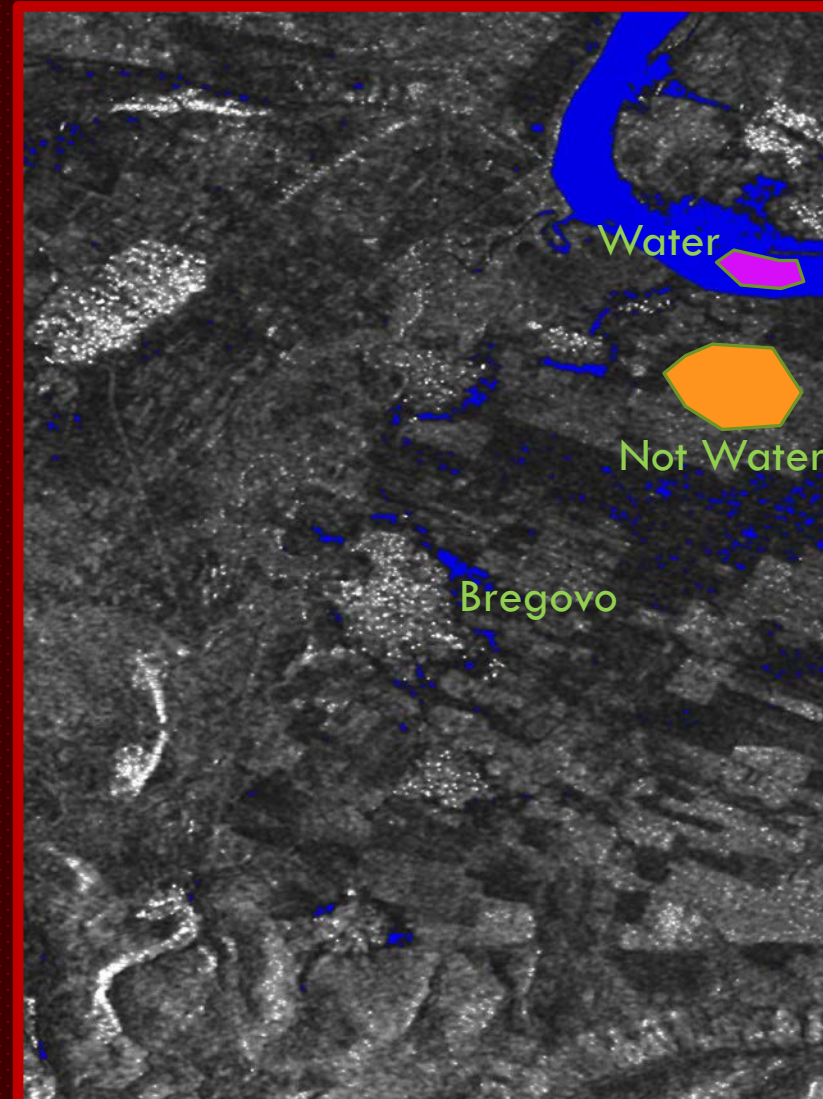
Flood Date-March 11

Reference Date-Feb 28

Date after –March 12

Fast Mapping Process

- Calibration, Ch-Sigma0
- Speckle filtering
- Terrain Correction
- Masking
- Random Forest Classification
- Output the Mask to GIS

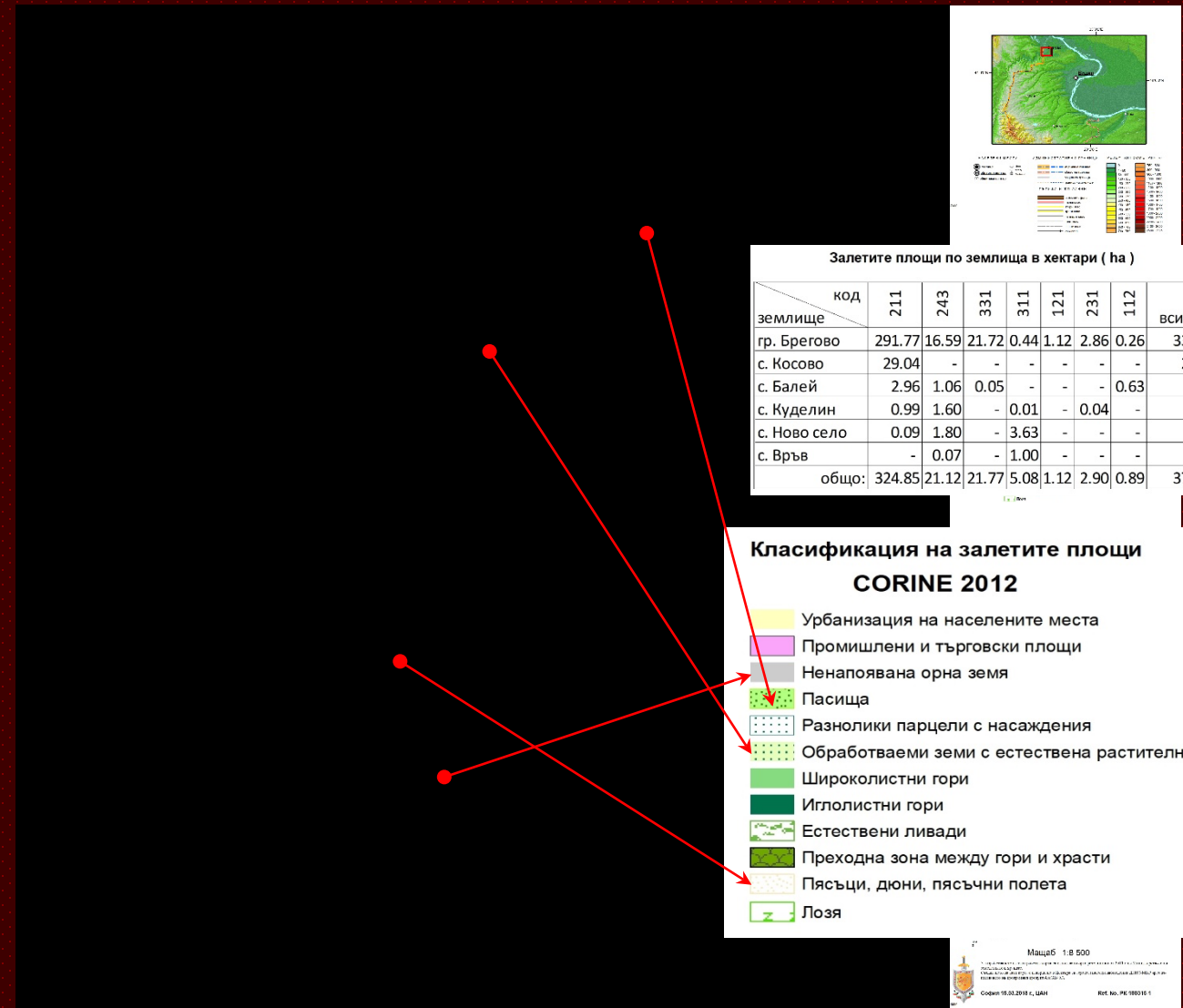
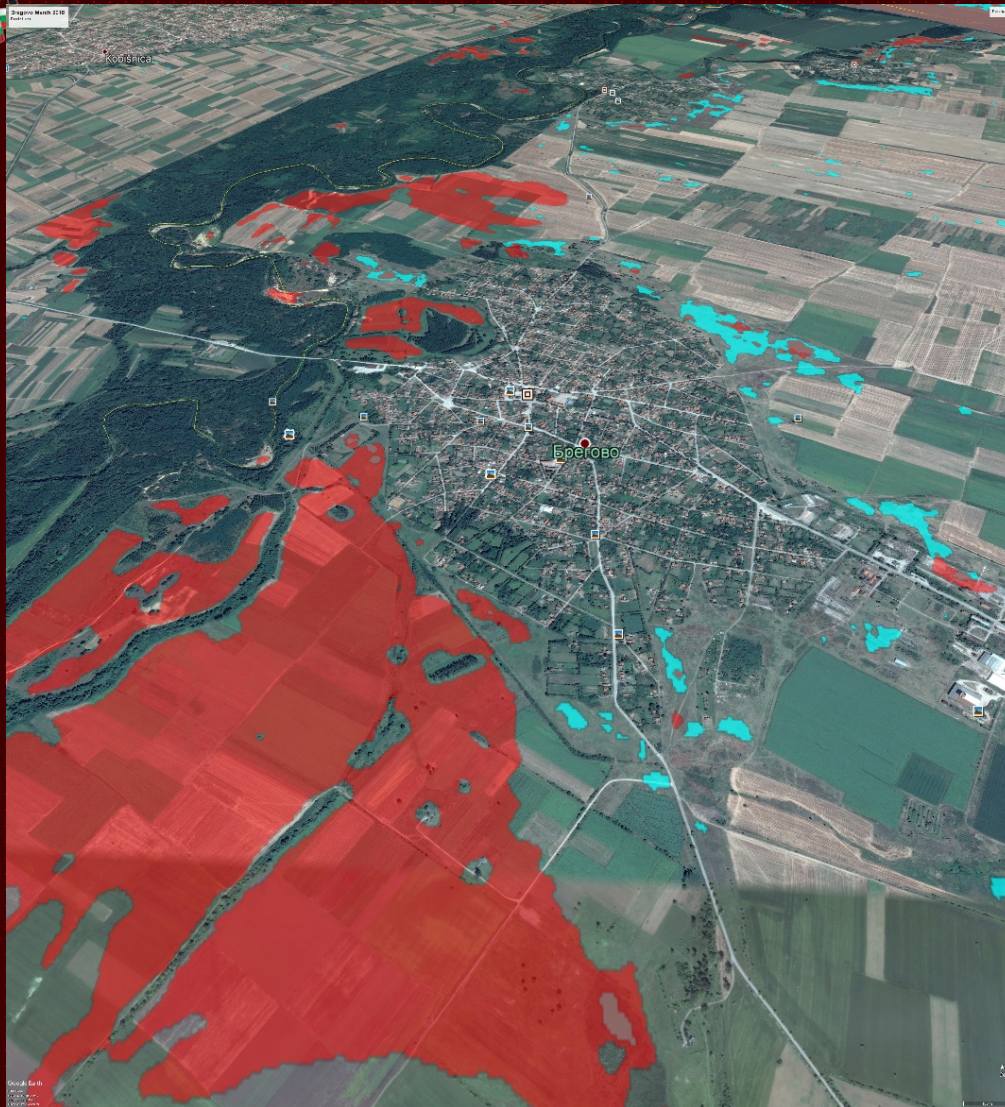


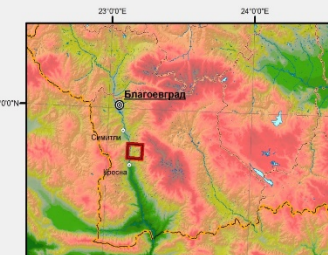
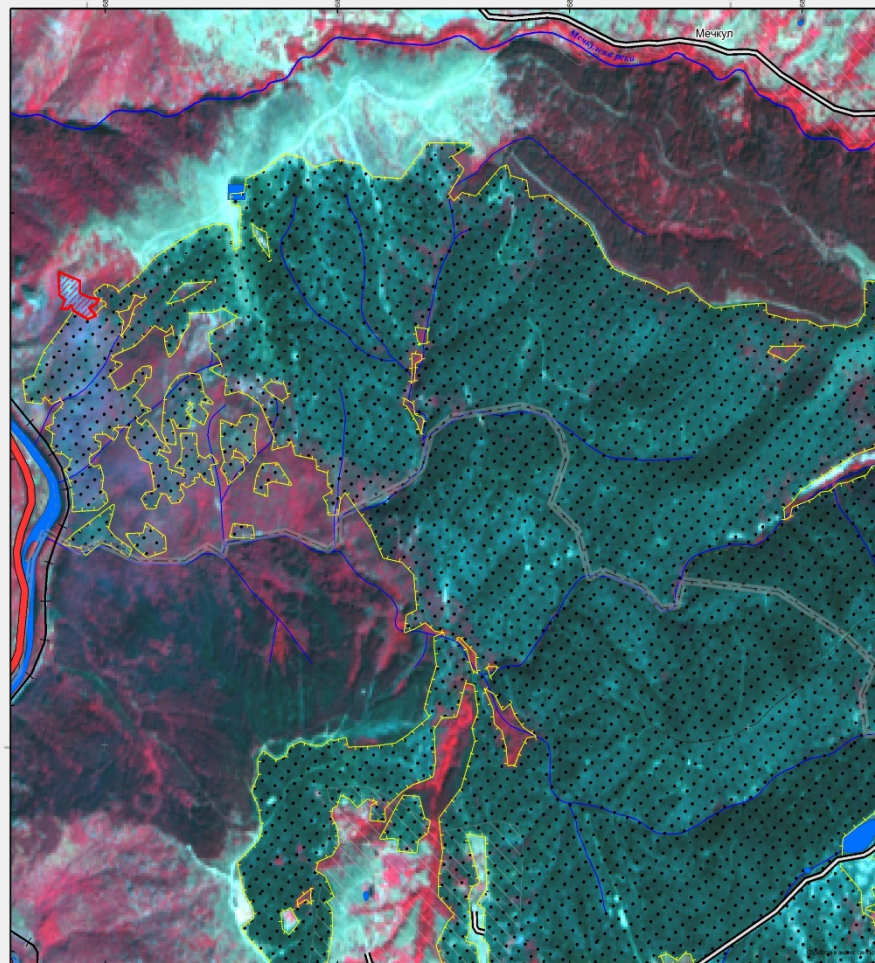


GIS Analysis products for Civil Protection Authorities

GE Blue -28 Feb , Red -12 March

GIS Calculations on CORINE





НАСЕЛЕНИ МЕСТА

- столетна
- млава
- общински център

ПОКОИ

- активно население
- основно население
- ЦДН на ДТ/ЗДН

АДМИНИСТРАТИВНИ ГРАНИЦИ

- общинска граница
- областна граница
- общинска граница на водоема
- общинска граница
- муниципалитетна граница
- първо ниво
- второ ниво
- трето ниво
- четвърто ниво
- петто ниво
- шест ниво

РЕГЕН ХИЛОМЕТРИ

0	100	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	2500	2600	2700	2800	2900	3000																													
0-50	50-100	100-150	150-200	200-250	250-300	300-350	350-400	400-450	450-500	500-550	550-600	600-650	650-700	700-750	750-800	800-850	850-900	900-950	950-1000	1000-1050	1050-1100	1100-1150	1150-1200	1200-1250	1250-1300	1300-1350	1350-1400	1400-1450	1450-1500	1500-1550	1550-1600	1600-1650	1650-1700	1700-1750	1750-1800	1800-1850	1850-1900	1900-1950	1950-2000	2000-2050	2050-2100	2100-2150	2150-2200	2200-2250	2250-2300	2300-2350	2350-2400	2400-2450	2450-2500	2500-2550	2550-2600	2600-2650	2650-2700	2700-2750	2750-2800	2800-2850	2850-2900	2900-2950	2950-3000

Опожарени площи според класификацията на земното покритие CORINE 2012 в хектари (ха)

	Широколистні пори	64,0 ха
	Узлісткові пори	622,4 ха
	Примієв зона-лениці пори і присти	204,6 ха
	Естествени ливади	548,3 ха
	Палаци	46,5 ха
	Некласифікована територія	31,1 ха
	Оброблювані землі з сільськогосподарською частинною рослинністю	161,0 ха
	Розсіпані парцели з насадженнями (градини)	37,8 ха
Обща площ:		1715,7 ха

Равнинни правоъгълни координати Геодезически координати

Картнографска проекция: UTM Zone 34N Пространствено обозначение: Geographic (DMS)

Геодезическа референтна система: WGS 84 Геодезическа референтна система: WGS 84

0 0,4 0,8 1,6 2,4 3,2

Сателитно изображение Sentinel-2a от 12:28 ч. (UTM+3) на 27.08.2017 г. с пространствени резолюции 10м, канали 8,4 и 3. Източници на данни: CSCDA Програма "Коперник" (<https://space.cscda.copernicus.org/>)

Създаването на тази карта е извършено в Центъра за аерокосмически изследвания ДКИС-MBP при подпомагане на програмните продукти ArcGIS 9.3

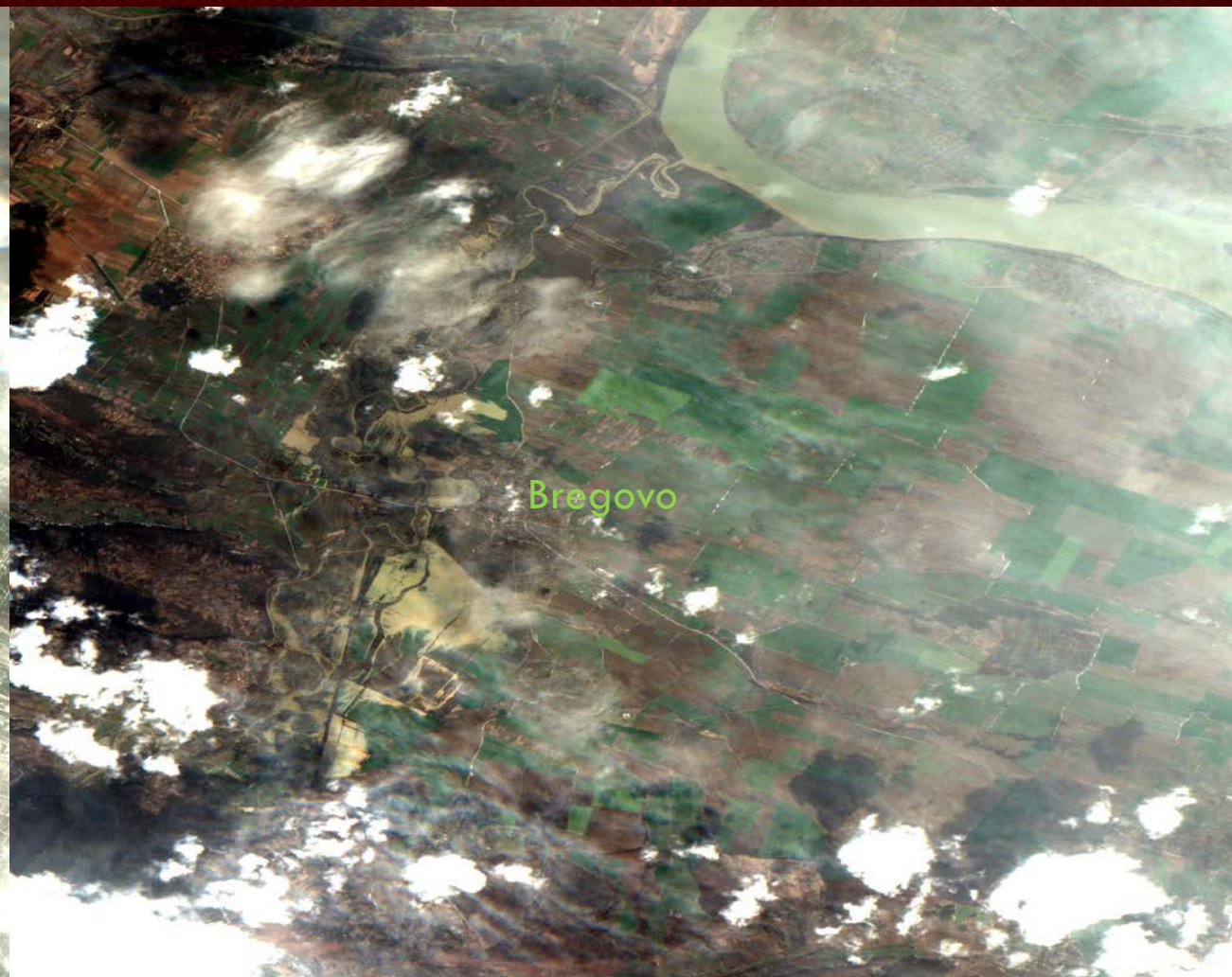
София 29.08.2017 г., ЦАН Ref. No. TA-170827-122



Sentinel 2 Ch. 4,3,2 – Bregovo Region, Flood on March 11th

Ref. Date - March 10th

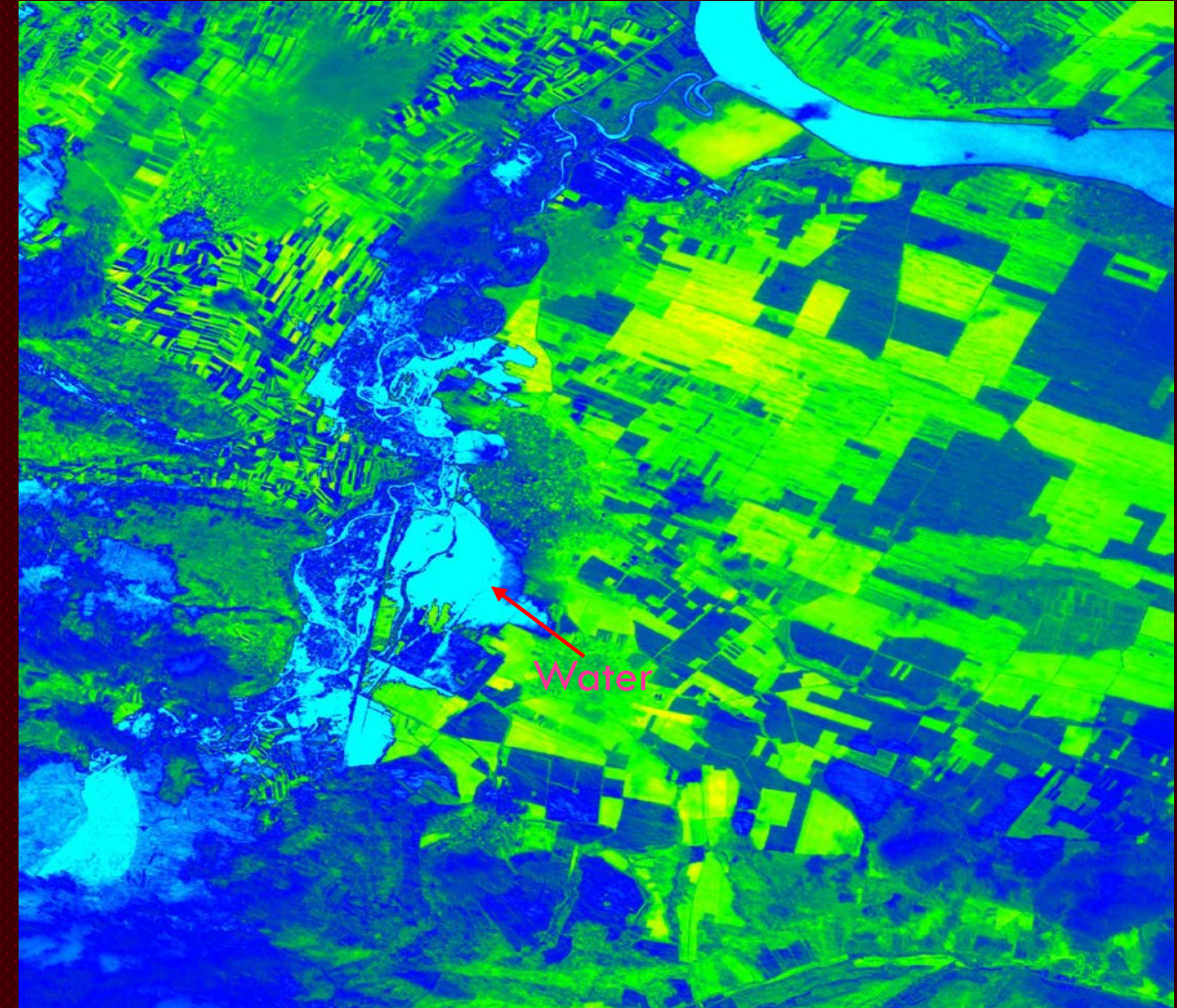
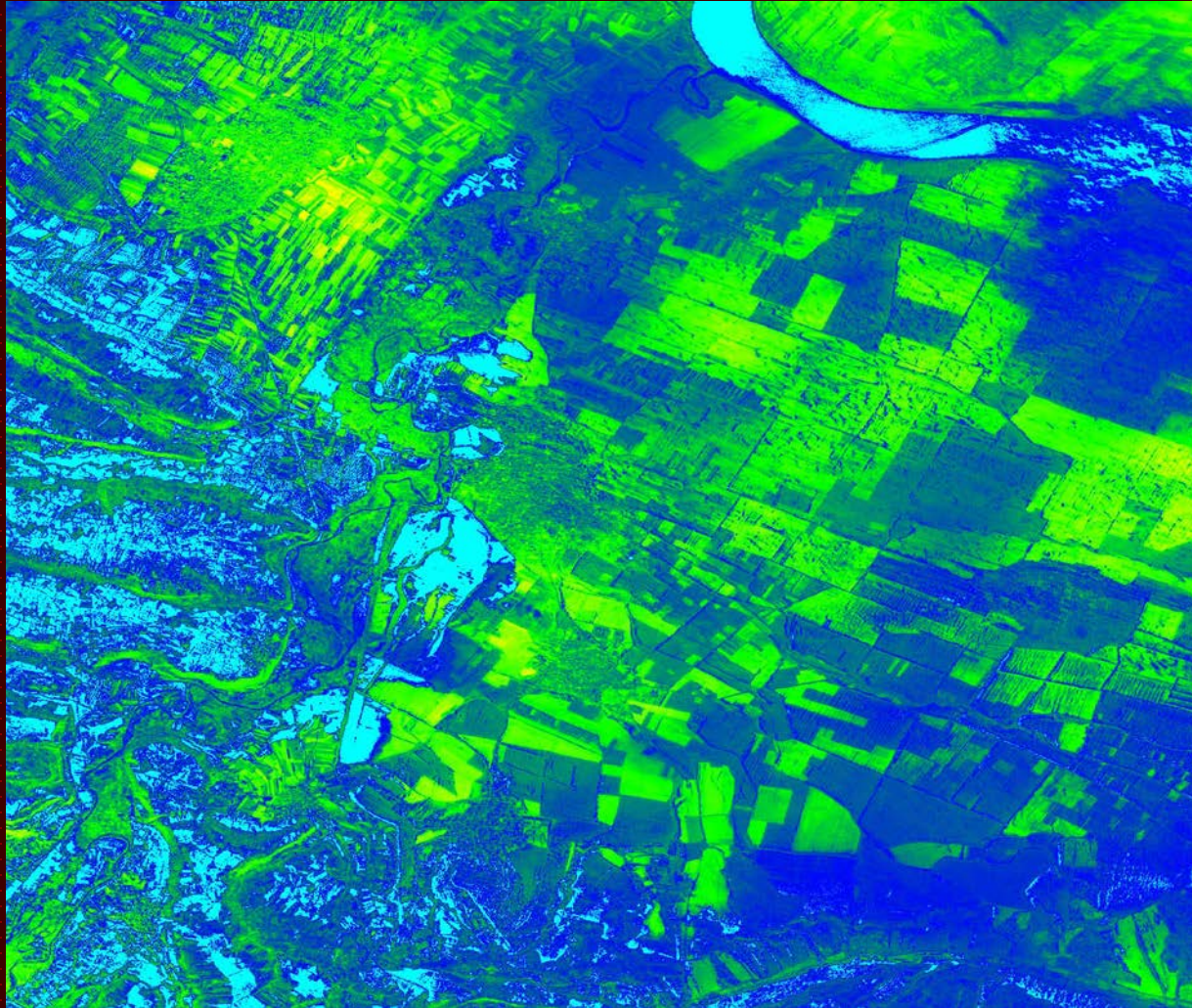
Date after – March 13th





Sentinel 2, NDWI – Bregovo Region, Flood on March 11th

Ref. Date - March 10th -0.5 0 +0.5 Date after – March 13th





Sentinel 1 - Deeper Classification

Sentinel 2, March 13th , CH432

Sentinel 1, March 12th ,RGB

5 Classes

Sowings

Forest

Plowed land

Water

Urbanization



Conclusion and Future

Free Copernicus services cause rapid development

Ocean of data

- Automation of procedures up to alerts
- Idea for a centralized BG hub with preprocessed data.
- Improved interaction between BG EMS authorities



Thank you!

Questions?

