



# Rapid Multi-Sensor System for Effective Risk Analyses

13 November 2007

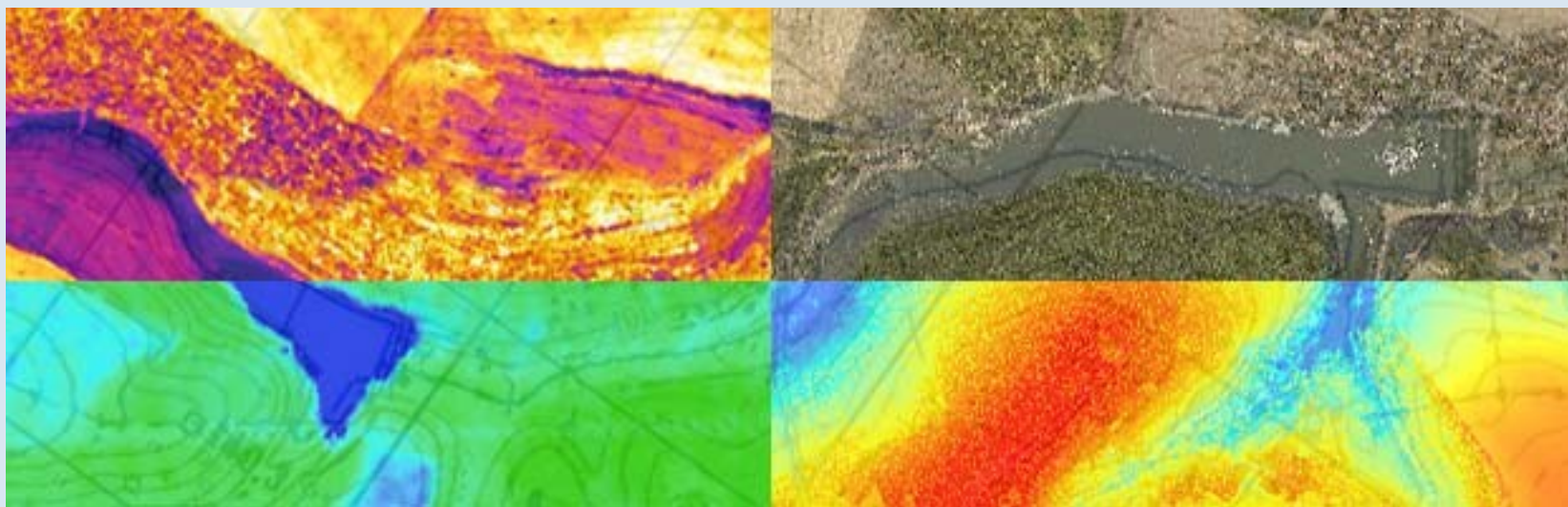
Conference on Geomatics in support of the Common Agriculture Policy  
Madrid, Spain





## Main two applications of the Common Agriculture Policy covered by this approach:

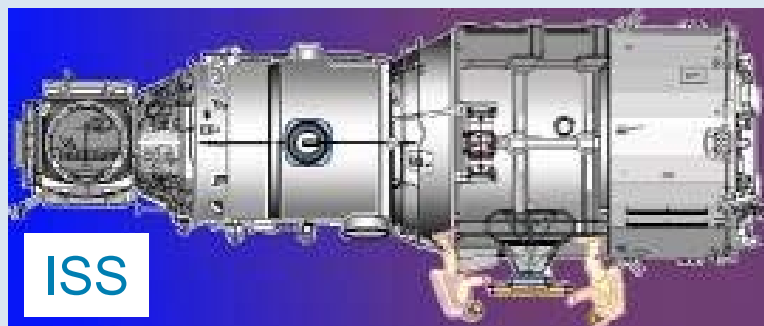
1. Control of the Good Agriculture Environment Conditions (GAEC), and
2. Update of the Land Parcel Identification System (LPIS)





## About Miramap

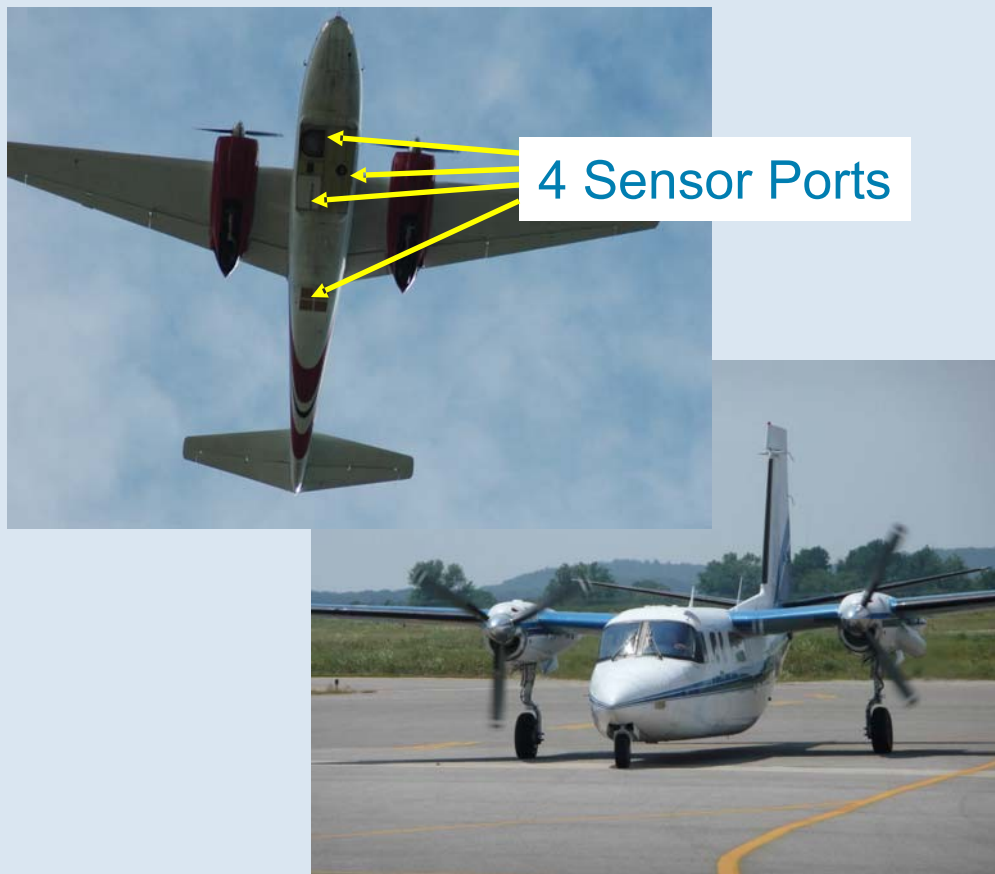
- ③2004: Dutch company created at European Space Agency (ESA) in the Netherlands
- ③2005: Nominated as most innovative venture of the year
- ③Since then, our customers are:
  - ③National Department of Water Management
  - ③Regional Water Boards
  - ③Mapping Agencies
  - ③Civil Engineering Companies





## Multi-Sensor from Aircraft and RUAS

Aircraft for Regional and National Data



RUAS for Local Data

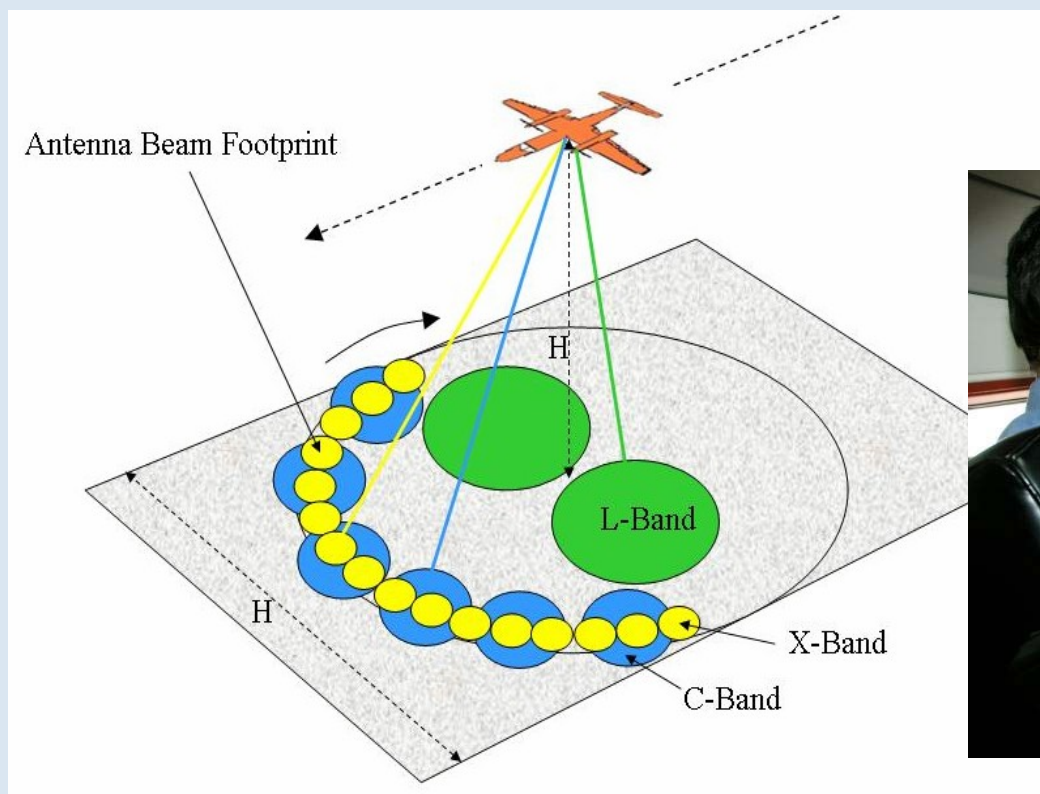


Fully Autonomous





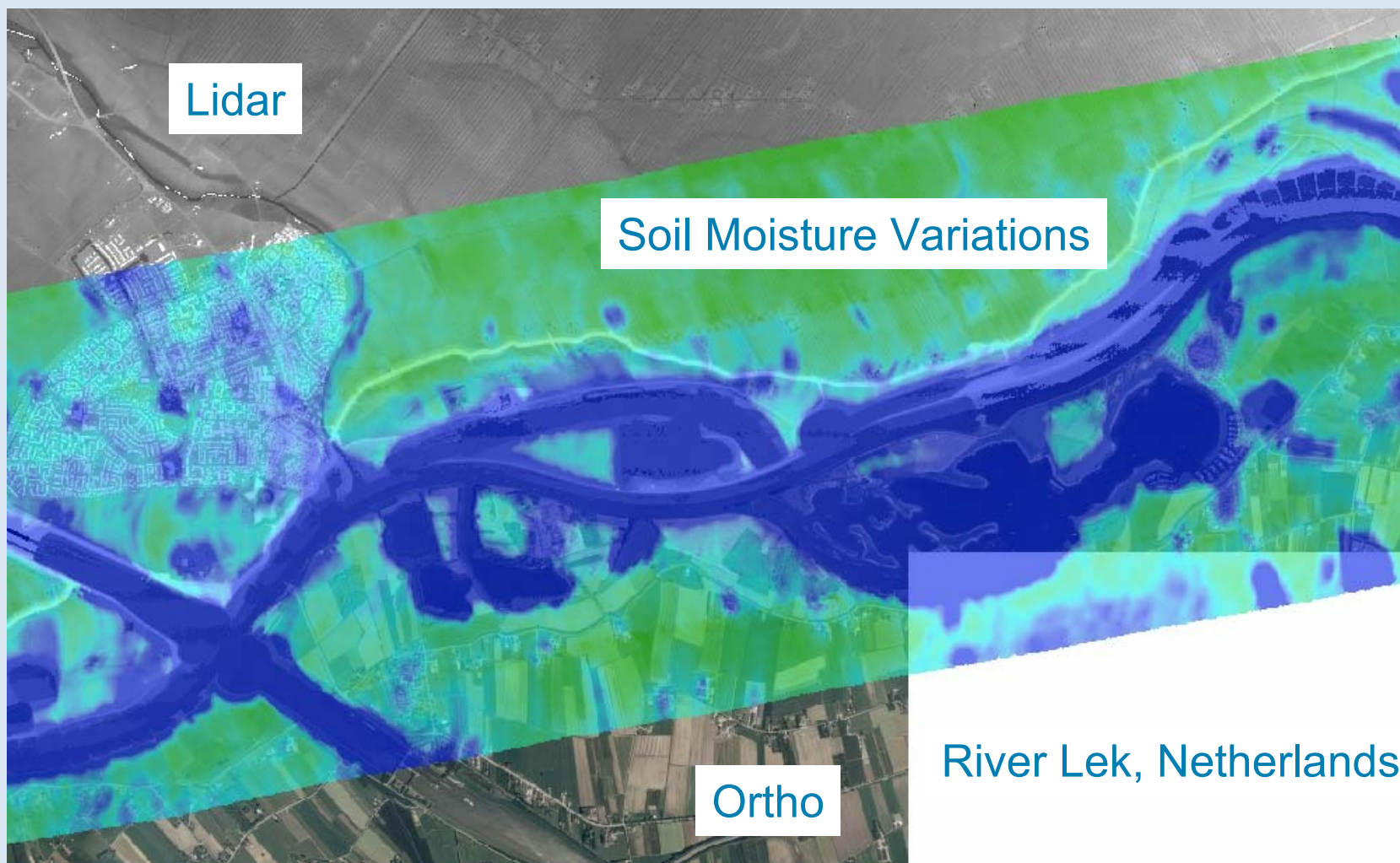
## Microwave Radiometer Scanner for GAEC Control





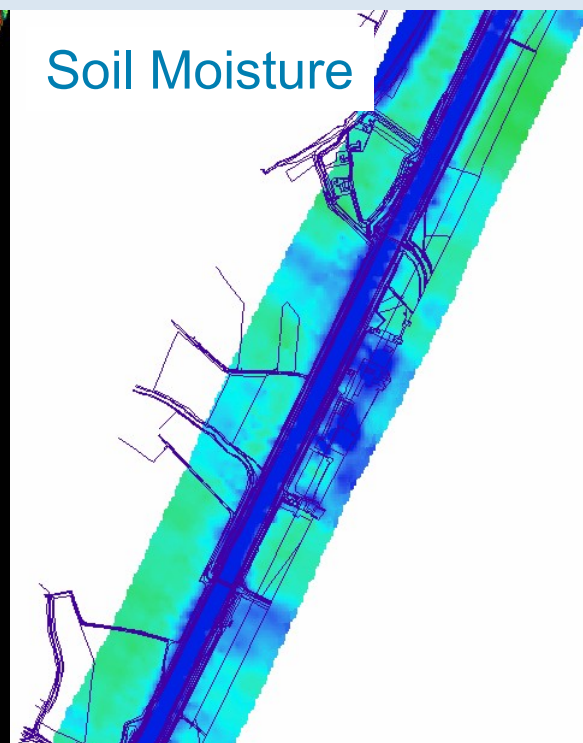
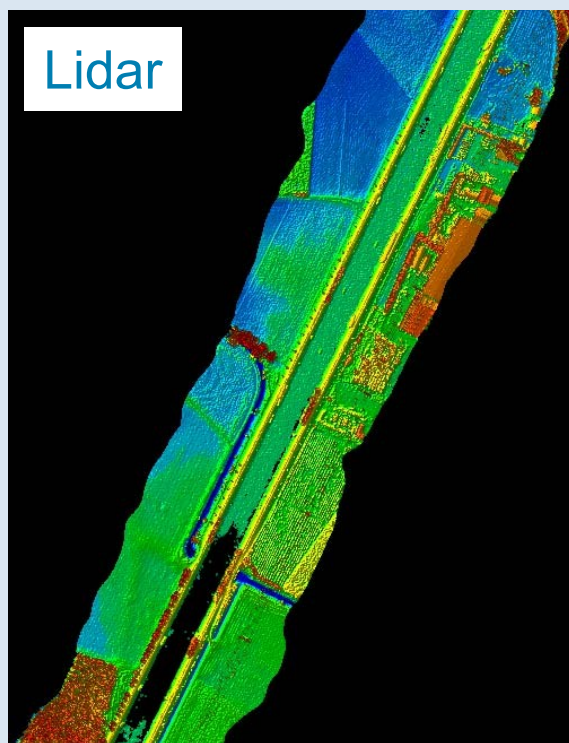


## Experience in Water Seepage Detection





## Experience in Water Seepage Detection



Juliana Canal, Netherlands





## Show Case Project: Bulgaria 2007

③Data was collected over different areas with:

- ③Scanning Microwave Radiometer System Radius (0.15-deg BT)
- ③Thermal Infrared Camera (0.1-deg temperature)
- ③Lidar Scanner (10-cm vertical accuracy)
- ③Digital Color Camera (0.1-m true orthophoto)

③During the experiment weather changed rapidly from dry to very wet condition, so that unique information was received related to:

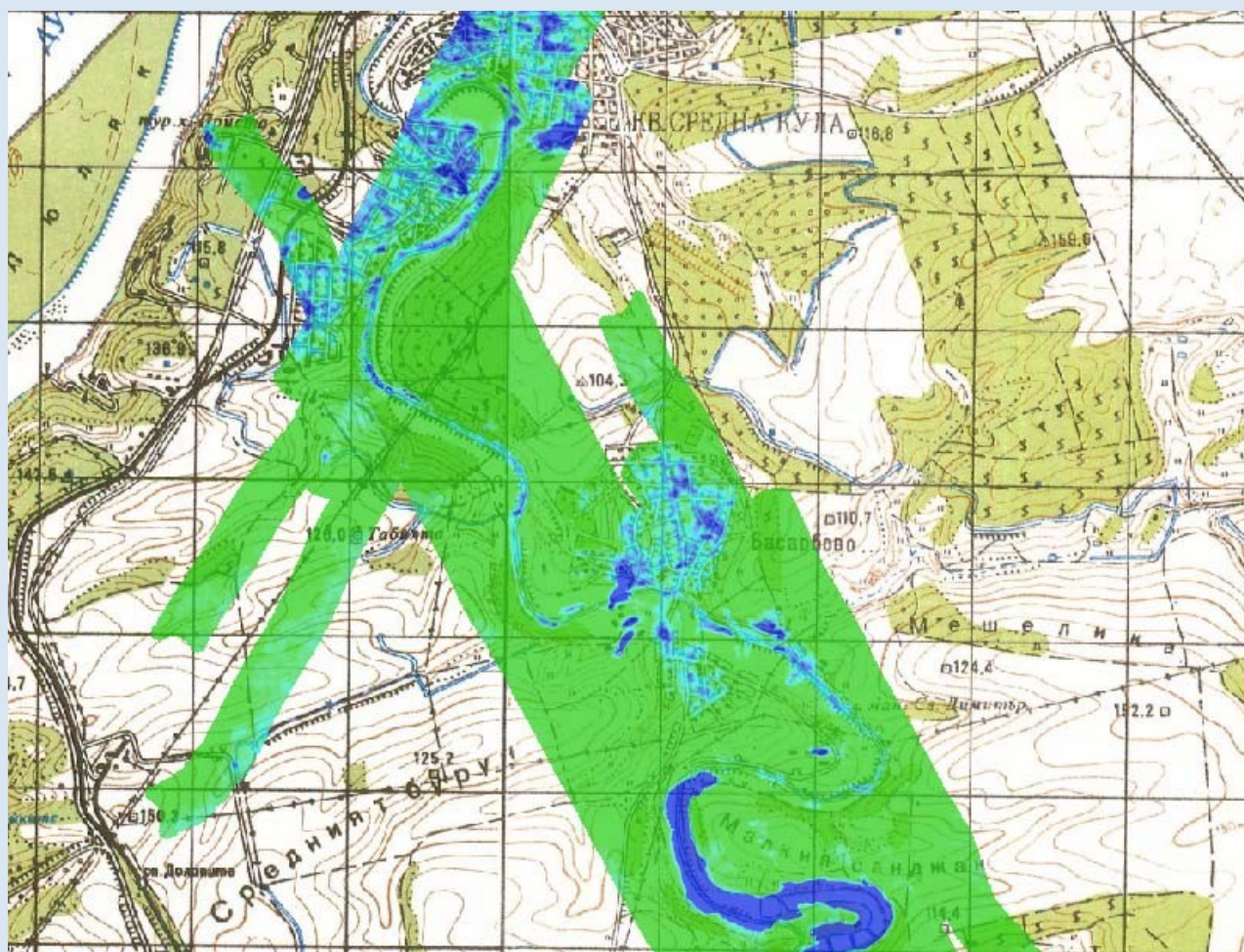
- ③surface soil moisture (dry conditions 0.05 – 0.10 g/cc; saturation up to 0.35 g/cc)
- ③underground moistening reached 0.35 g/cc in the condition of saturation
- ③revealing over-moistened zones near water barriers
- ③land surface cover and relief features of terrain impacting moisture parameters.







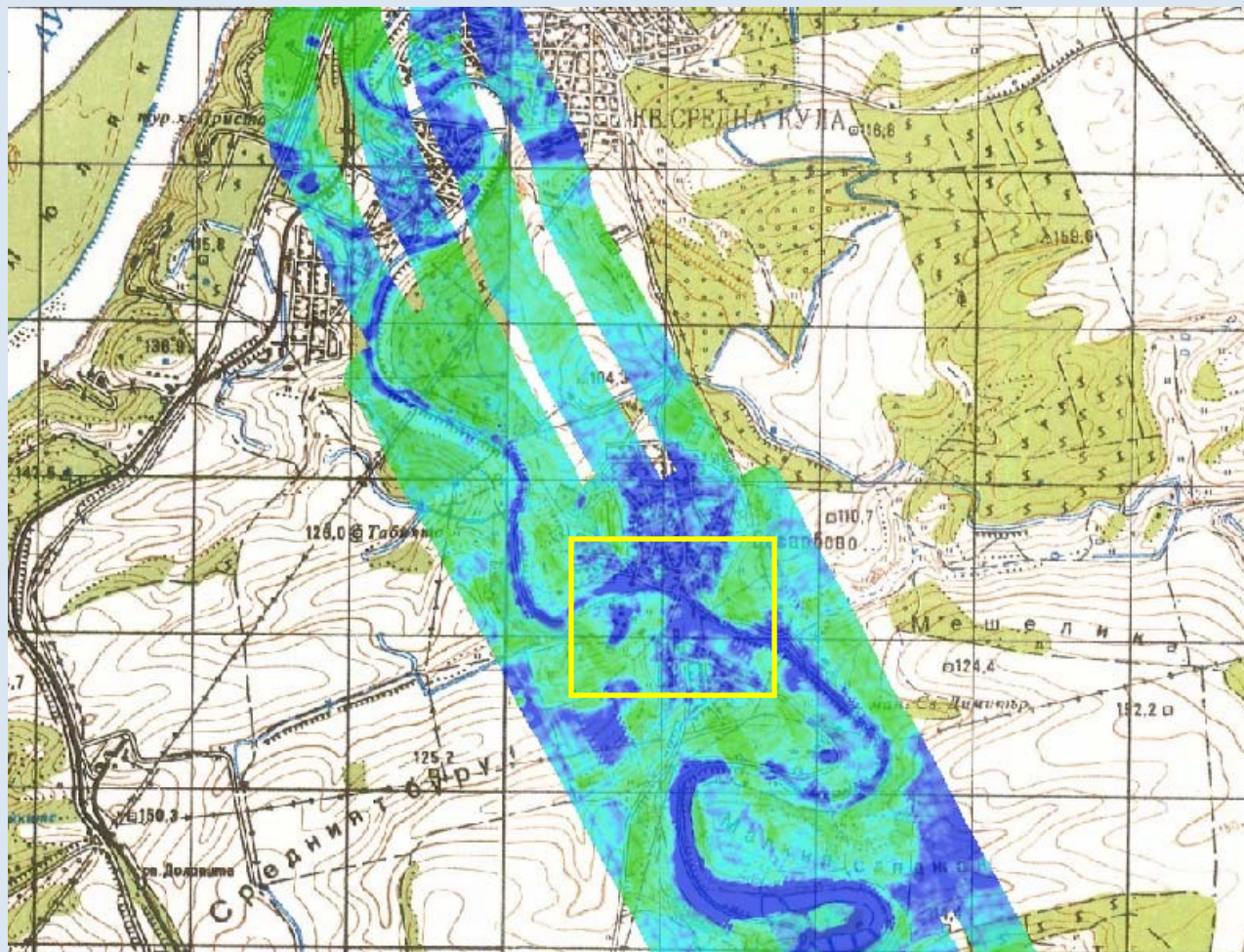
## Rusenski Lom River – Microwave Surface Moisture Related Data, July 31, Dry Condition







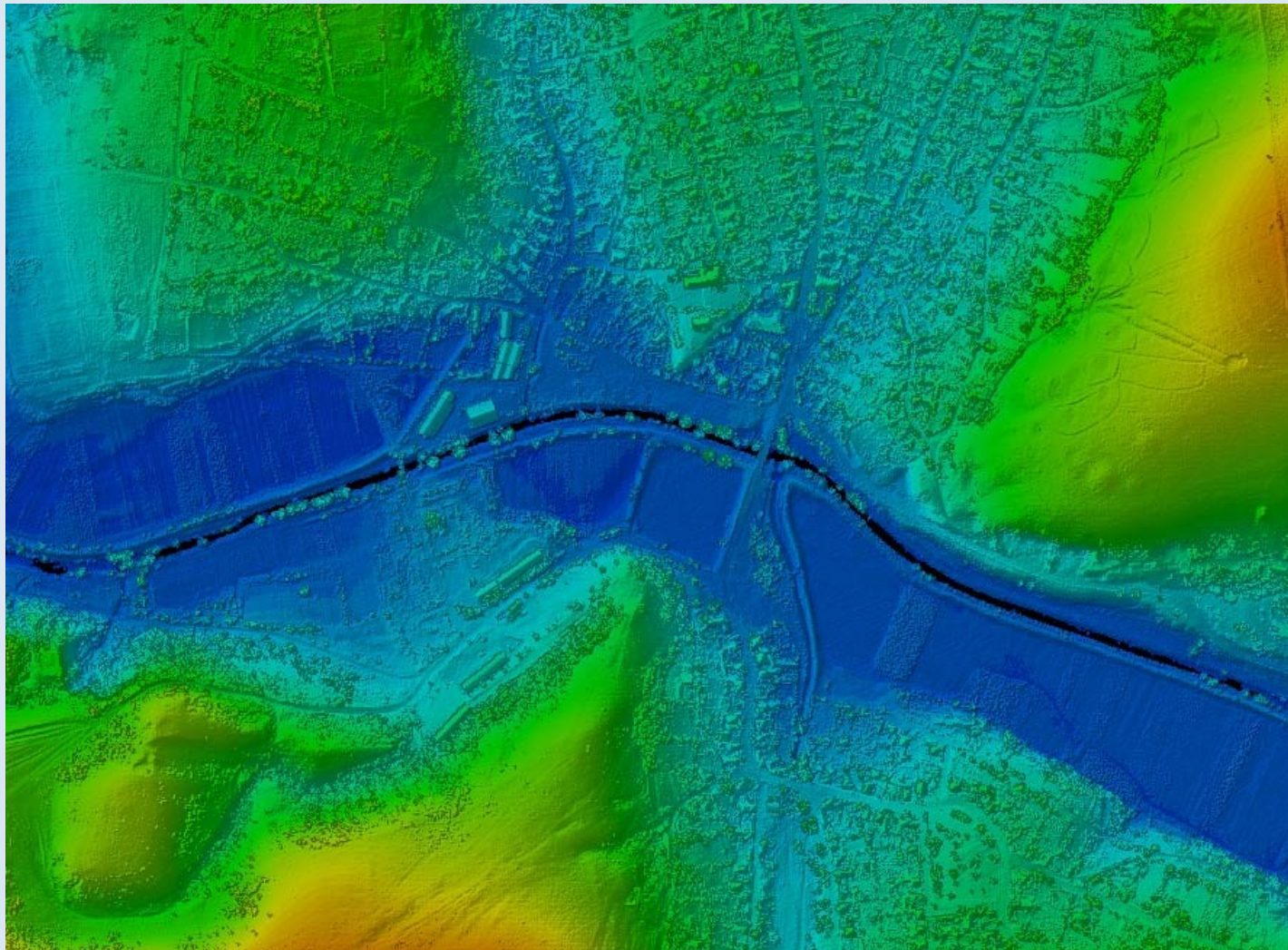
## Rusenski Lom River – Microwave Surface Moisture Related Data, August 2, Wet Condition







## Rusenski Lom River – Lidar Elevation

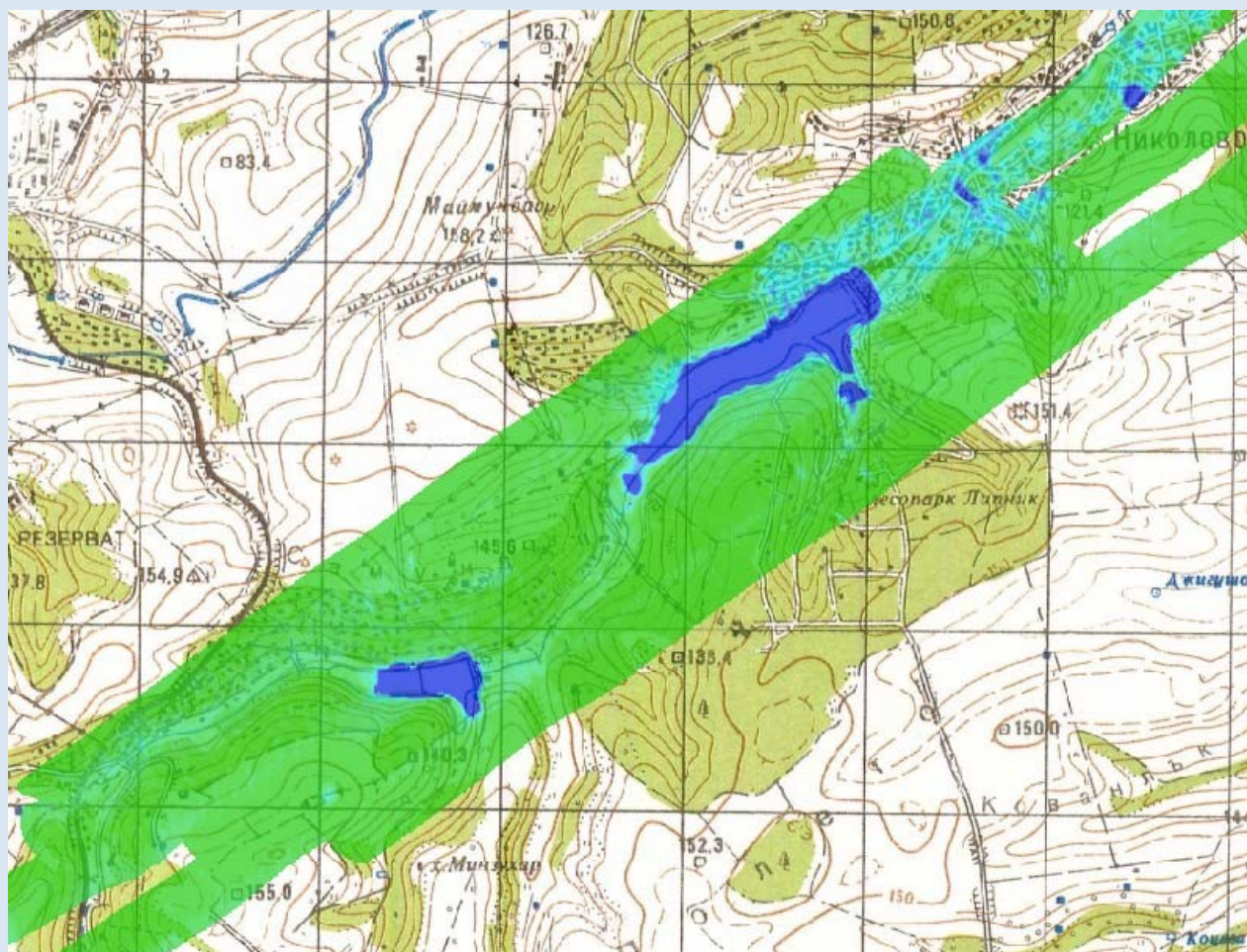


map





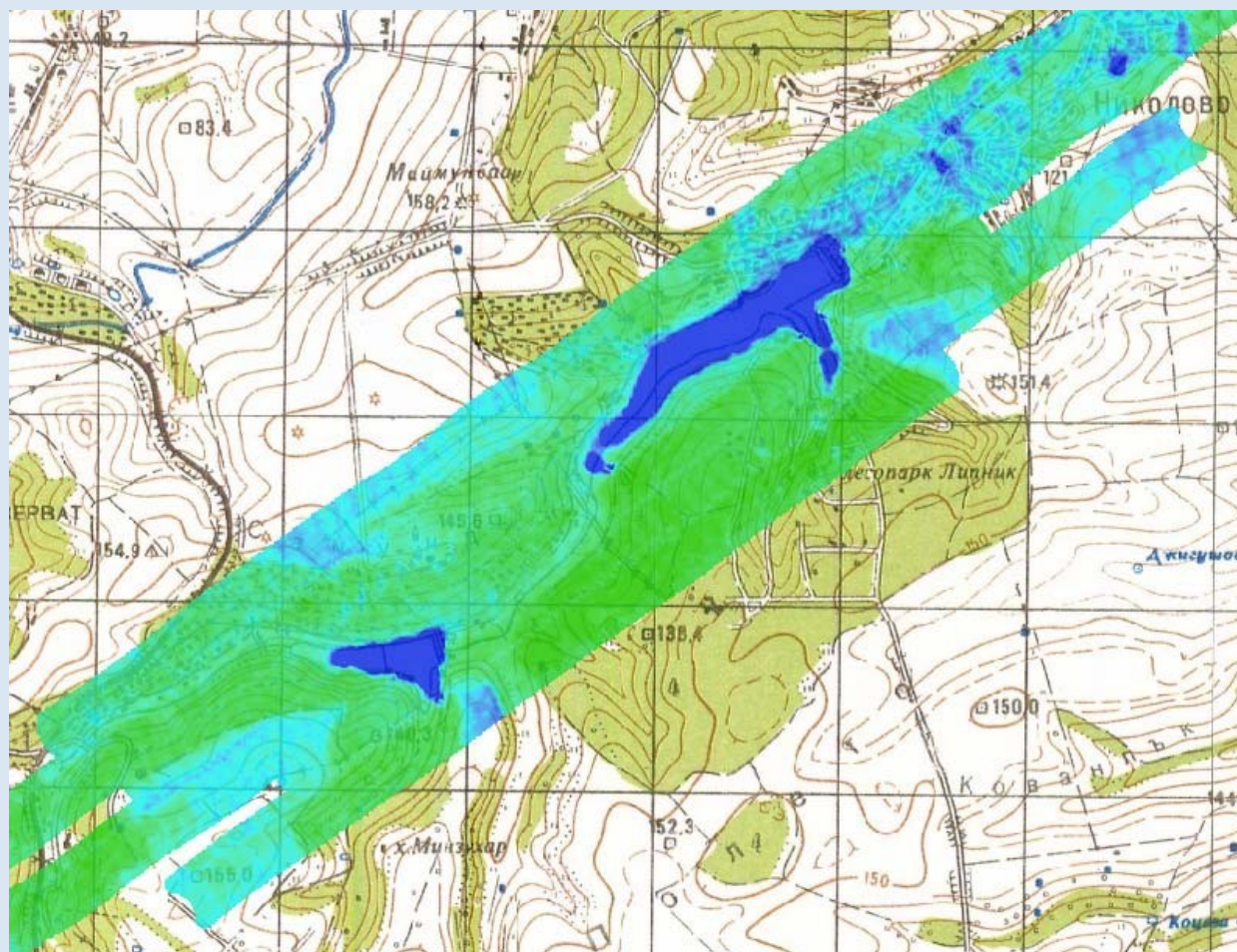
## Dams at Nikolovo – Microwave Surface Moisture Related Data, July 31, Dry Condition





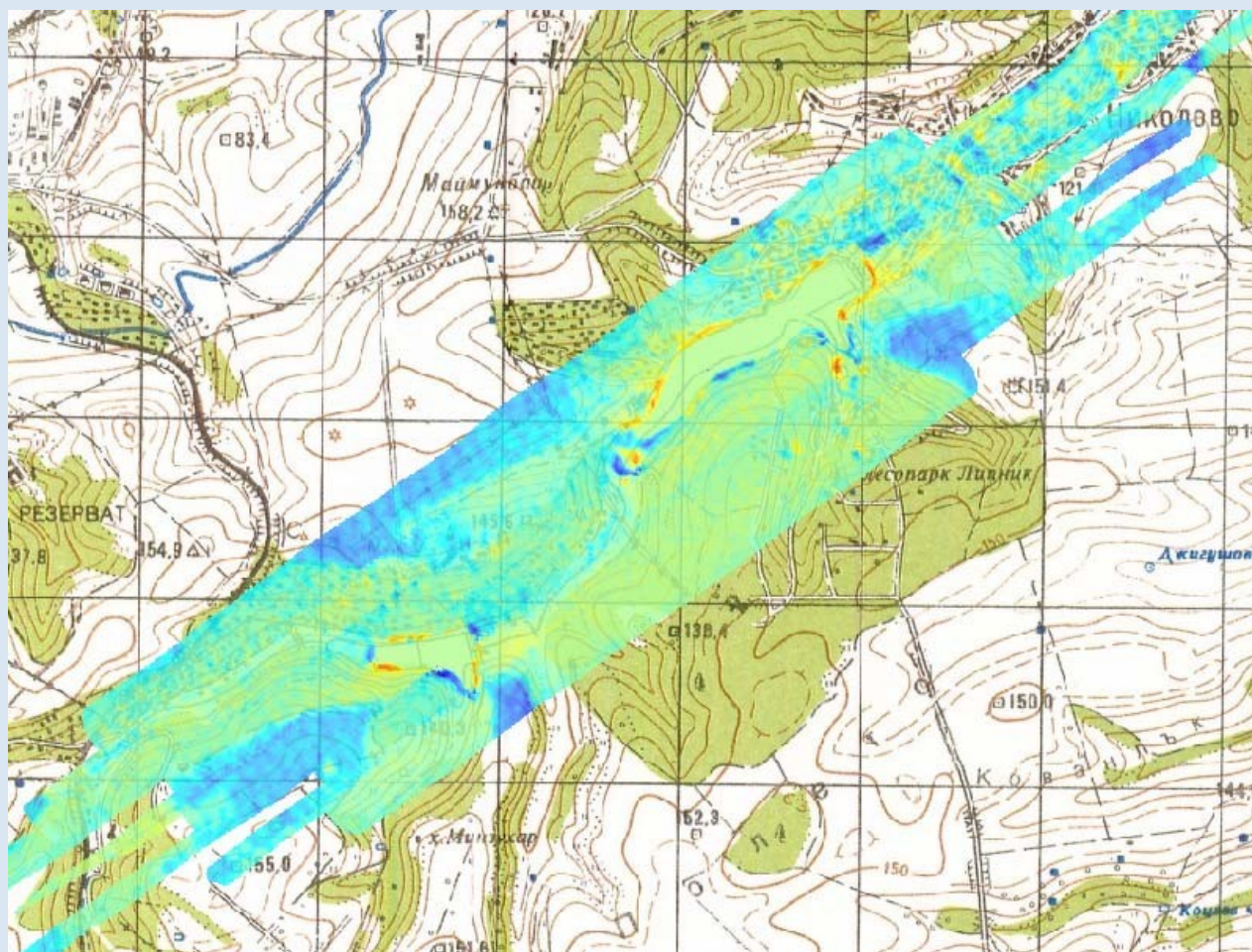


## Dams at Nikolovo – Microwave Surface Moisture Related Data, August 2, Wet Condition





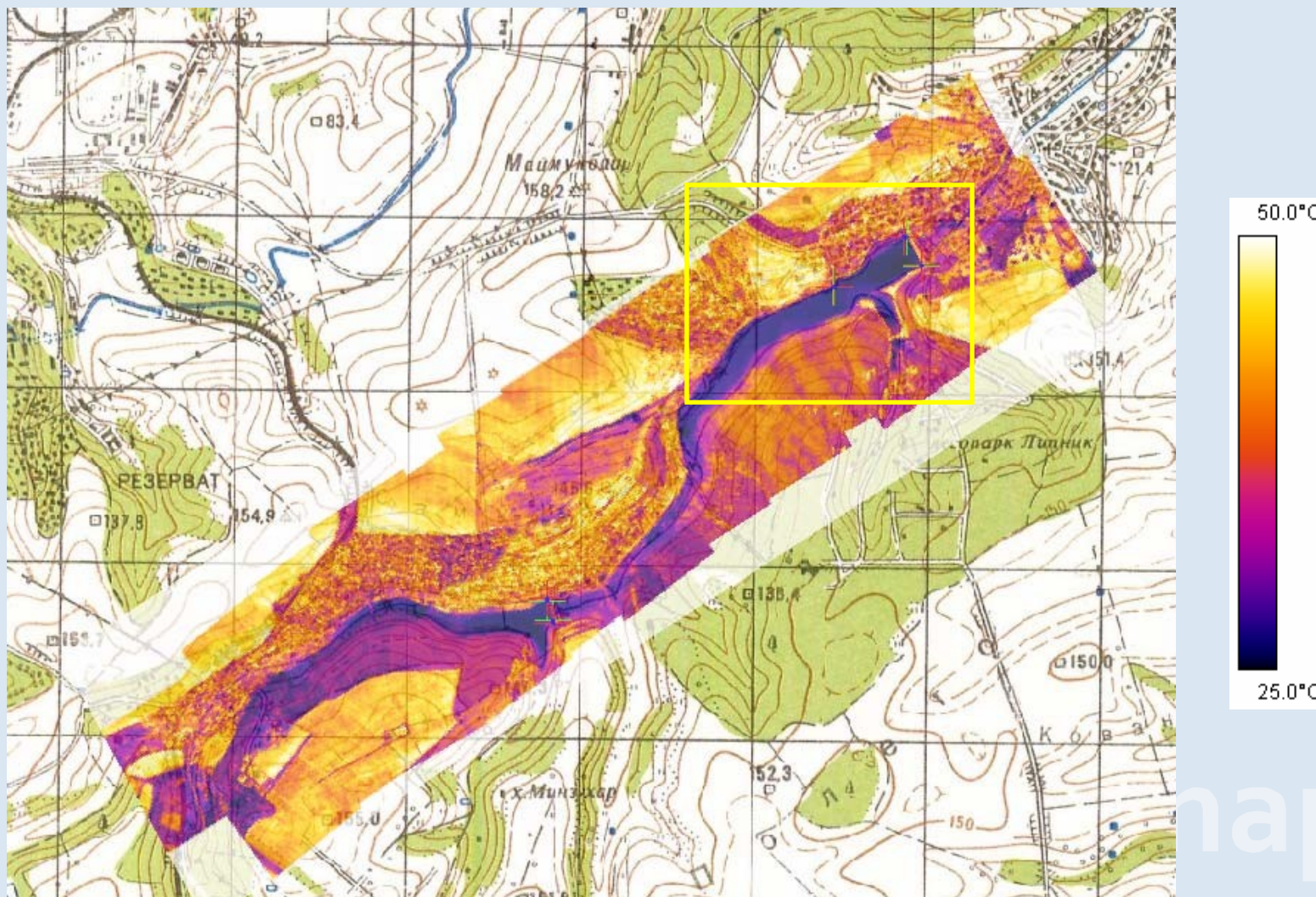
## Dams at Nikolovo – Microwave Surface Moisture Related Data, Changes Dry-Wet







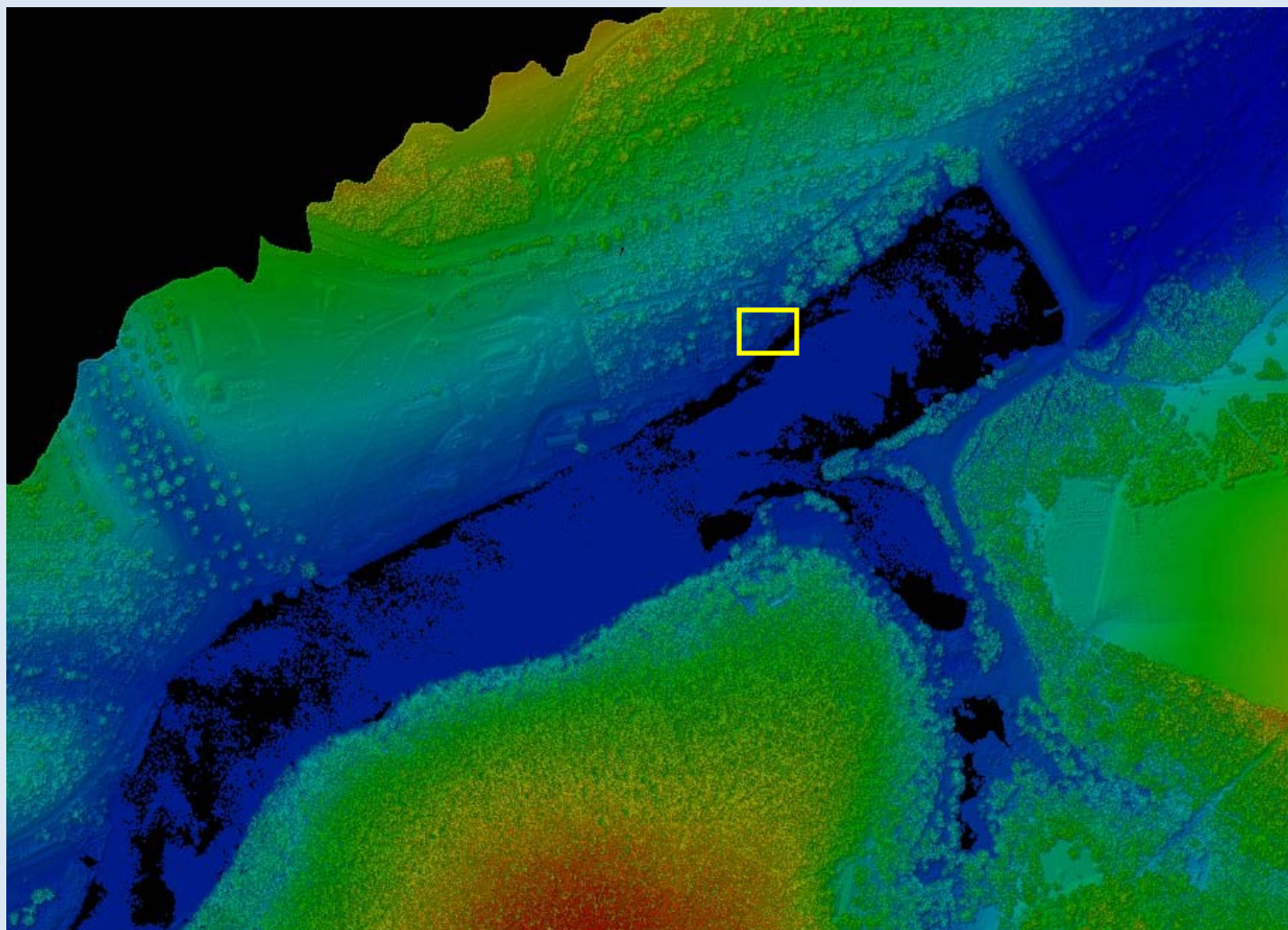
## Dams at Nikolovo – Thermography Data







## Dams at Nikolovo – Lidar Elevation



ap





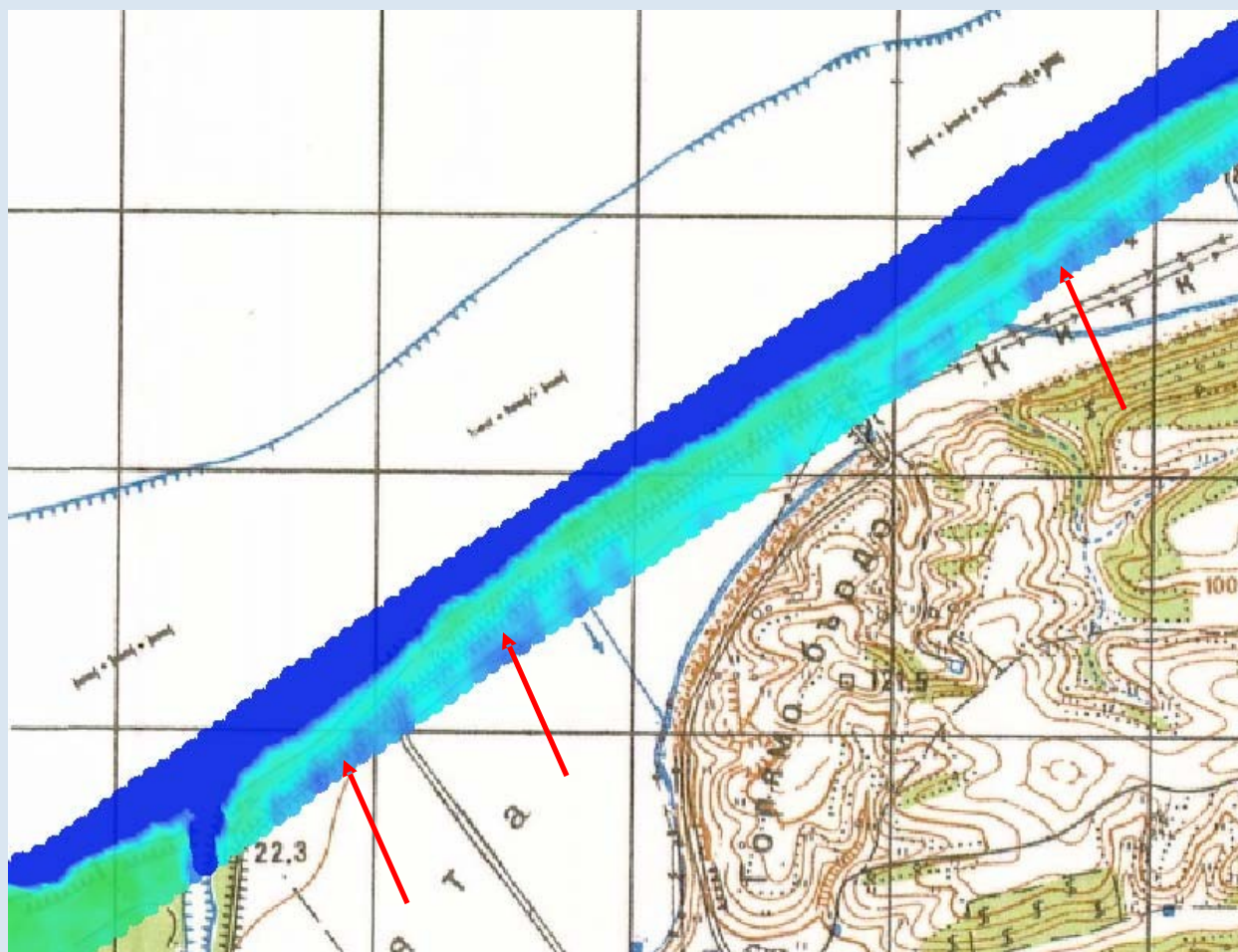
## Dams at Nikolovo – True Ortho Photo (for LPIS)



map

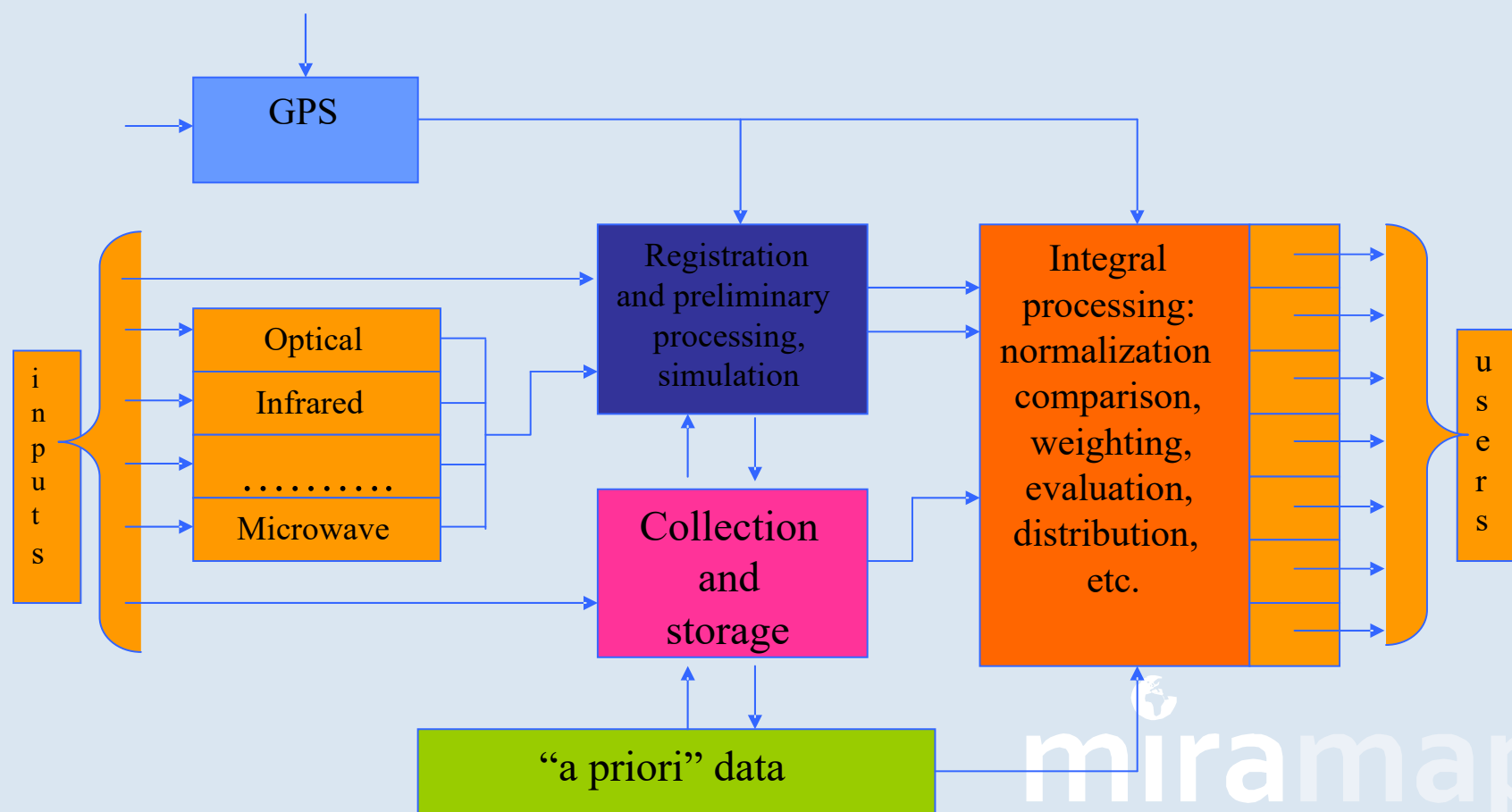


## Danube River – Microwave Surface Moisture Related Data, August 2, Wet Condition





## Information Monitoring System for Effective Risk Analyses





## Conclusion and Recommendation

The rapid multi-sensor system is an effective, flexible, accurate, cost-efficient, comparable, safe, and valuable addition for simultaneous:

- ③ Control of the Good Agriculture Environment Conditions (GAEC), especially standards (after Livio Rossi and Paolo Tosi)
  - ③ 1.1 Temporary channeling of surface water on sloping terrain, and
  - ③ 3.1 Defense of ground structure through maintenance of surface water drainage
- ③ Update of the Land Parcel Identification System (LPIS)







Thank you for your attention!

