

# Joint Workshop of the GOFC-GOLD SCERIN and MedRIN Networks

CIHEAM conference center, Chania, Greece, July 16 – July 19, 2024

Land Cover Change (LCC) and Extreme Events in the Context of Climate Change

Mediterranean Agronomic Institute of Chania

Region of Crete

Eratosthenes Center of Excellence, Cyprus University of Technology

Aristotle University of Thessaloniki

NASA LCLUC Program

GOFC-GOLD and START, USA



# Application of GeoAI in water monitoring

Gordana Jakovljević, University of Banja Luka



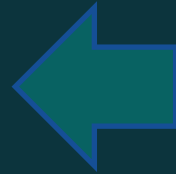
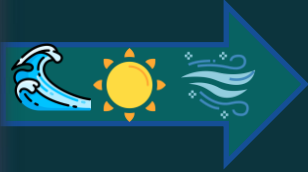
# SDGs



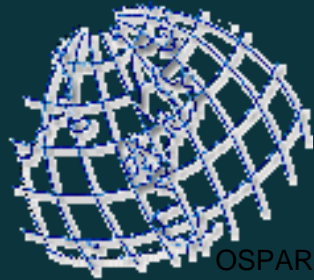
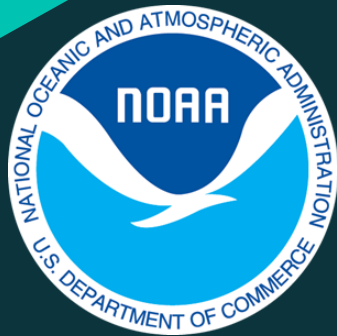
*“... reaching goal 6 is **alarmingly** off track”*

## SDG 6 Global Acceleration Framework





2,5 x 2,5 cm



United Nations  
Educational, Scientific and  
Cultural Organization



Intergovernmental  
Oceanographic  
Commission

1 x 1 cm



# Challenges

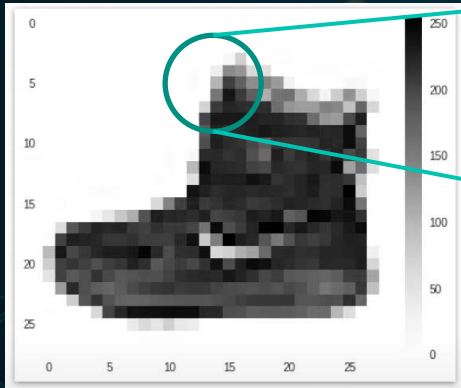
Data collection?

Training data?

# AUTOMATION

of processing procedures

# Convolution



0	64	128
48	192	144
142	226	168

Filter 3 x 3

Current pixel value: 192

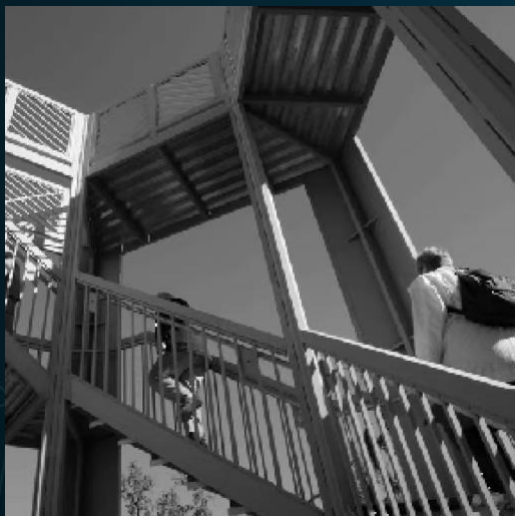
-1	0	-2
0.5	4.5	-1.5
1.5	2	-3

Filter

Current pixel value: 192

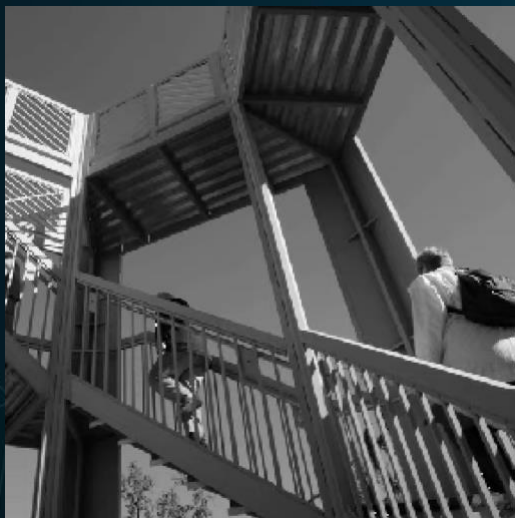
$$\begin{aligned} \text{New pixel value} = & (-1 * 0) + (0 * 64) + (-2 * 128) + \\ & + (0.5 * 48) + (4.5 * 192) + (-1.5 * 144) + \\ & + (1.5 * 142) + (2 * 226) + (-3 * 168) \end{aligned}$$



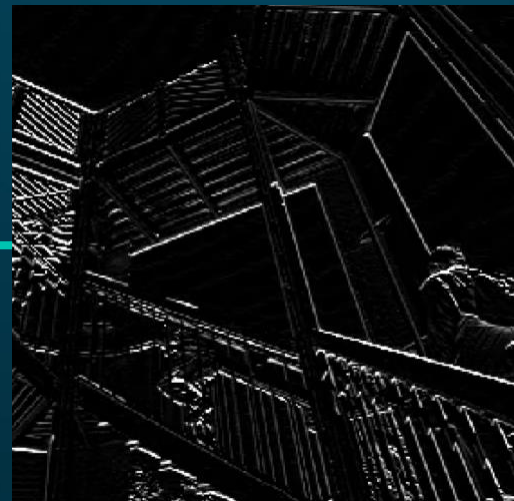


-1	0	1
-2	0	2
-1	0	1





-1	-2	-1
0	0	0
-1	2	1



# POOLING

0	64	128	128
48	192	144	144
142	226	168	0
255	0	0	64

0	64
48	192

142	226
255	0

128	128
144	144

168	0
0	64

192

255

144

168

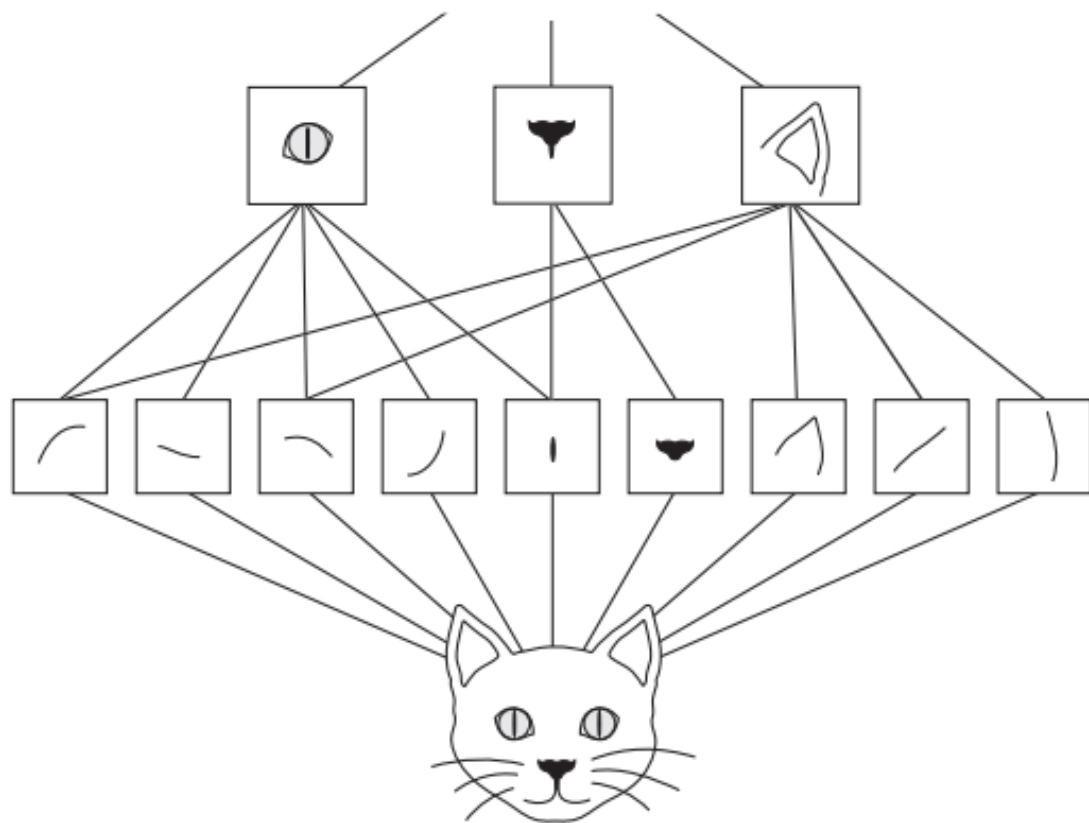
192	144
255	168



**MAX POOLING**  
**2 X 2**



“cat”



# GEO AI



Satellite images



Sensors



UAV



IaaS

PaaS

SaaS



**Water  
body  
geometry**

**01**

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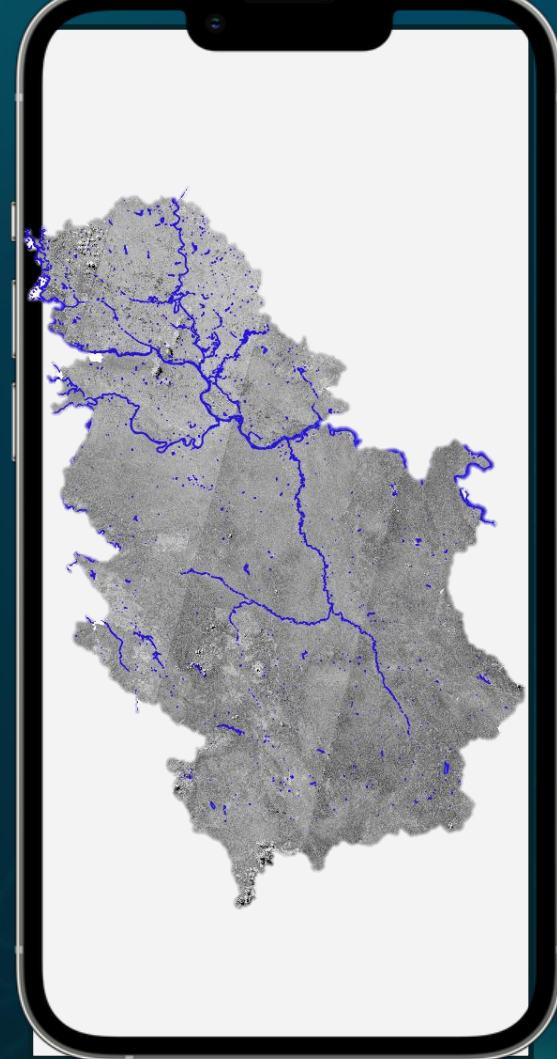


Sentinel 1 F1 :0.90

Sentinel 2 F1 :0.92

**INDICATOR 6.4.2.**

**INDICATOR 6.6.1.**

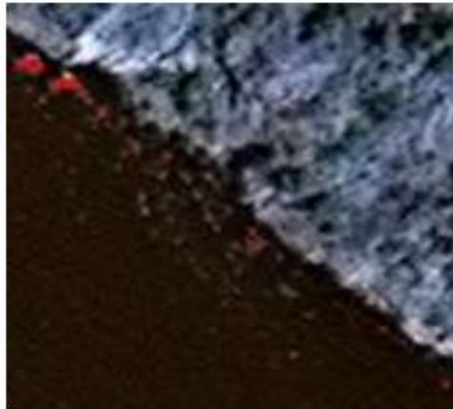
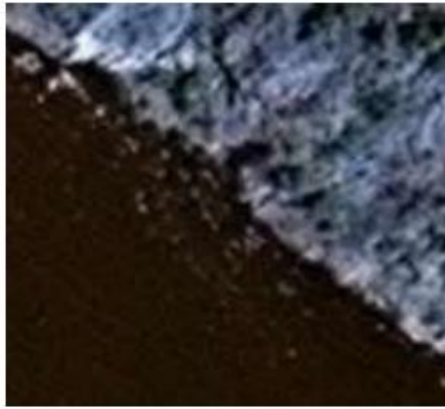
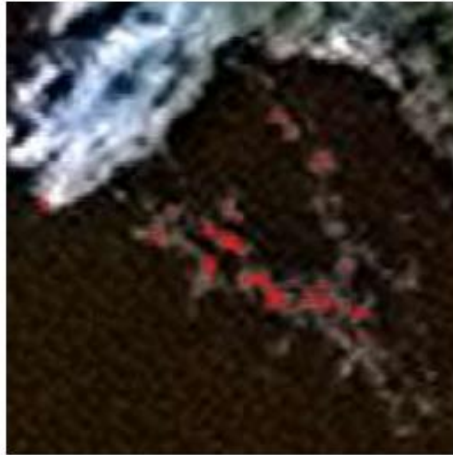




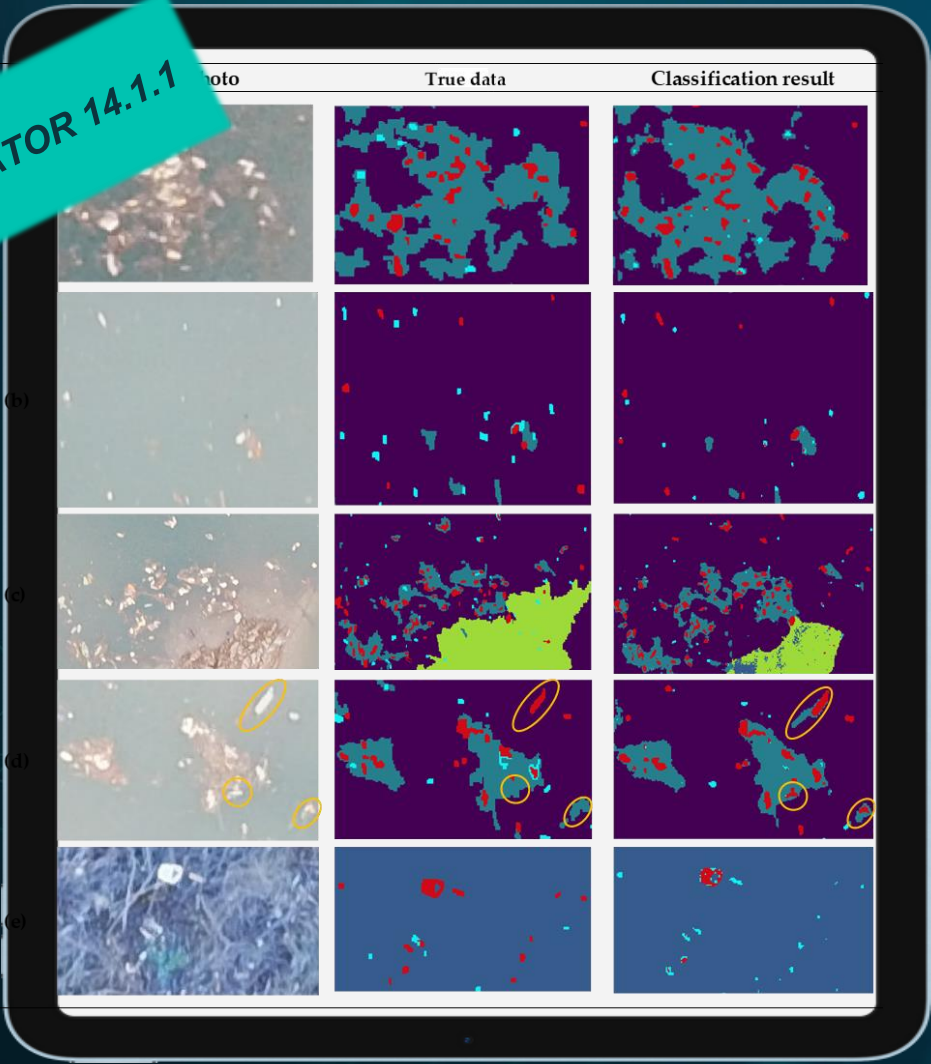
**Floating  
plastic  
density**

**02**

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INDICATOR 14.1.1



3%





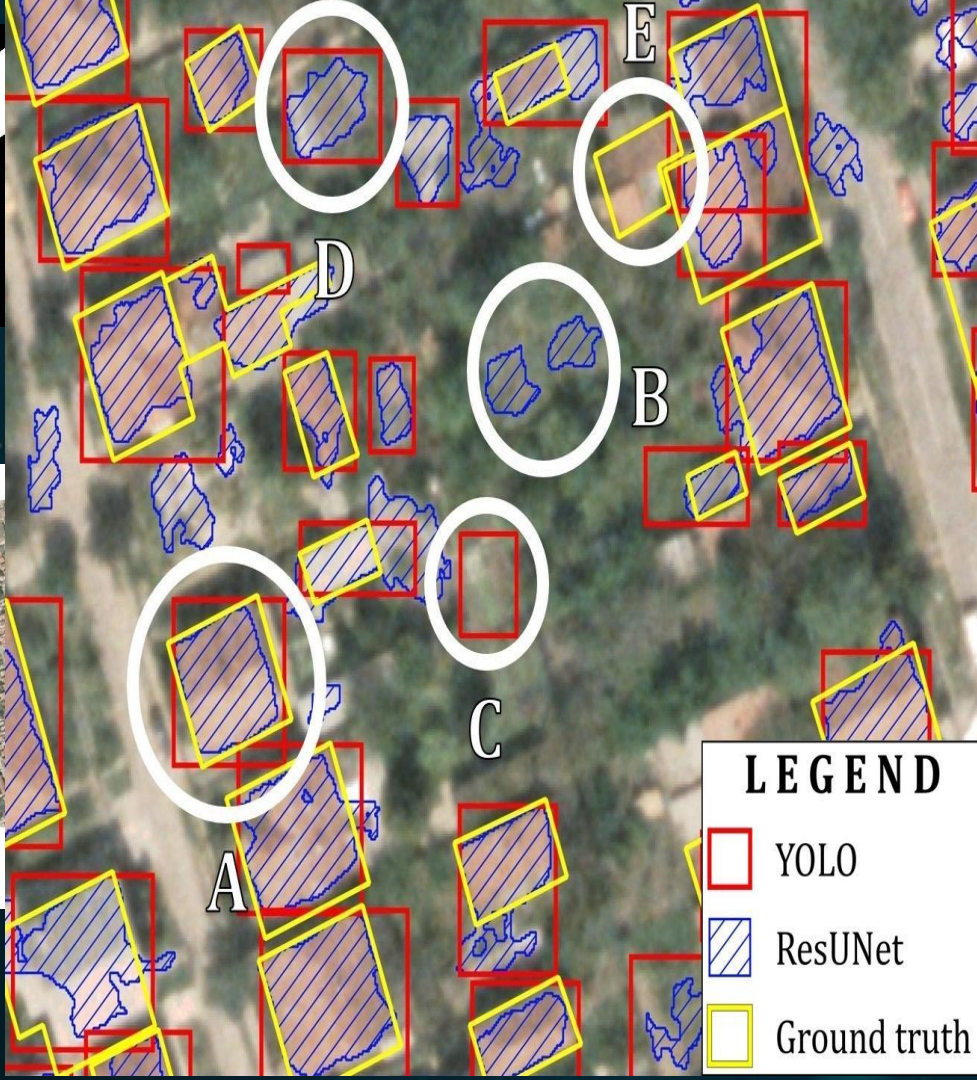
plastic  
wood



- bottle
- food containers
- food packaging
- other






# Building footprint



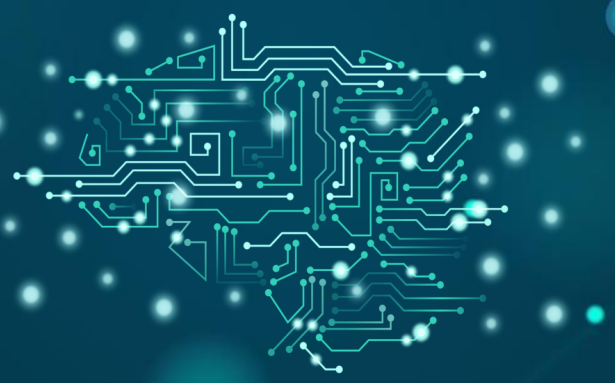
INDICATOR 11.3.1

**LEGEND**

-  YOLO
-  ResUNet
-  Ground truth







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**Thank you!**

**AI**