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**COOPERATION**  
FORWARD

# Monitoring the state of the environment at the petroleum port of Mlaka



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Air quality

Seawater quality

Soil quality

Marine sediment quality

Biocenological analyses



PIXEL- Port IoT for Environmental Leverage  
H2020-EU.3.4. – Smart, Green And Integrated  
Transport

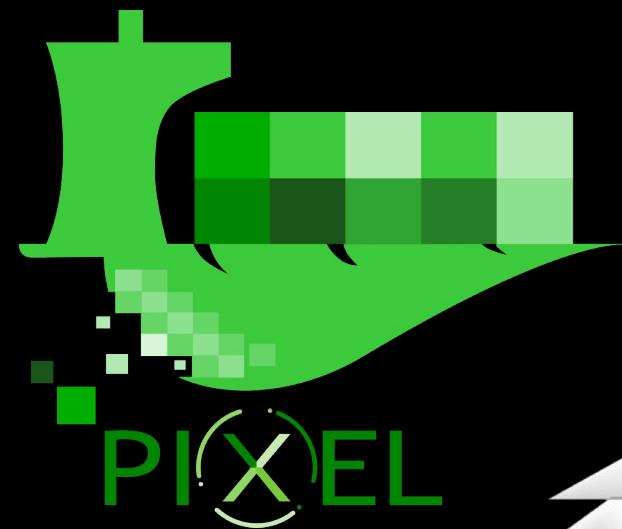
Topic: MG-7-3-2017 – The Port of the future

Contract Number: 769355

EC funding: 4 890 222,50 €

Duration: 1 May 2018 – 30 April 2021

15 partners













N45°20'31.2"

Z1 AP Mlaka (SO<sub>2</sub>, NO<sub>2</sub>)

N45°20'5.28"

Z2 Krešimirova 52 (PM<sub>10</sub>)

Z3 Krešimirova 38 (PM<sub>10</sub>)





## Ordinance on Air quality monitoring (Official Gazette 79/17)

Air quality: I category



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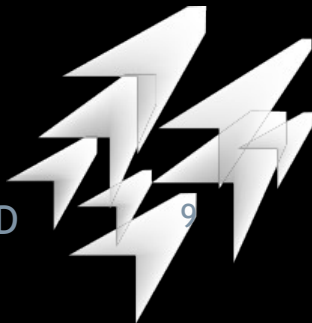


## Seawater quality

4 locations, two inside the port and two outside the port

- water temperature
- transparency
- pH
- salinity
- DO (dissolved oxygen)
- % of oxygen saturation
- concentration of hydrocarbons
- concentration of polycyclic aromatic hydrocarbons

Seawater of good ecological status!





T1

T2

M1

M2

S1

M3

M4

S2

E 14°24'51.84"



## Marine sediments

2 locations, one inside the port and one outside the port

- PAHs
- alkanes
- BTEX
- Heavy metals (Cu, Cr, Hg, V, Zn, As, Cd i Sn)

High concentrations of PAHs and heavy metals!





T1

T2

M1

M2

S1

M3

M4

S2

E 14°24'51.84"



## Soil

### 2 locations

- PAHs
- alkanes
- BTEX
- Heavy metals (Cu, Cr, Hg, V, Zn, As, Cd i Sn)

High concentrations of PAHs and heavy metals! The concentration increases with depth!









## Biocenological analyses

### 1 transect inside the port

A total of 23 species of flora and 38 species of fauna have been identified. The biological diversity is relatively low and is characteristic of eutrophic and somewhat degraded environments with heavy sedimentation which are under the influence of anthropogenic factors.

Presence of the bivalve *Mytillus galloprovincialis* indicates an inflow of freshwater from land





## Conclusions

Air quality – I category (not polluted)

Sea water quality – good ecological status (but not the best)

Sea sediments – high concentration of PAHs and heavy metals

Soil – polluted with PAH and heavy metals, concentration of tar increases with depth

Biocenological analyses – degraded habitats, eutrophicated

