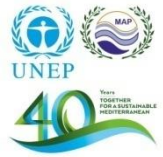
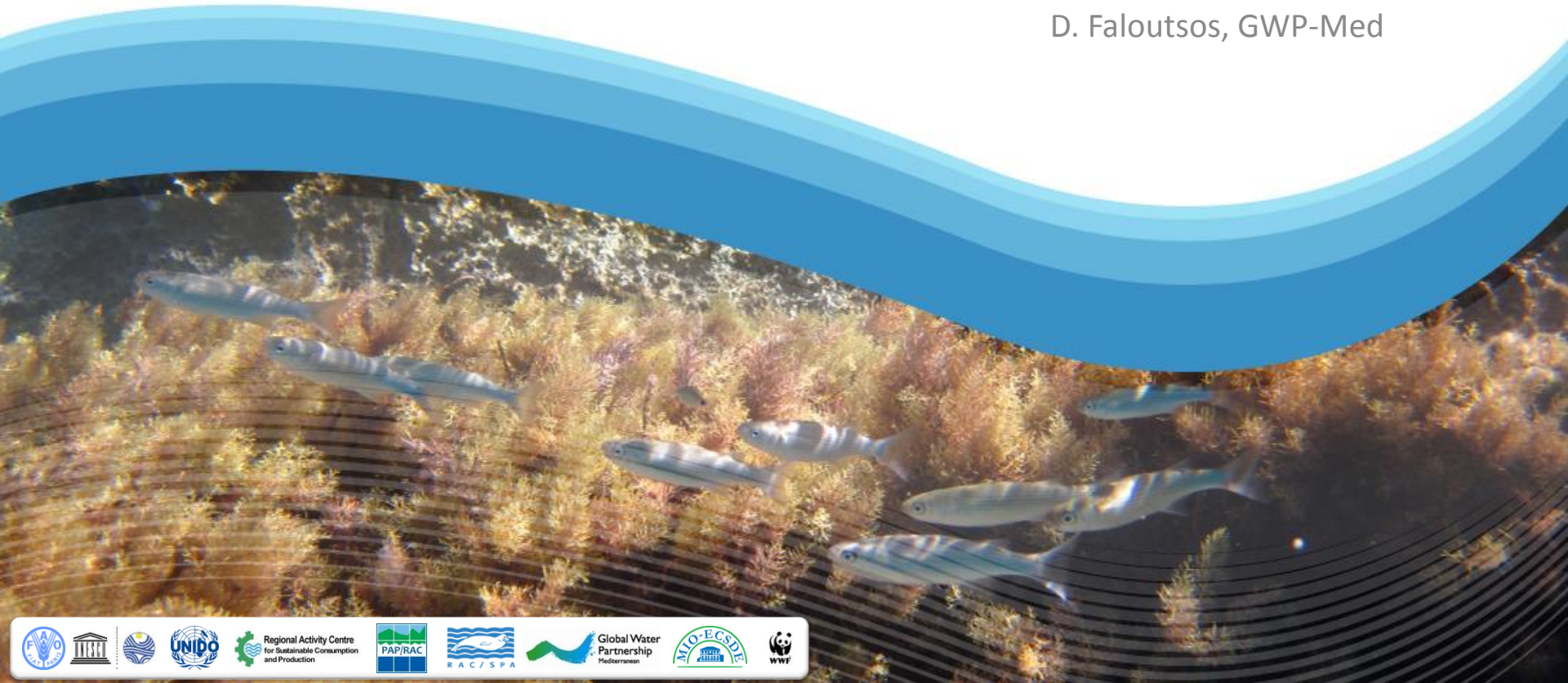
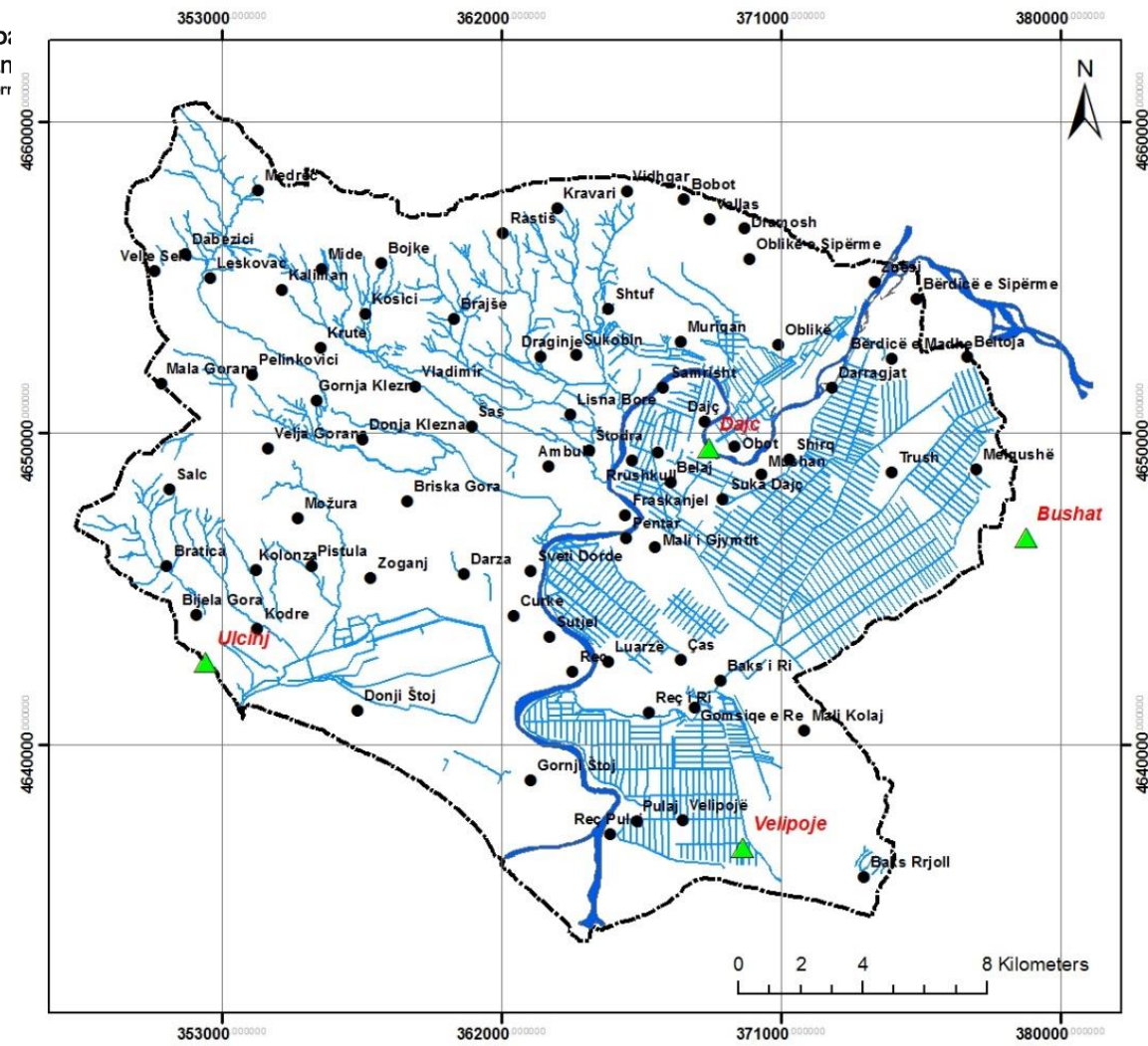


TRANSBOUNDARY INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN FOR BUNA/BOJANA



D. Faloutsos, GWP-Med

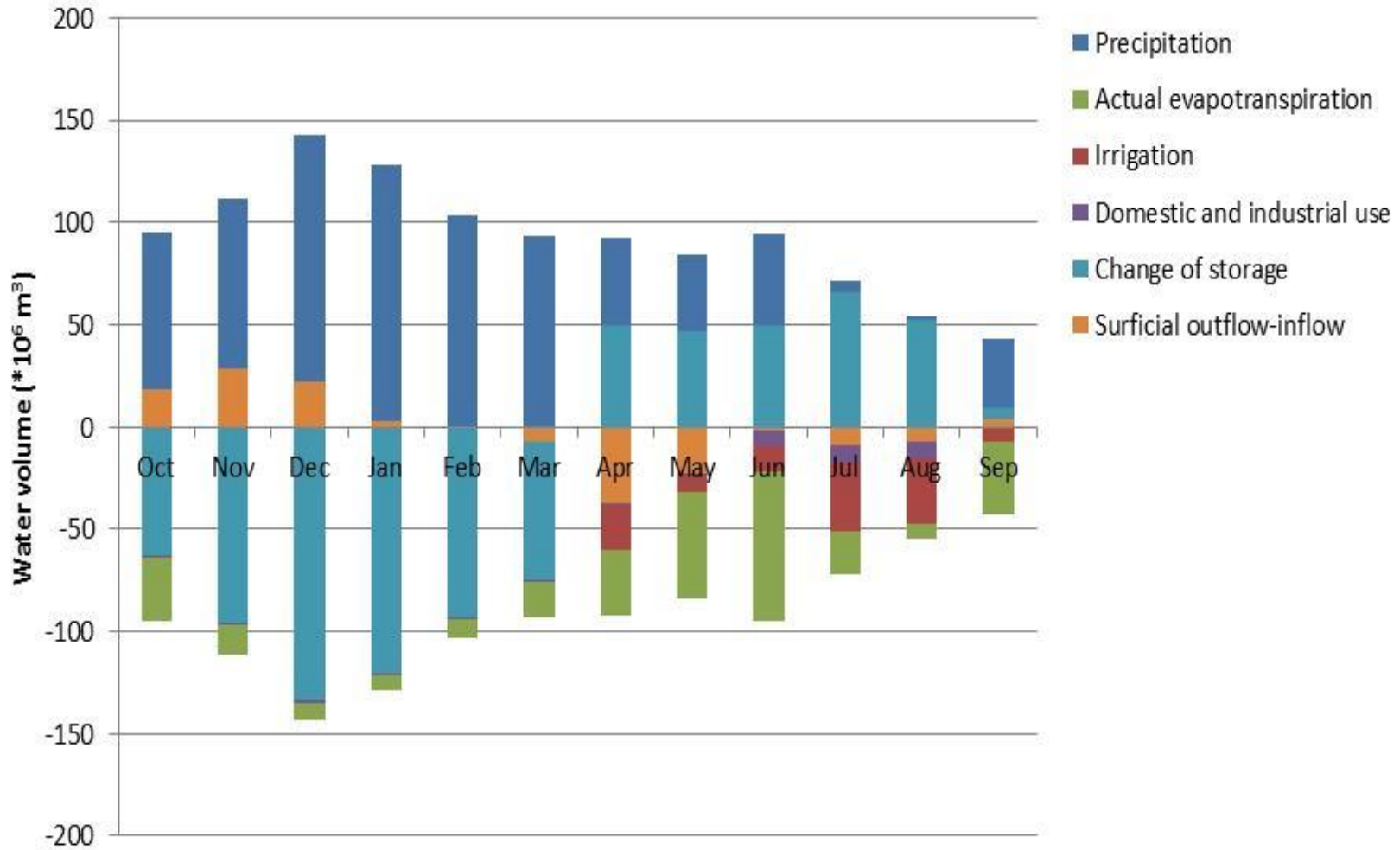




Legend

- ▲ Meteo
- City
- Hydrography
- Rivers

Hydrometeorological Stations used



P R E S S U R E S

1. Unsustainable territorial/spatial development including:
 - a. Insufficiently regulated urban development
 - b. Over-allocation of land for building in Montenegro
 - c. Lack of territorial plans in Albania
2. Unsustainable solid waste management
3. Unsustainable wastewater management
4. Unsustainable agricultural practices
5. Stockbreeding

S T A T E

19. Landscape quality of the area is degraded.
20. There is degradation (fragmentation) of coastal habitats, primarily the dunes at Velika Plaža and on the Rrjolli part.
21. Smaller wetlands zones (in Albania) are shrinking.
22. There is loss of rare species in the halophyte vegetation belt.
23. Fish migration in Bojana / Buna river is impeded.
24. There is decrease of fish catch in past 25 years at the level of 20-80% depending on the species (according to Albanian fisheries association).

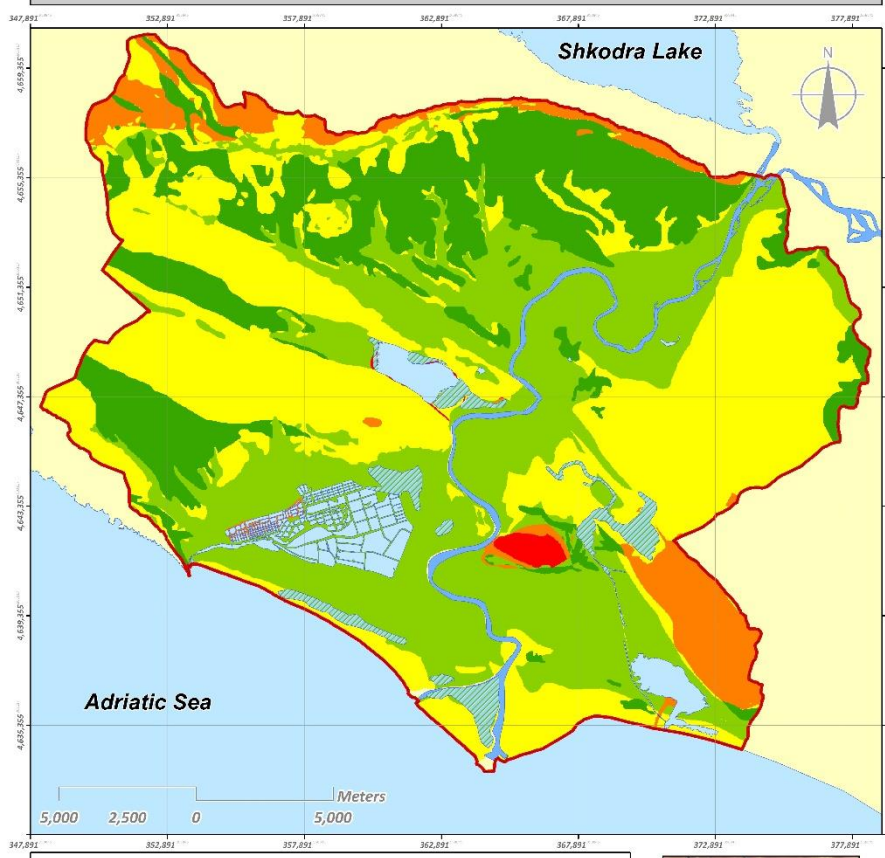
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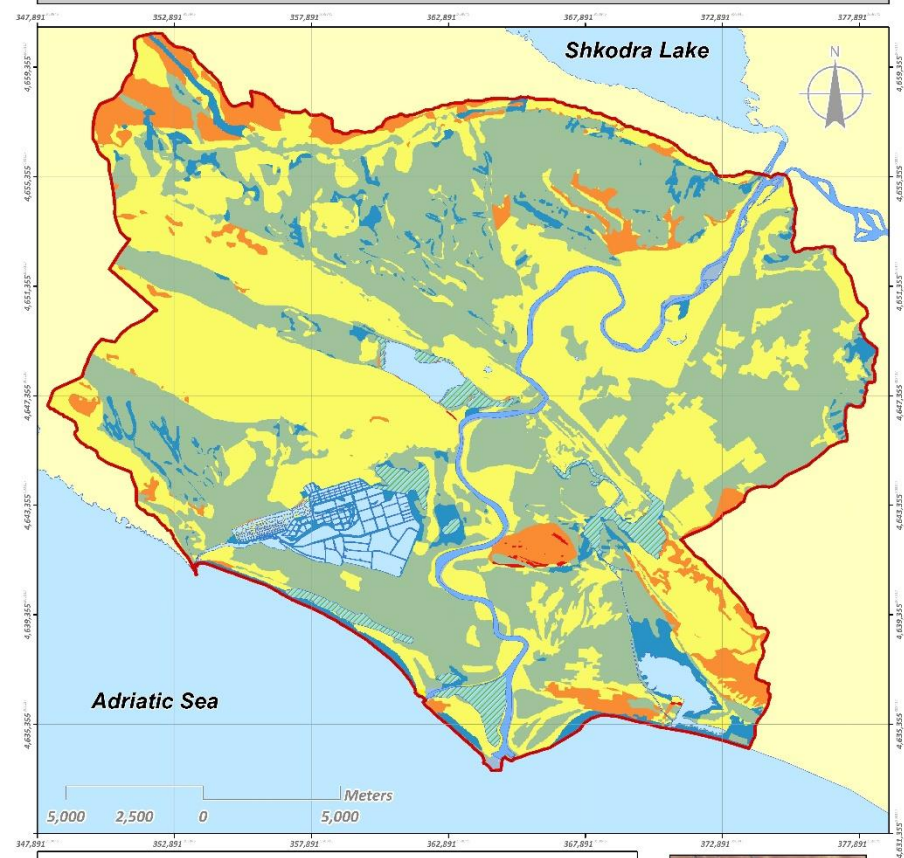
S T A T E

14. The quality of Bojana/Buna River in terms of ammonium and BOD5 concentrations deteriorates from its sources to its mouth.
15. There are elevated mercury concentrations in Lake Shasko in Montenegro. Mercury concentration is above limits also in Viluni lagoon in Albania.
16. The ecological quality -in accordance to the WFD- of the coastal zone waters is classified as “poor”.

VULNERABILITY MAP - COP



RISK MAP



Legend:

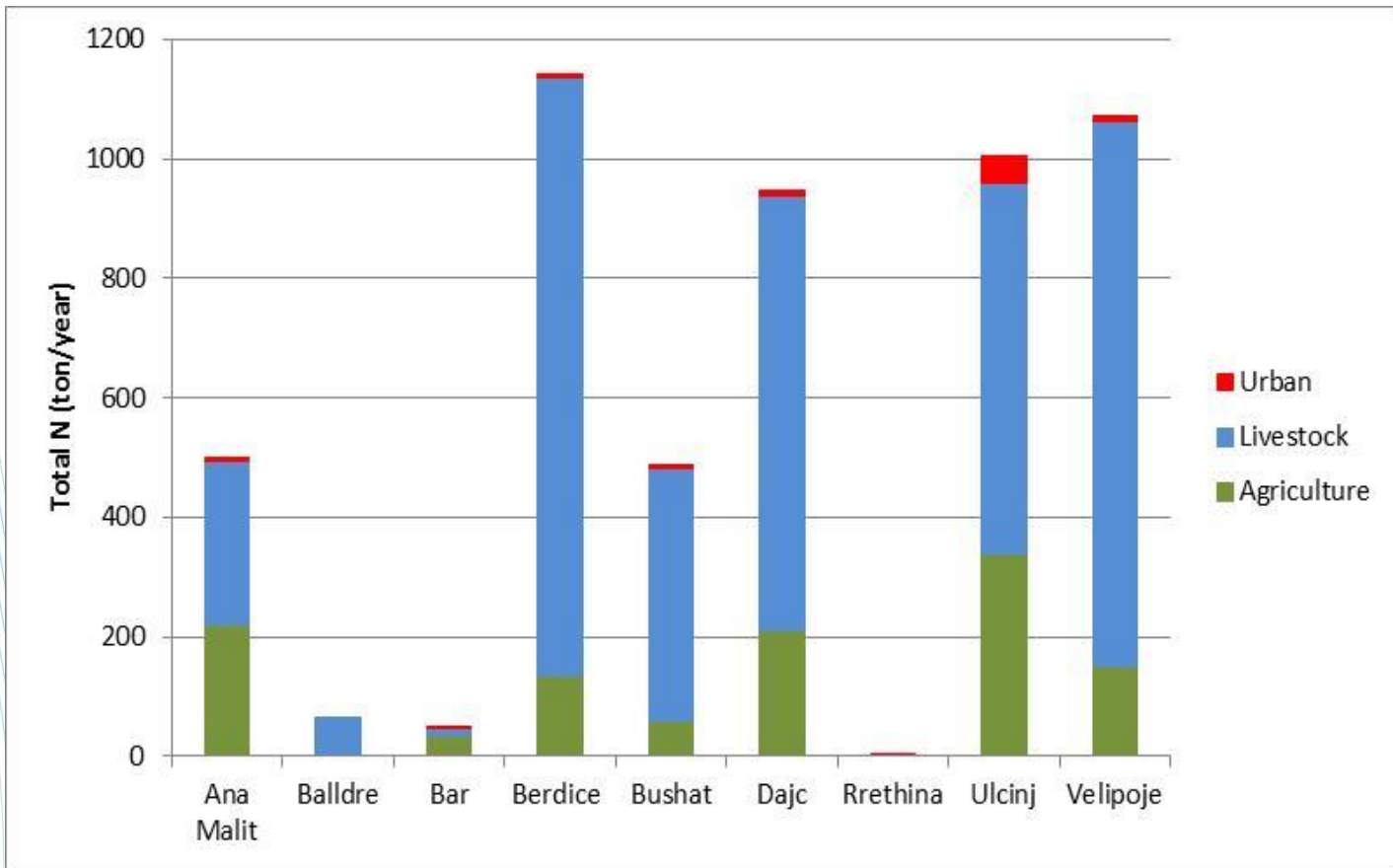
- Wetland
 - River watershed (COP map)
 - Waterbodies
 - Buna/Bojana River
- Groundwater vulnerability (COP map)**
- Very high
 - High
 - Moderate
 - Low
 - Very low



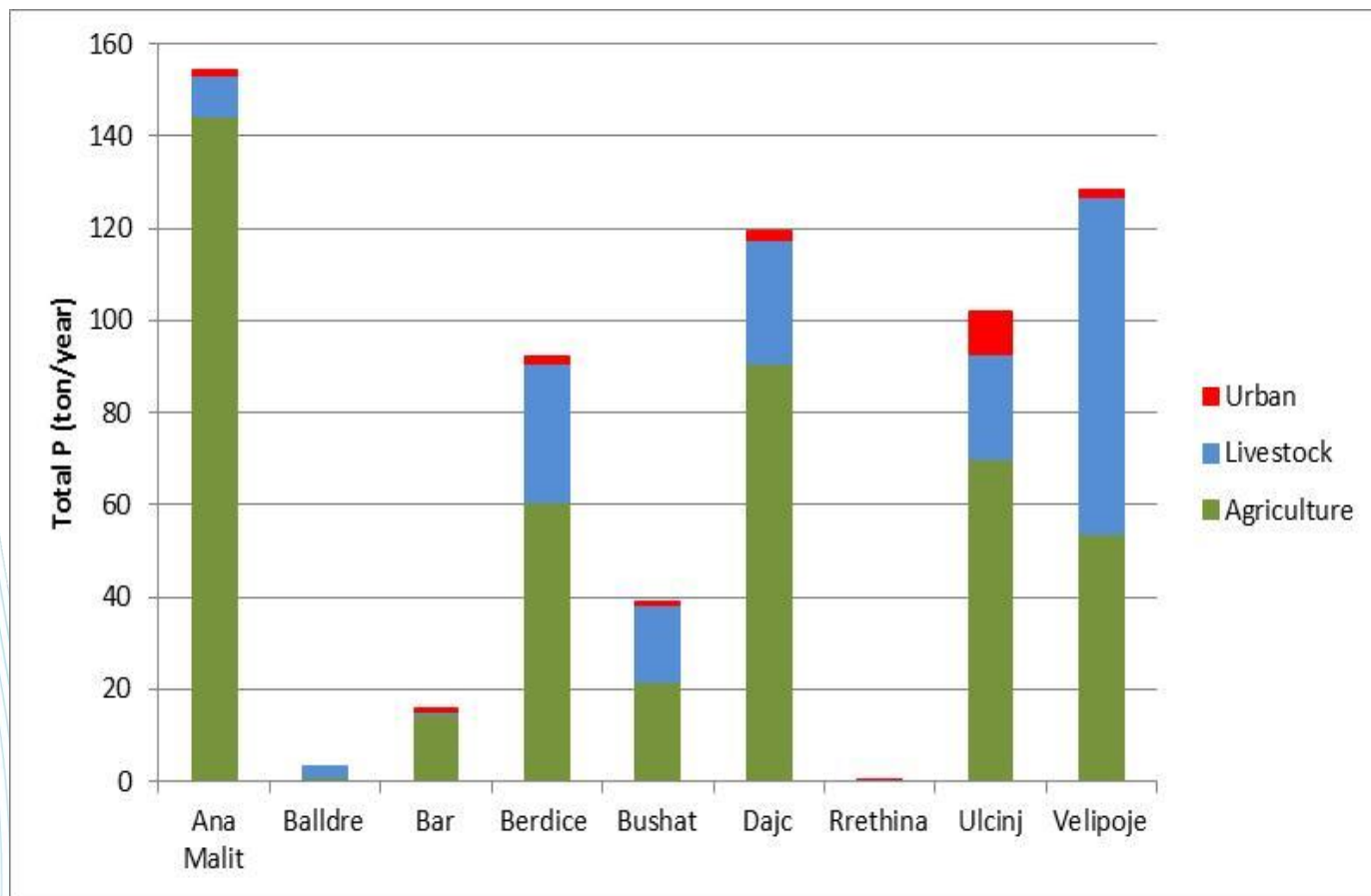
Legend:

- Wetland
 - River watershed
 - Waterbodies
 - Buna/Bojana River
- Risk map**
- Very low
 - Low
 - Moderate
 - High
 - Very high



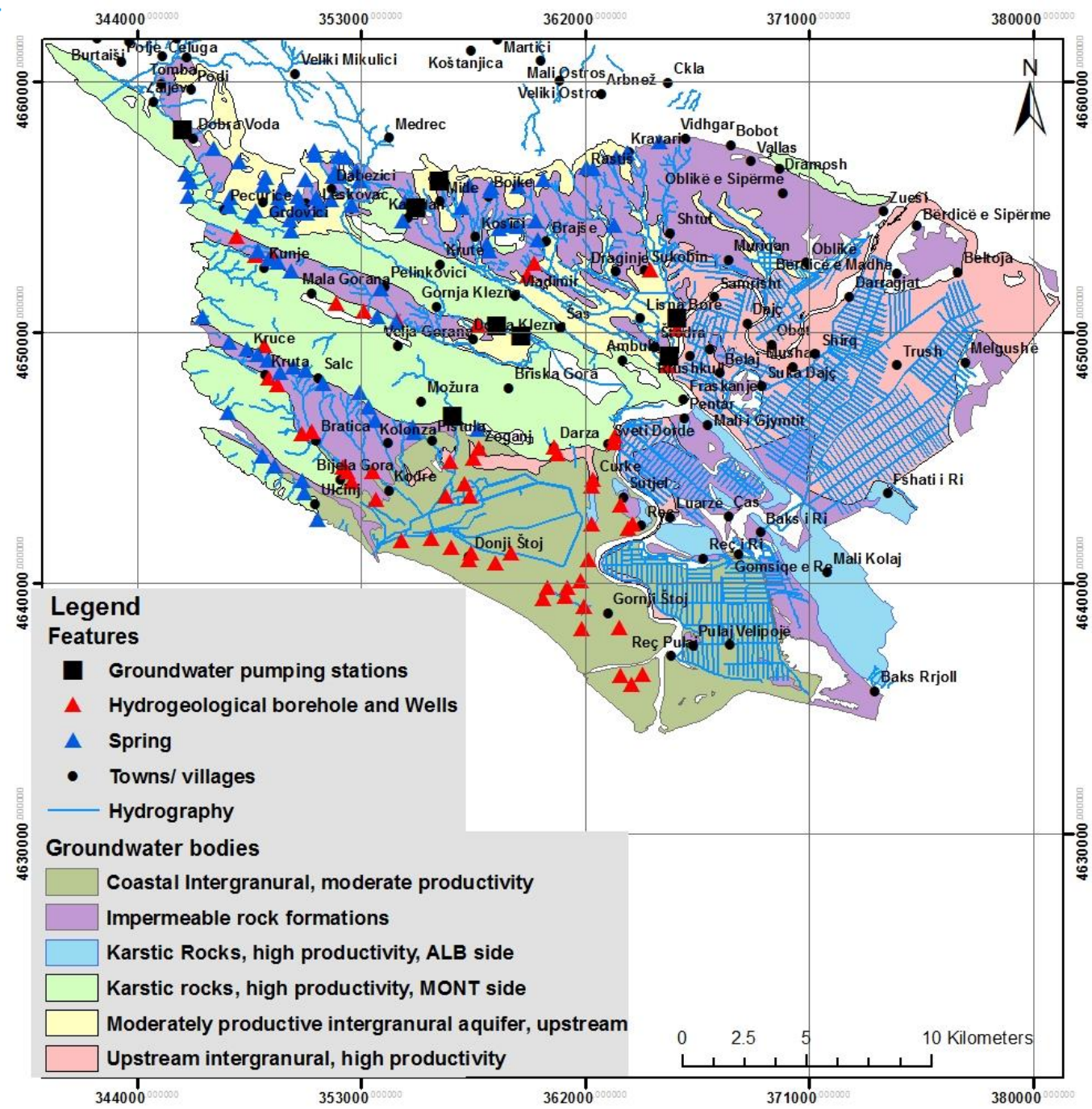


Distribution of total N per municipality / commune of Buna / Bojana watershed

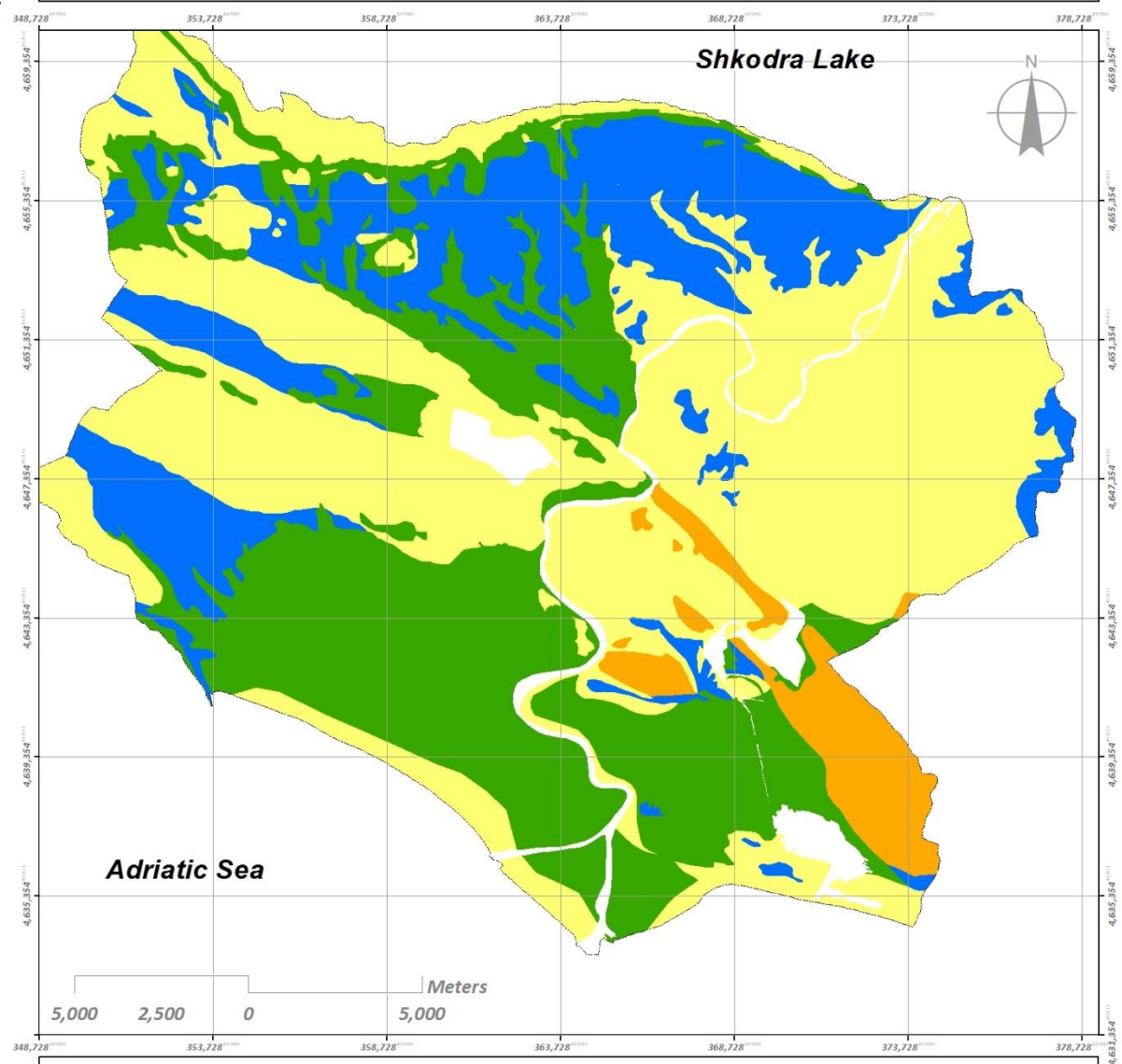


Distribution of total P per municipality / commune of Buna / Bojana watershed

Global Water

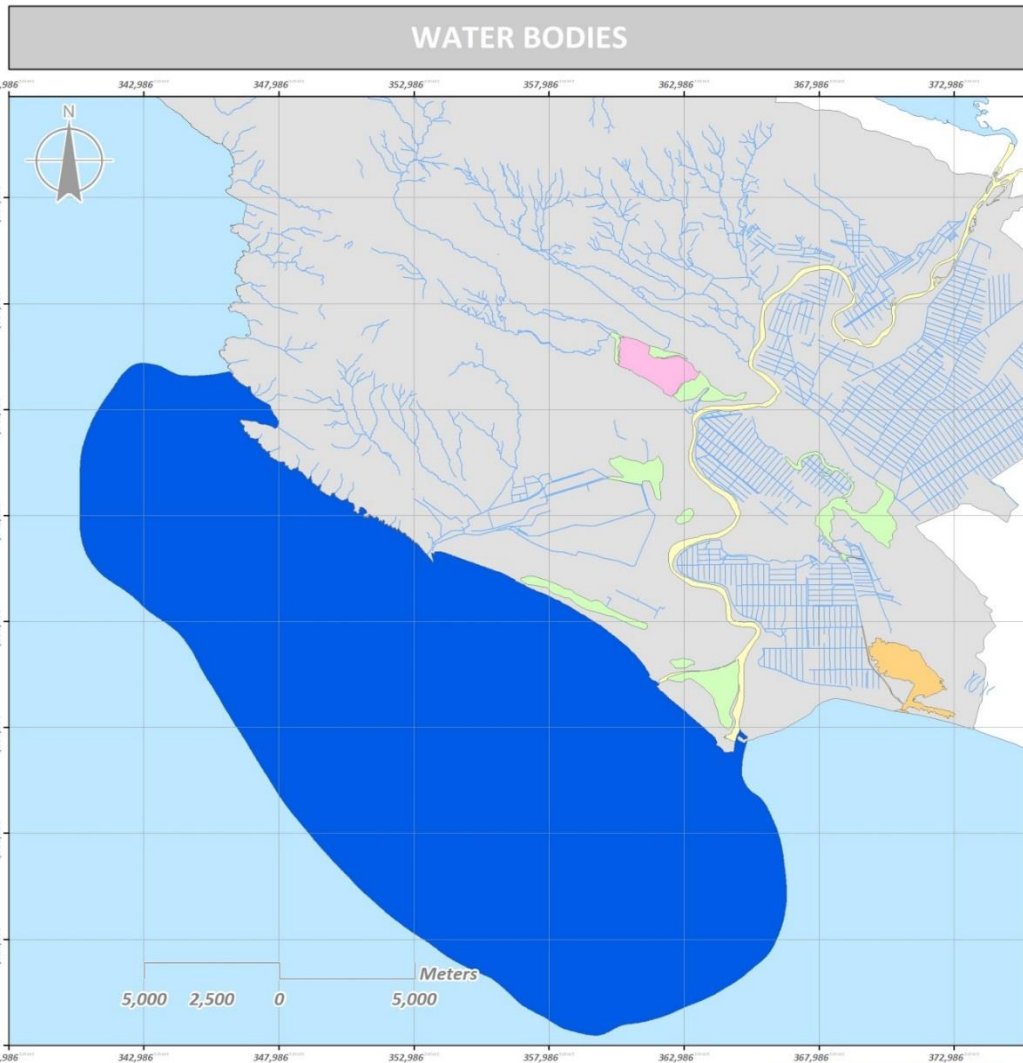


POTENTIAL GROUNDWATER STATUS



Legend:
Potential GW status

- High
- Good
- Moderate
- Poor

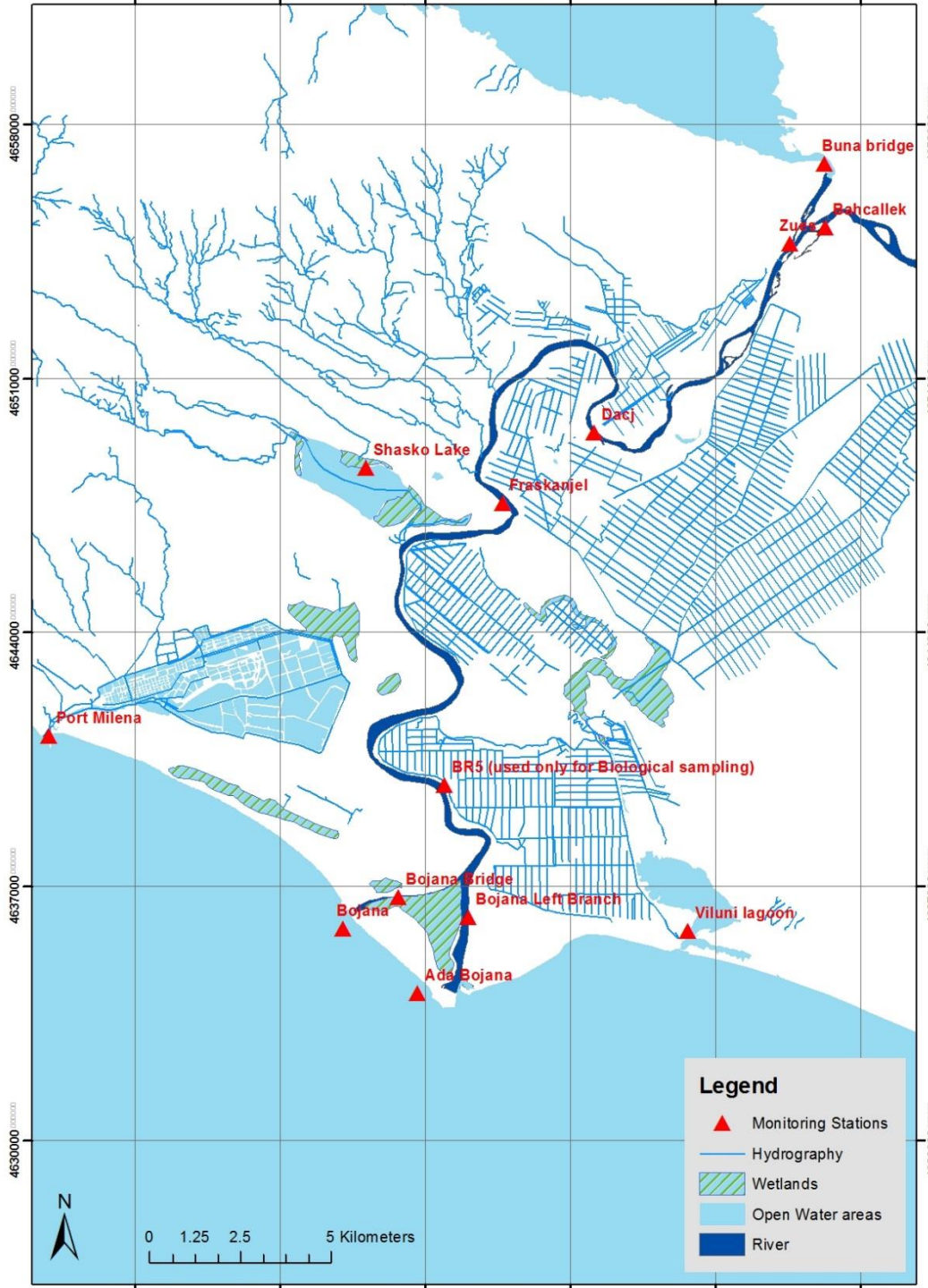


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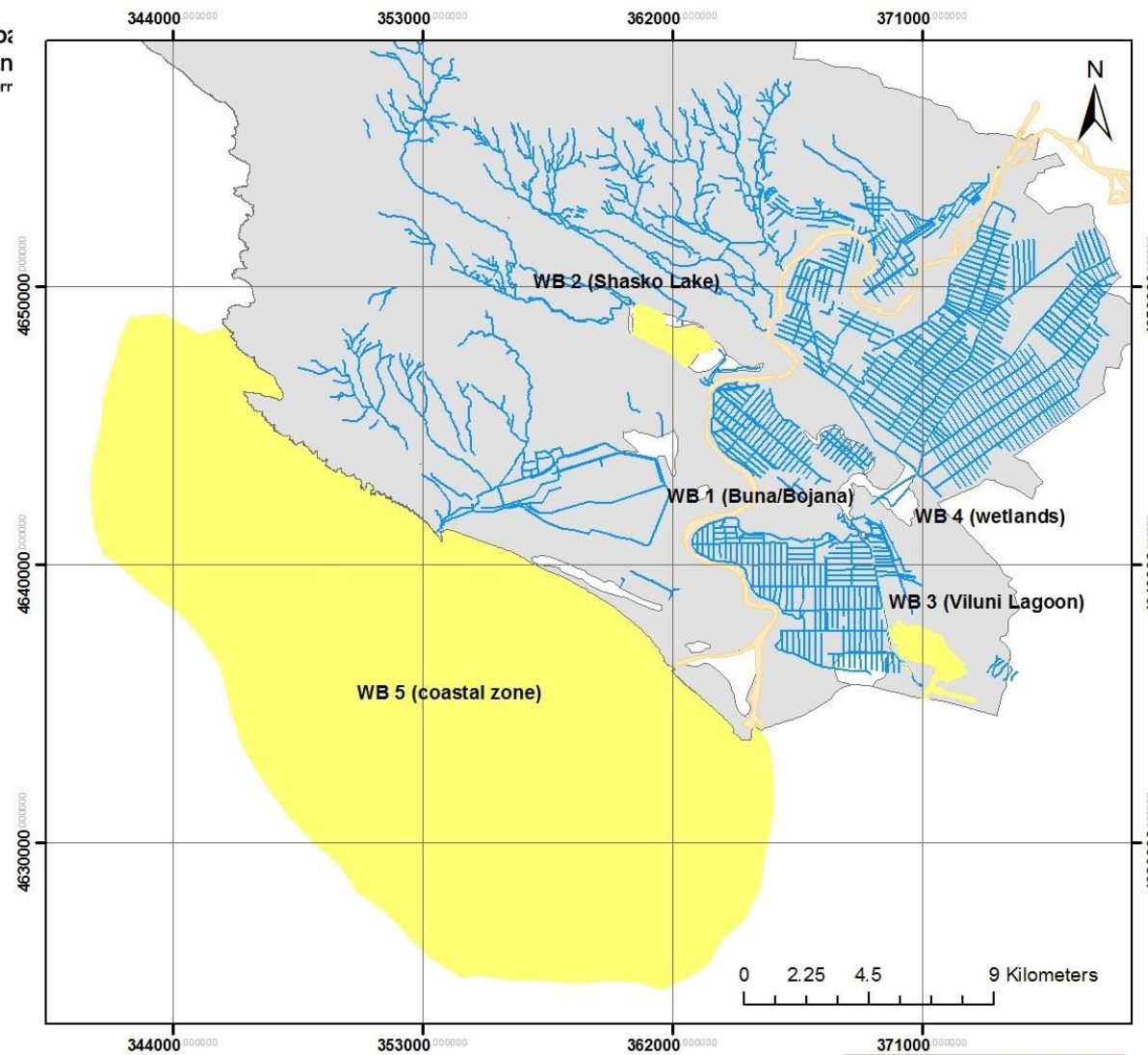
Water bodies

- WB 1 (Buna/Bojana)
- WB 2 (Shasko Lake)
- WB 3 (Viluni Lagoon)
- WB 4 (wetlands)
- WB 5 (coastal zone)
- Hydrography
- Study area





Strategic Partnership for the Mediterranean Sea Large Marine Ecosystem										
WBs		Stations	Physicochemical Quality	Potential Specific Pollutants	Chemical – Physicochemical status	Biological Status ¹	Ecological status	Chemical status	Overall status	Water Body status
	Drin	Bachalleck	Poor	Moderate	Poor	Poor	Poor	Moderate	Poor	Poor
	Skadar/Shkoder outflow	Buna Bridge	Poor	Moderate	Poor	Poor	Poor	Moderate	Poor	Poor
1	Buna/Bojana	Dajc	Moderate	Moderate	Moderate	Poor	Poor	Moderate	Poor	Poor
		Franskanjel	Moderate	Moderate	Moderate	Poor	Poor	Moderate	Poor	
		Bojana Bridge	Poor	GH	Poor	Poor	Poor	Moderate	Poor	
		Bojana Left Branch	Poor	GH	Poor	Poor	Poor	Moderate	Poor	
2	Shasko Lake	Shasko Lake	Moderate	GH	Moderate	²	≤ Moderate ³	Moderate	≤ Moderate	≤ Moderate
3	Viluni lagoon	Viluni lagoon	Bad	GH	Bad	²	≤ Moderate ³	Moderate	≤ Moderate	≤ Moderate
4	Wetlands		²	²	²	²	²	²	²	²
5	Costal marine zone	Ada Bojana	Bad ⁴	²	²	²	≤ Moderate ⁵	²	≤ Moderate	≤ Moderate
		Bojana	Bad ⁴	²	²	²	≤ Moderate ⁵	²	≤ Moderate	
		Port Milena	Bad ⁴	²	²	²	≤ Moderate ⁵	²	≤ Moderate	

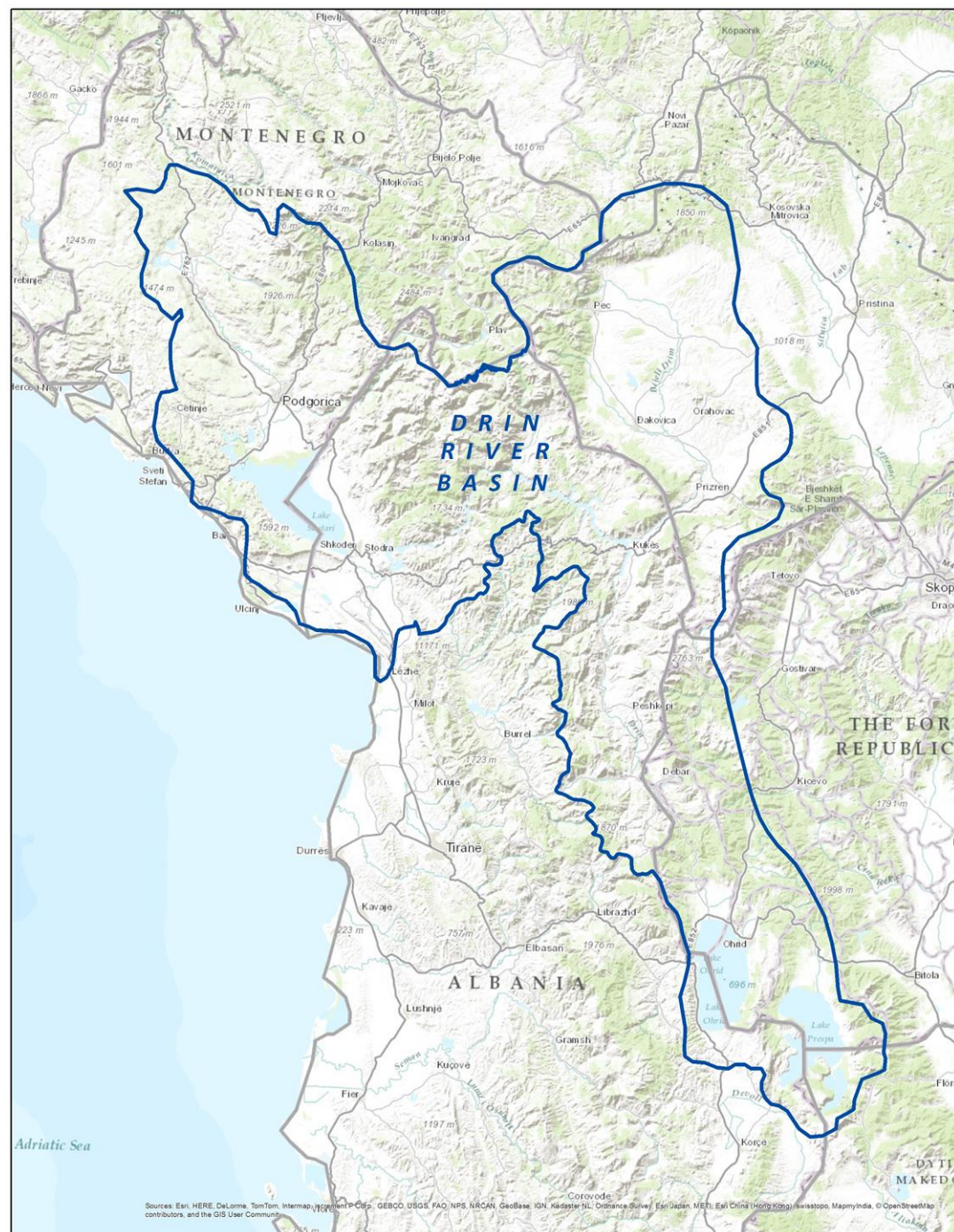


Legend

Water bodies ecological status

- High
- Good
- Moderate
- Poor
- Bad





Sources: Esri, HERE, DeLorme, TomTom, Intermap, incrementP Corp., GEBCO, USGS, FAO, NPS, NRCAN, Geobase, IGN, Kadaster NL, Ordnance Survey, Esri, Japan, METI, Esri, China (Hong Kong), Swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

P R E S S U R E S

6. Water flow regime in the Drin
7. Over-extraction of groundwater resources
8. High sediment input
9. Bad maintenance of the flood/drainage infrastructure
10. Unsustainable forests management
11. Unsustainable fisheries management
12. Unsustainable legal as well as illegal hunting

S T A T E

7. The regime of coastal dynamics has altered.
8. There is also erosion of the land adjacent to the river.
9. The natural water flow regime of the Bojana/Buna has been disturbed.
10. The natural sediment flow regime had been disturbed.
11. Eutrophication is present in transitional and coastal waters.
12. Bojana/Buna river chemical status -in accordance to the WFD- is assessed as “lower than good”.
13. Indication of heavy metal pollution.

P R E S S U R E S

6. Water flow regime in the Drin
7. Possibly over-extraction of groundwater resources
8. High sediment input
9. Bad maintenance of the flood/drainage infrastructure
10. Unsustainable forests management
11. Unsustainable fisheries management
12. Unsustainable legal as well as illegal hunting

S T A T E

14. The quality of Bojana/Buna River in terms of ammonium and BOD5 concentrations deteriorates from its sources to its mouth.
15. There are elevated mercury concentrations in Lake Shasko in Montenegro. Mercury concentration is above limits also in Viluni lagoon in Albania.
16. The ecological quality -in accordance to the WFD- of the coastal zone waters is classified as “poor”.
17. There is possible decrease in groundwater levels and deterioration of its quality.
18. There are indications of saltwater intrusion



P R E S S U R E S

6. Water flow regime in the Drin
7. Over-extraction of groundwater resources
8. High sediment input
9. Bad maintenance of the flood/drainage infrastructure
10. Unsustainable forests management
11. Unsustainable fisheries management
12. Unsustainable legal as well as illegal hunting

S T A T E

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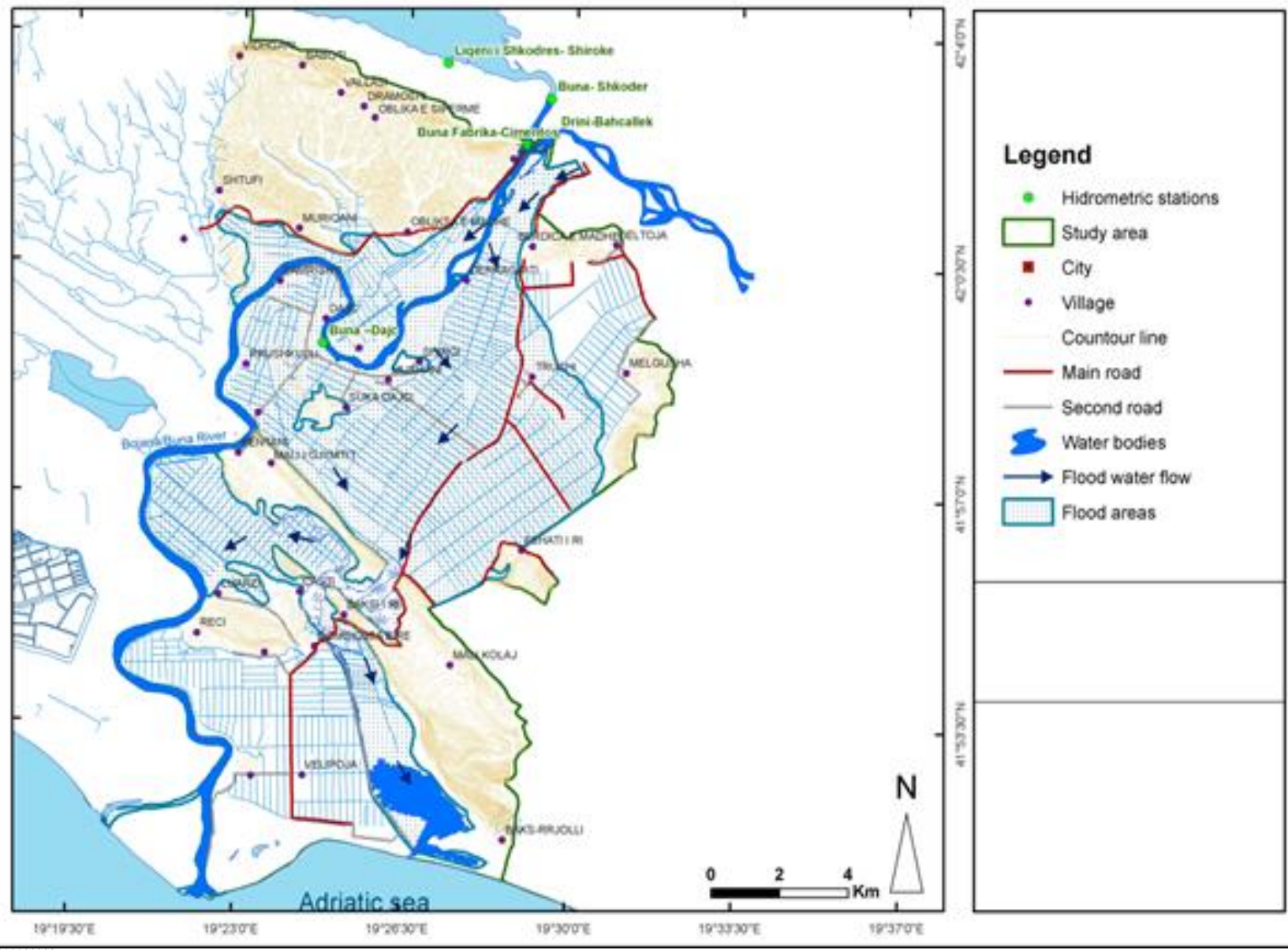
P R E S S U R E S

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7. Over-extraction of groundwater resources
8. High sediment input
9. Bad maintenance of the flood/drainage infrastructure
10. Unsustainable forests management
11. Unsustainable fisheries management
12. Unsustainable legal as well as illegal hunting

S T A T E

25. There are increased flood risks.





I M P A C T S

1. General degradation of the landscape due to unplanned, dispersed and rapid development.
2. Absence of essential infrastructure services.
3. 1. Visual pollution and considerable pollution risks.
2. Pollution of both the land/freshwater and marine environments.
3. There is reduced sanitary bathing quality at some areas.

I M P A C T S

4. The natural capital and resources of the area have been deteriorated.
 1. Ecosystems degrade in the delta as well as in the wetland zones resulting among others in the deterioration of the ecosystem services.
 2. Significant biodiversity loss – concentrated in the coastal area; considerable number of the waterfowl species in the Bojana/Buna Delta for example, are threatened and included in the lists of endangered species at local, regional and international level.
 3. The number of fish species in the river has declined.

I M P A C T S

5. There are indications of declining groundwater levels and seawater intrusion in the aquifers.
6. The economy is affected and so are the developmental potentials.
 1. There are commercial species that are no longer harvested.
 2. The loss of attractive natural areas threatens the potential for high-value tourism development.

I M P A C T S

7. Deterioration of the natural resources and the disturbance of the natural processes have introduced high uncertainty in local economic development planning:
 1. disturbed coastline dynamics that lead to erosion of parts of the coastal area and jeopardize infrastructure as well as tourism related investments.
 2. Intense urbanization often spreads over arable land leading to its overall reduction..
8. Increased flooding risks due to anthropogenic pressures and the increased potential for extreme events due to climate change threaten infrastructure, property and human safety.

DRIVERS

- EU Accession
- Policy and legal framework
- Weak institutional and technical capacity
- Economic weakness; market transition
- Structural issues in agriculture
- Coastal attractiveness
- Climate variability and change
- Demographic changes
- Developmental planning & prioritisation
- Upstream drivers
- Out-dated or inadequate infrastructure
- Lack of awareness
- Transboundary nature of the area

Thank you for your attention