Implications of DRIMON results seen in light of the new management requirements in Europe (EU Water Framework Directive)

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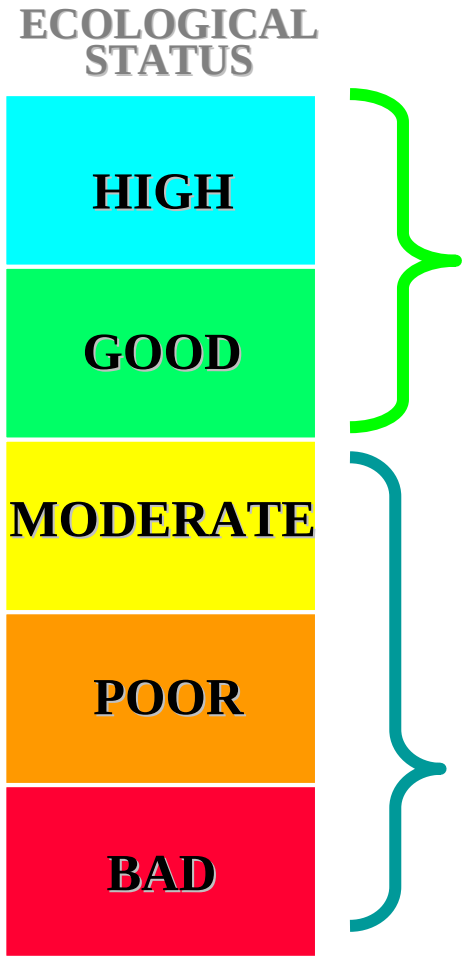
EU Water Framework Directive
- what's in it for managers?

- Sets environmental goals for every single water body in the European Union!
- Sets requirements for monitoring
- Sets requirements for proper mapping (characterisation) of water resources and their present environmental status
- Demands mitigation measures where the water quality is not acceptable

Lakes Prespa and Skadar/Shkodra

- Lake Prespa is already within the European Union through Greece
- EU Water Framework Directive + CIS no. 7 “In the case of an international river basin district extending beyond the boundaries of the Community, Member States shall endeavour to produce a single river basin management plan…”
- Lake Skadar/Shkodra is still outside -- but the UN convention on Transboundary Waters (1992) is still valid: Riparian countries of international waters shall
- establish and implement common programmes for monitoring
- agree upon which pollution parameters shall be regularly monitored.
- harmonise the rules for the monitoring programmes

How to define a goal of ”good status”?

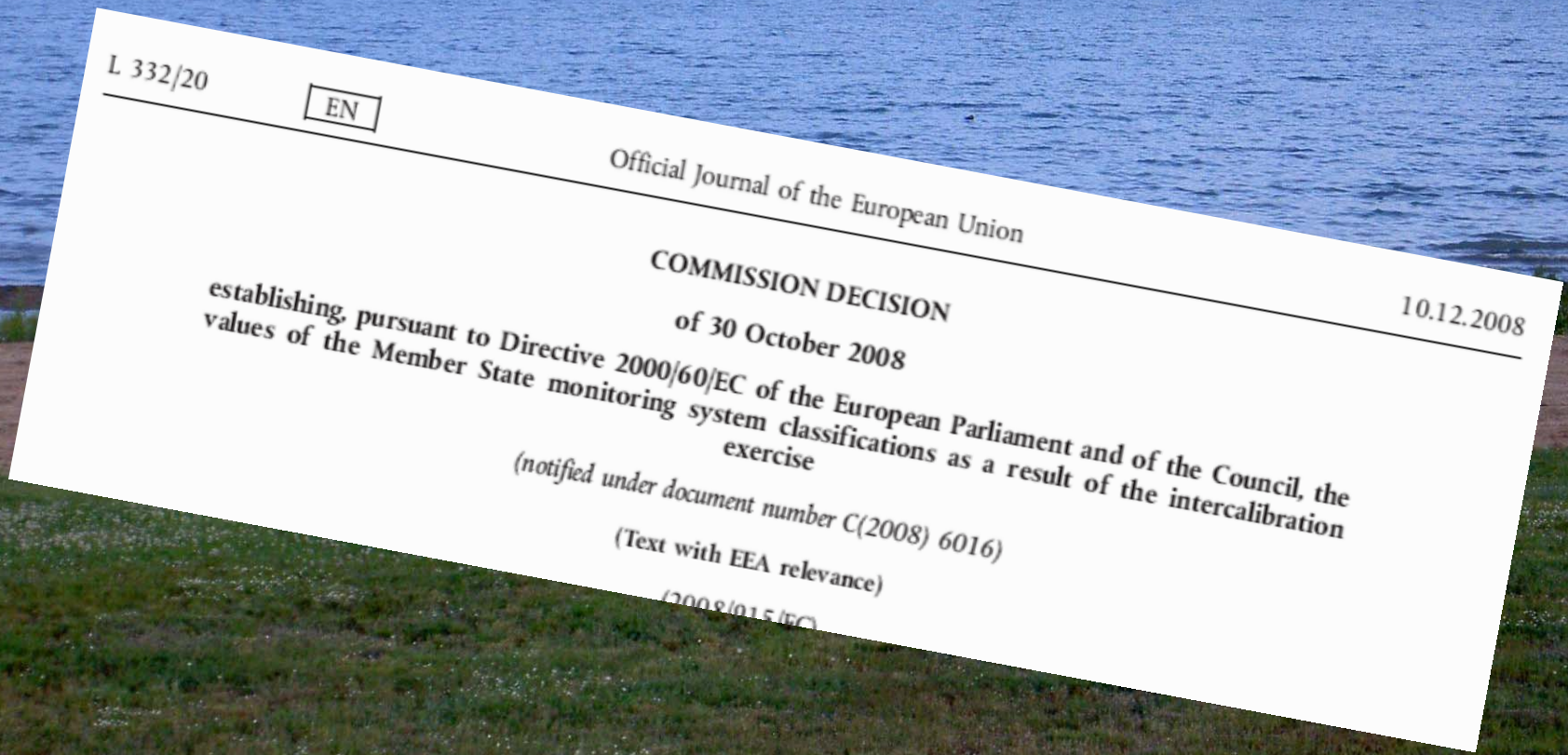


By 2015, all water bodies should have a ”good” status.

Skadar and Prespa??

These will be water bodies AT RISK of not achieving a good status.

Setting environmental goals for Prespa and Shkodra/Skadar



L 332/20 EN Official Journal of the European Union 10.12.2008

COMMISSION DECISION

of 30 October 2008

establishing, pursuant to Directive 2000/60/EC of the European Parliament and of the Council, the values of the Member State monitoring system classifications as a result of the intercalibration exercise

(notified under document number C(2008) 6016)

(Text with EEA relevance)

(2008/915/EC)

Skadar

L-CB – Lakes Central Europe and Baltic States

Type	Lake characterisation	Altitude (m above sea level)	Mean depth (m)	Alka-linity (meq/l)	Hydro-logical residence time (years)
L-CB1	Lowland, shallow, calcareous	<200	3-15	>1	1-10
L-CB2	Lowland, very shallow, calcareous	<200	<3	>1	0.1-1

Mix

Skadar

Chl a as the environmental goal between good and moderate

Type	Lake characterisation	Altitude (m above sea level)	Mean depth (m)	Alka-linity (meq/l)	Hydro-logical residence time (years)	Chl a (µg/l) good-moderate boundary
L-CB1	Lowland, shallow, calcareous	<200	3-15	>1	1-10	8-12
L-CB2	Lowland, very shallow, calcareous	<200	<3	>1	0.1-1	21-25

Skadar

Environmental goals for Skadar: Chl a

- **Environmental goal for Chl a: 15-19 µg/l.**
- **If a good water discharge is maintained through the lake, it is likely that it will sustain about 19-20 µg/l, but if the hydrological residence time increases (due to, e.g., the hydropower developments and/or massive water extraction for drinking water purposes), then it is likely that the lower boundary value should be used, i.e. about 15 µg/l.**
- **Lake Skadar at Vranjina: 11-12 µg/l.**

(for the period April – October 2008 at 2 meters depth)

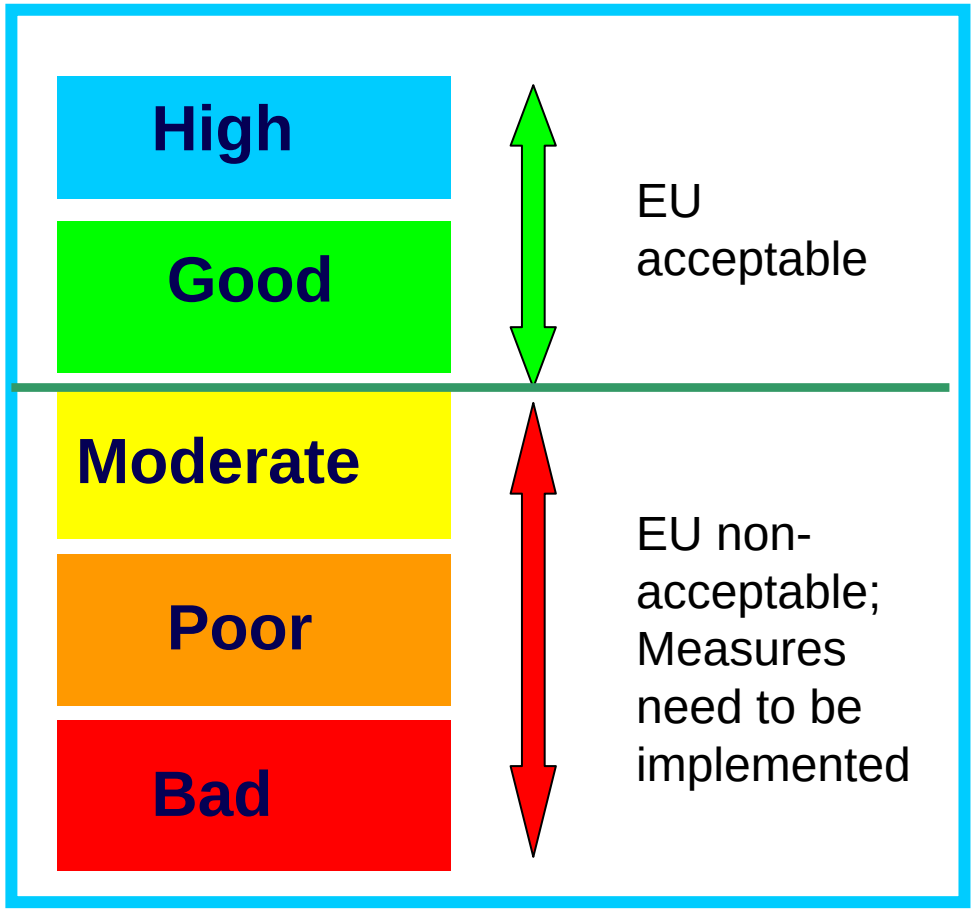
The maximum value was, however, about 30 µg/l.

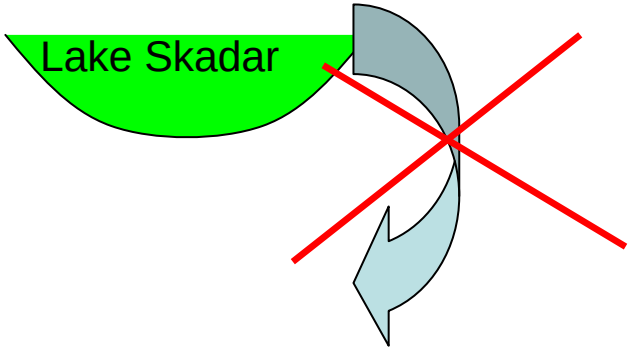
Skadar

Suggested Goal for Total phosphorus in Lake Skadar

- **High to good ecological state in this type of lakes: about 19-20 µg/l Cardoso et al. 2008)**
- **In Skadar at Vranjina: 21 µg/l, with a maximum 38 µg/l.**
- **In Buna in Albania: 12 µg/l, with a maximum of 19 µg/l.**

Skadar





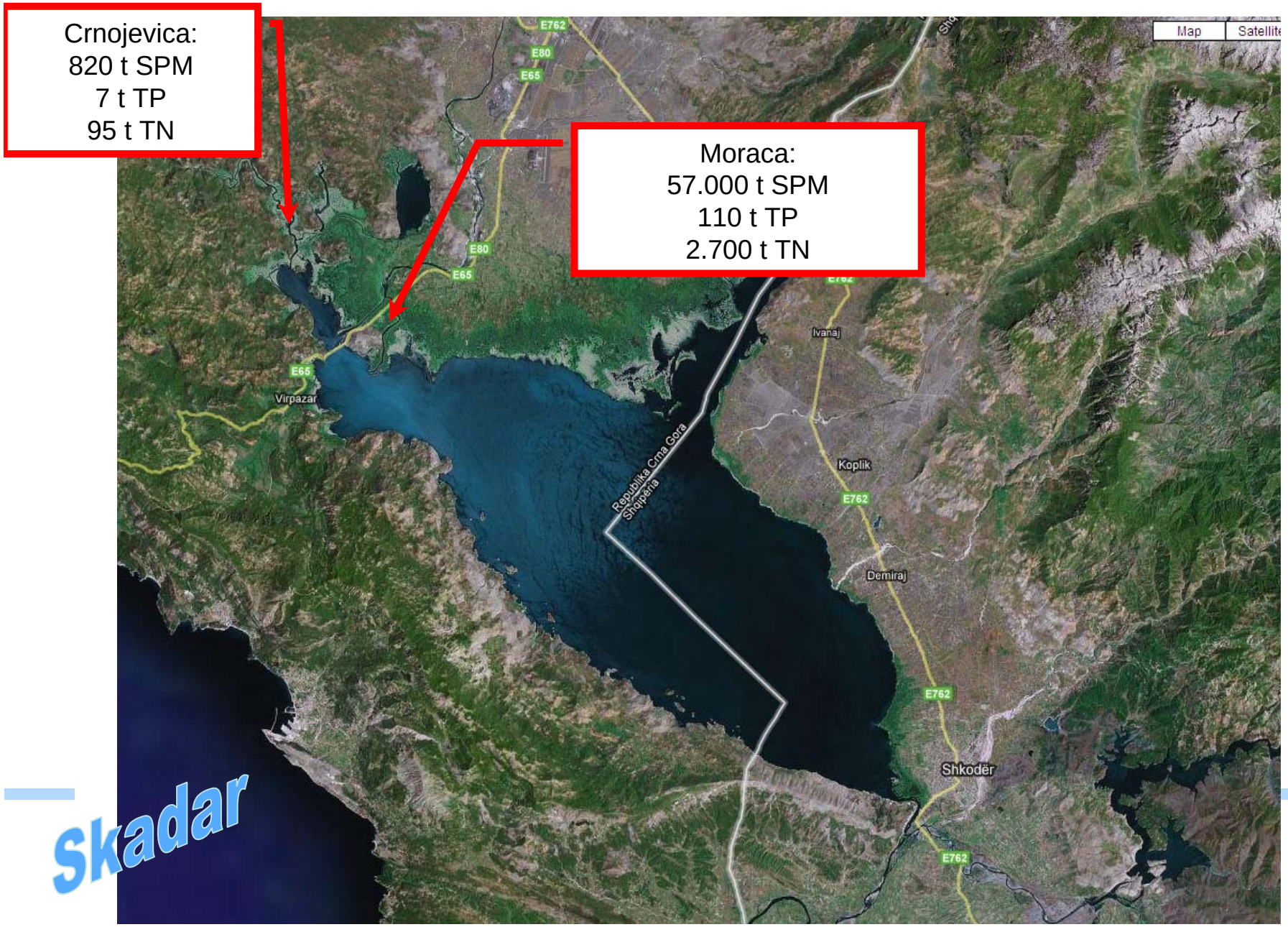
Once a lake is within the Good quality–status, the managers are required to keep it that way.

Skadar

Threats and challenges

- **High nutrient inputs**
- **Hydropower development in Moraca and Drin**
- **Extraction of water from the lake (the two latter can reduce the high throughflow)**

High inputs of SPM, TP and TN (based on load estimates 2008).



Skadar

Chl a as the environmental goal between good and moderate

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Prespa

Prespa

Lake Types	Explanation	Chl a Good-Moderate boundary (µg/l)
Central/ Baltic L-CB1	**Lowland (<200 masl),** mean depth 3-15 meter, calcareous, hydrological residence time 1-10 yrs	8.0-12.0
Mediter-ranean L-M8	**Reservoirs**, 0-800 masl, **mean depth above 15 meters**, calcareous, large (lake surface >0.5 km^2 and catchment area above 20.000 km^2)	4.2-6.0
Alpine L-AL4	Mid-altitude (**200-800 m** asl), **mean depth 3-15 meters**, moderate to high alkalinity and lake size **large** (above 0.5 km^2).	6.6-8.0

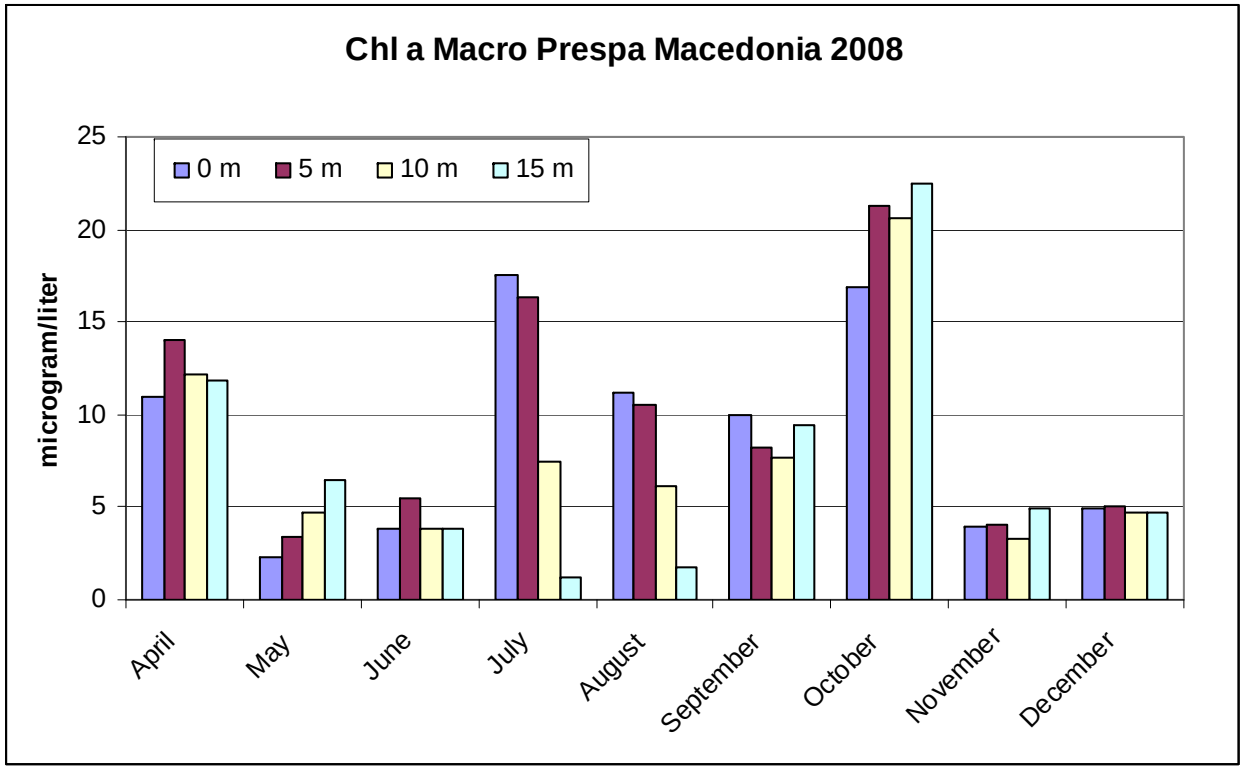
Prespa

Total P – environmental goals for Prespa:

- For the lake type: 8.2 µg/l (Cardoso et al 2008)
- From sediment cores Lake Prespa (Matzinger et al 2006): Reference conditions are ~20 µg/l
- If above 35 µg/l then eutrophic (OECD 1982).

Prespa

Chl a – (Macedonian station): Goal: 6.6-8 µg/l



Mean surface concentration (0-5 m) is **10.7** µg/l

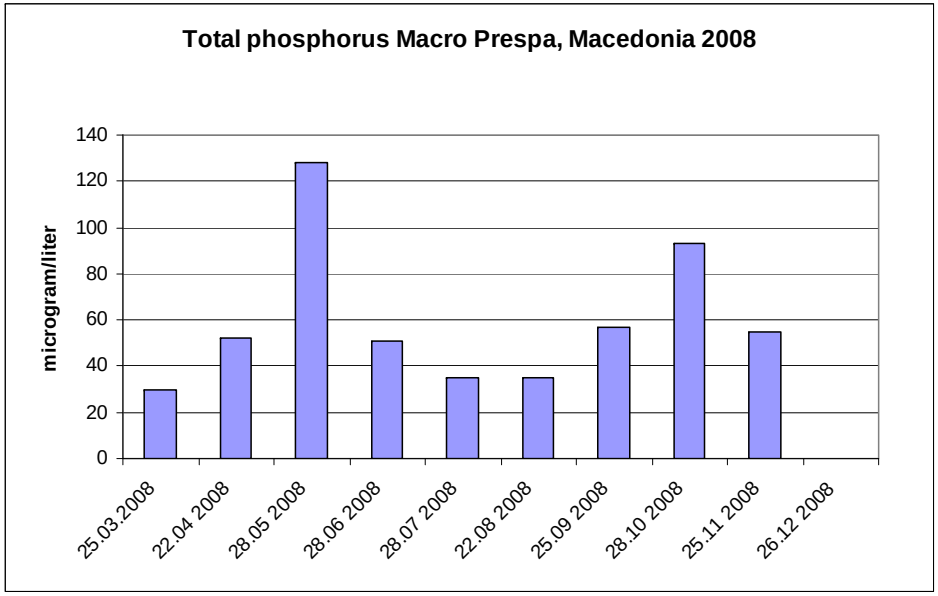
– *this is 2.7* µg/l *more than the environmental goal*

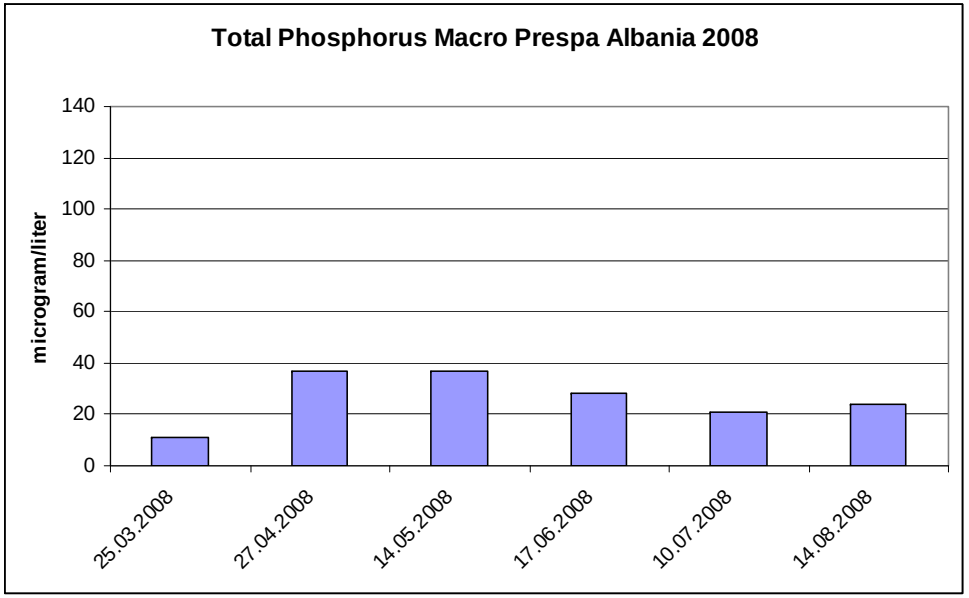
Prespa

State: Total Phosphorus Goal= ? (8-20…)

Macedonia: 60 µg/l

Albania 26 µg/l



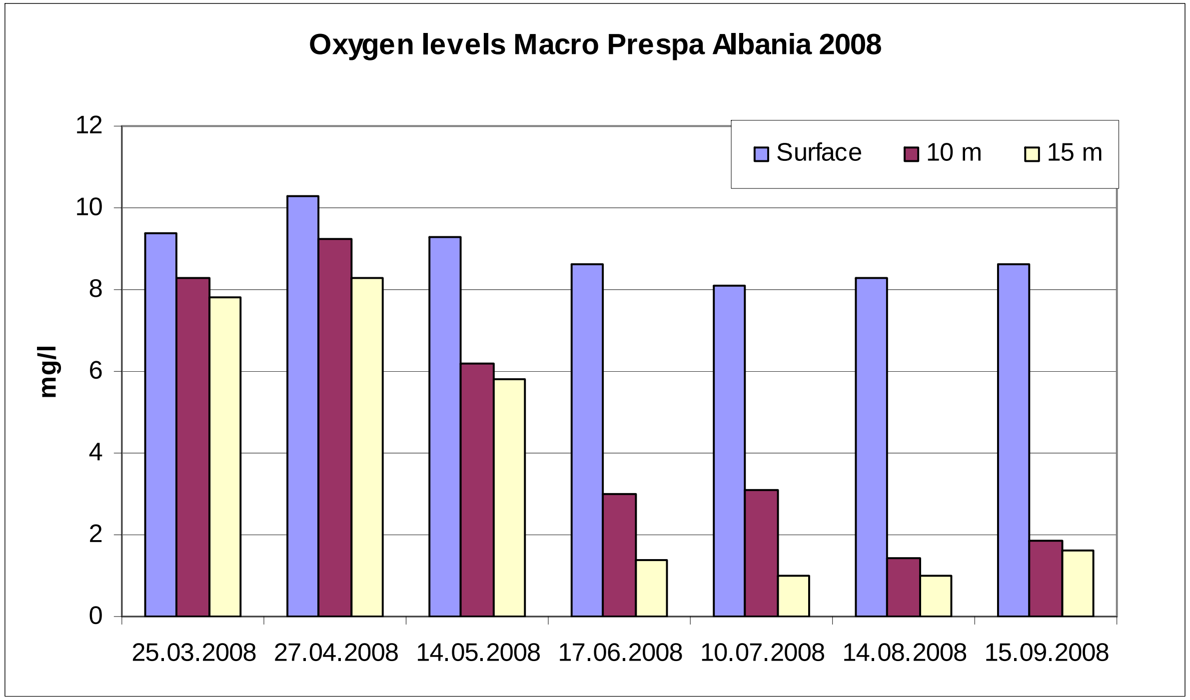


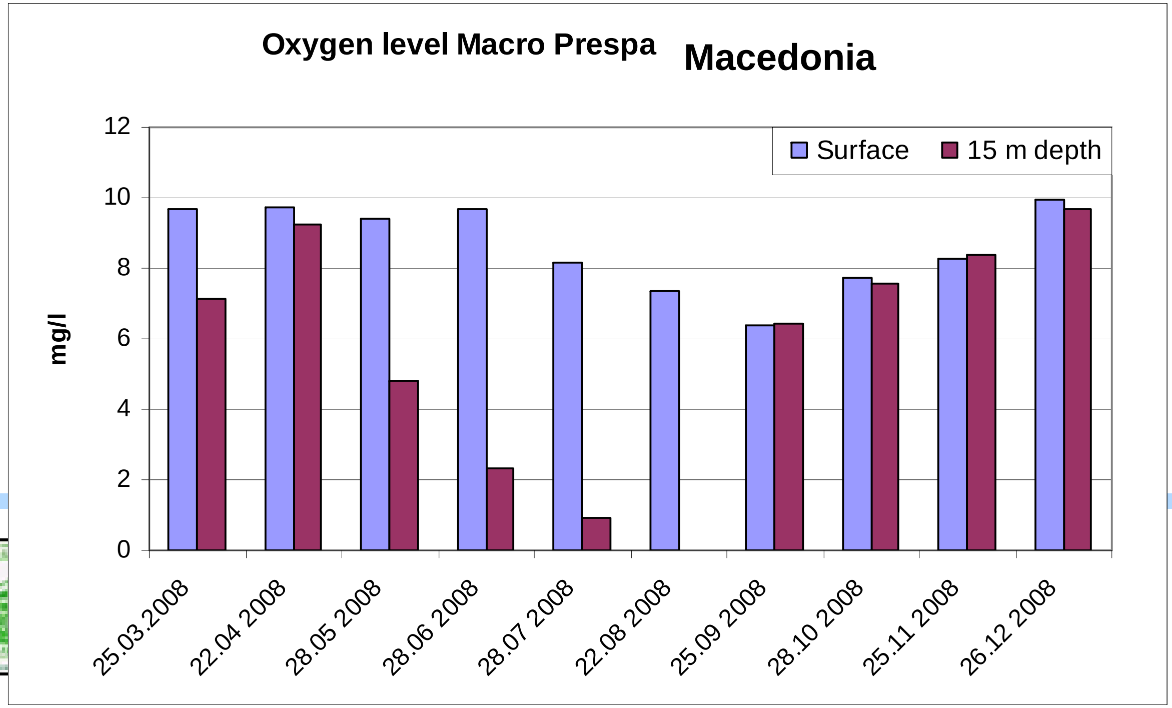
Prespa

Oxygen levels

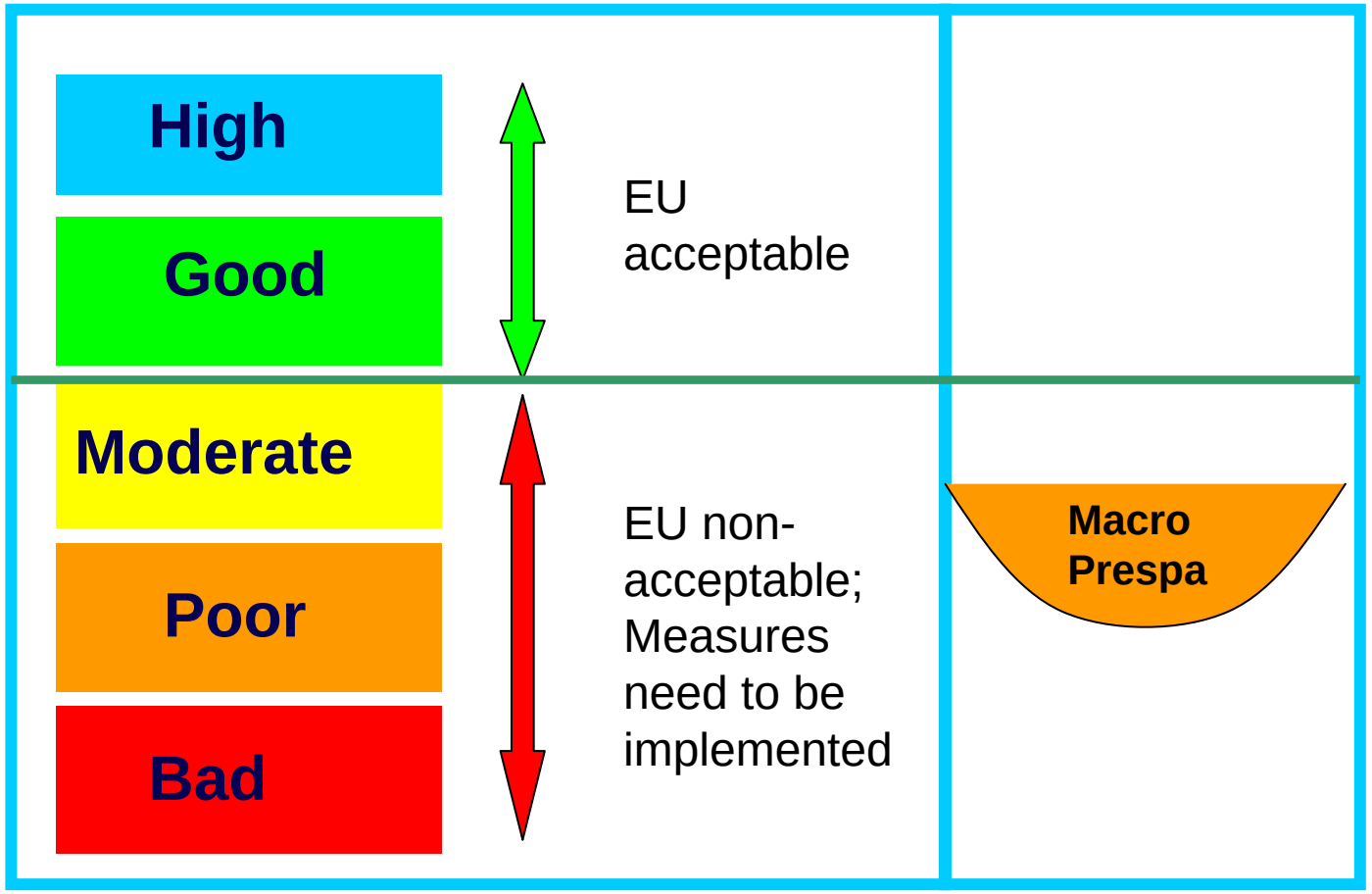
Anoxic at the bottom during the summer in both sites

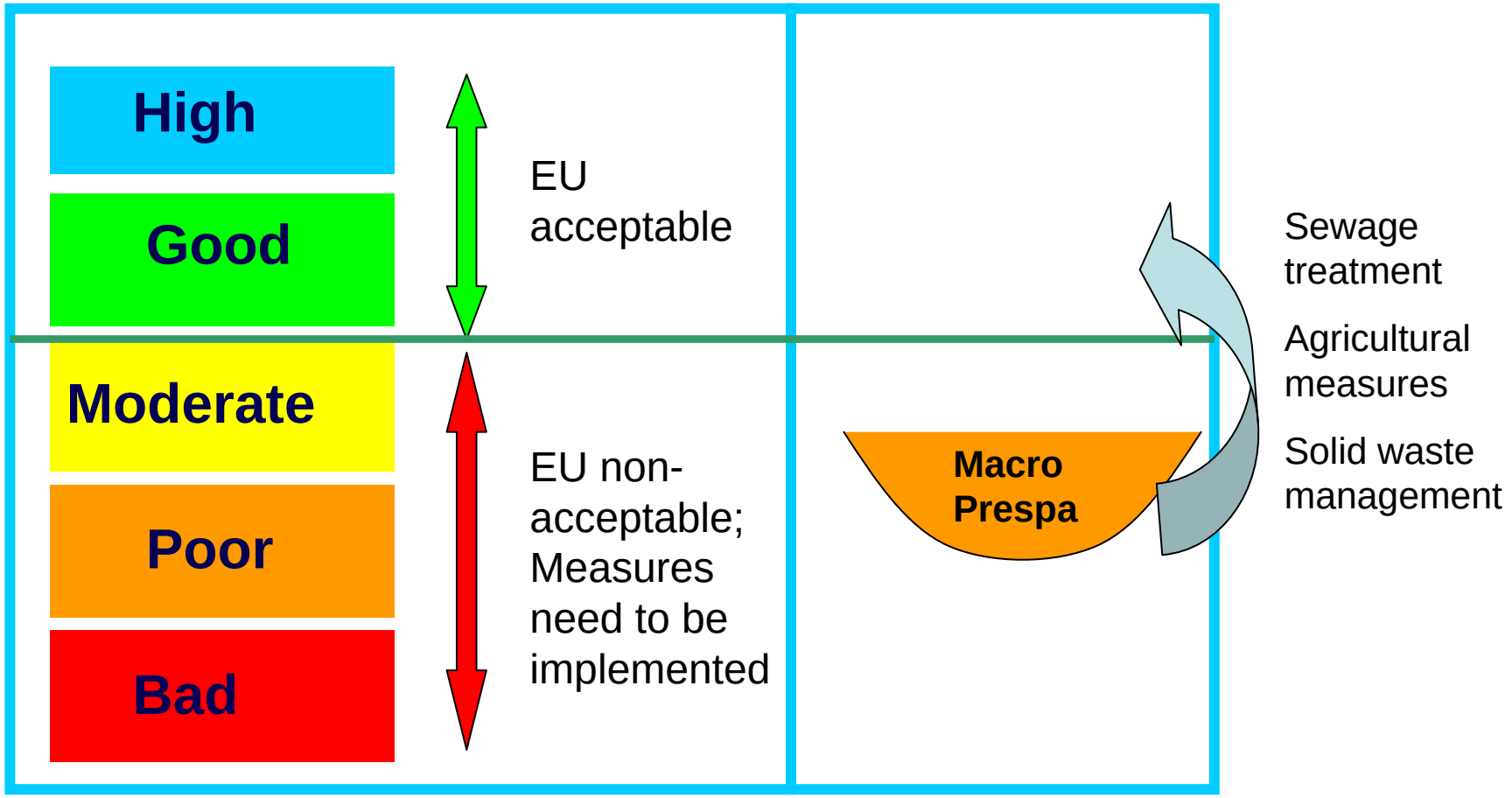
=> in itself a clear indication that mitigation measures are needed





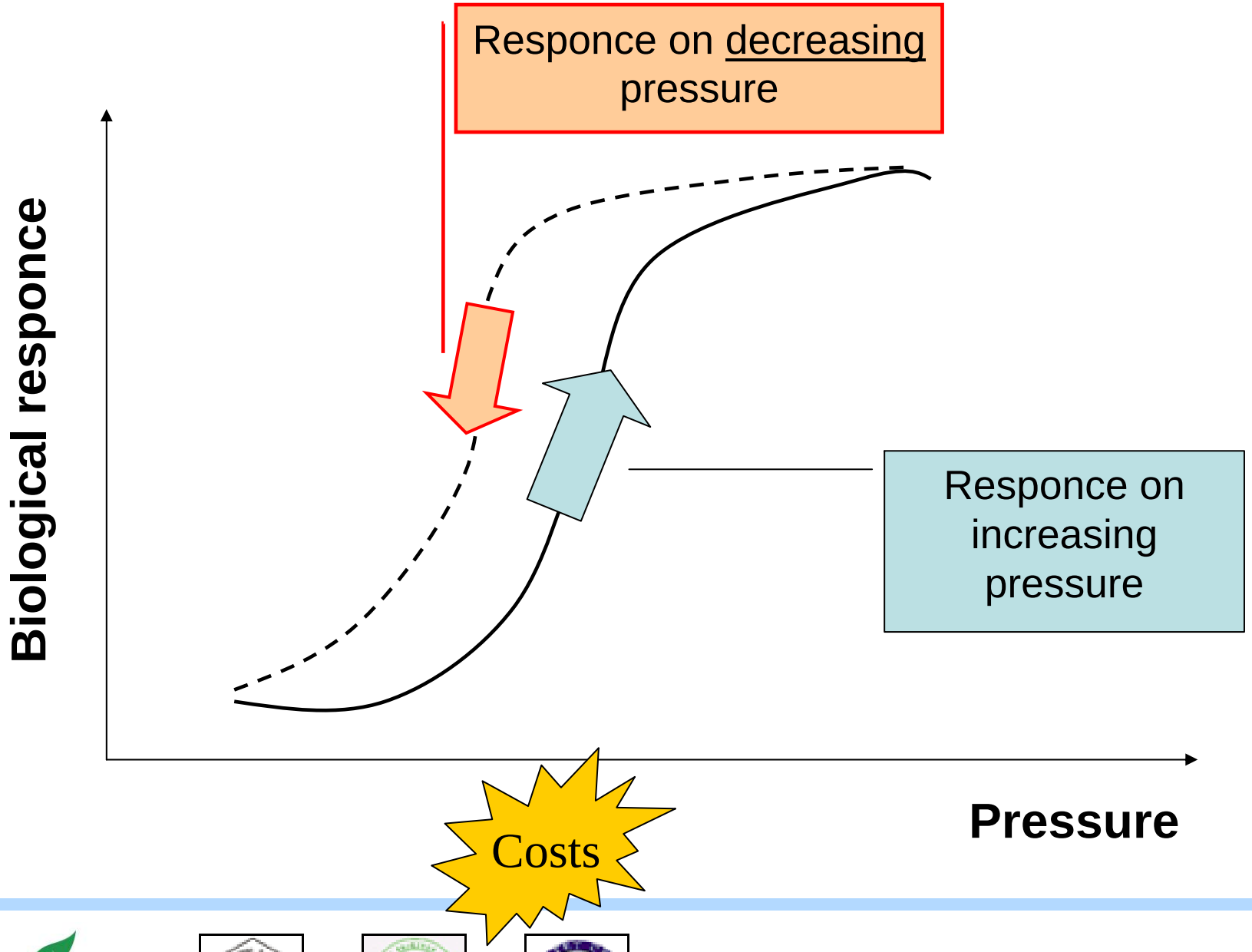
Bioforsk


High
Good
Moderate
Poor
Bad
EU acceptable
EU non-acceptable; Measures need to be implemented
Macro Prespa


High
Good
Moderate
Poor
Bad
EU acceptable
EU non-acceptable; Measures need to be implemented
Macro Prespa
Sewage treatment
Agricultural measures
Solid waste management

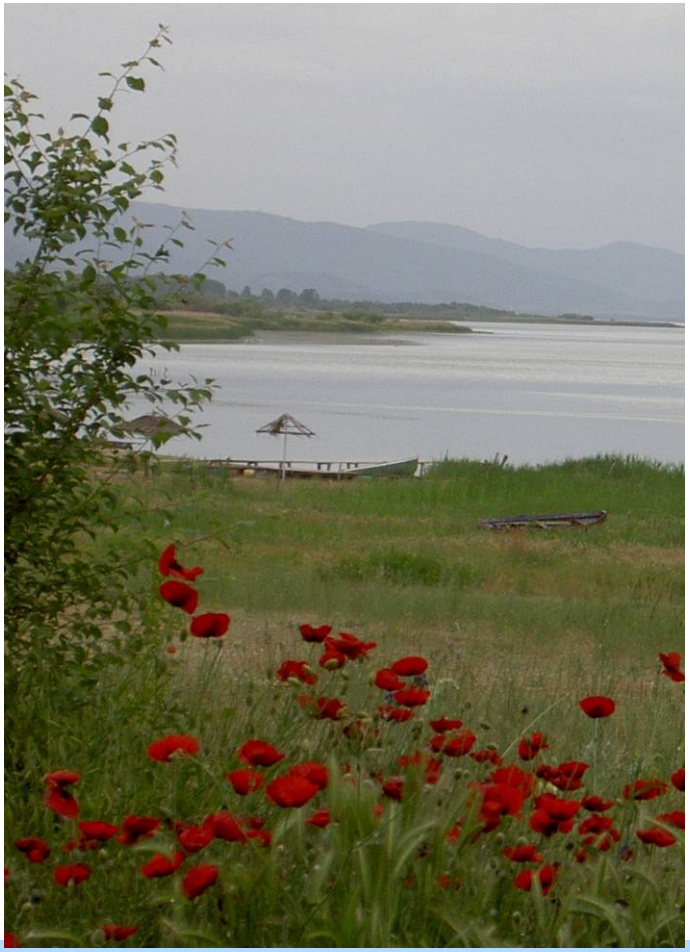

Why is it important to
stop the pollution in time?


Back and forth
are two very different processes!


Responce on decreasing pressure
Biological responce
Responce on increasing pressure
Costs
Pressure

Conclusions and recommendations for both lakes

- **Co-operation between riparian states on transboundary monitoring is highly recommended;**
- **Laboratory intercomparison exercises should be done on a regular basis**
- **Transboundary River Basin Management Plans**



Conclusions and recommendations for both lakes

- **Pay attention to hydrology – the water level and waterflow through the lakes are important factors.**
- **Implement mitigation measures for sewage, solid waste and agricultural runoff!**