



Proposing buffer zones and simple technical solutions for safeguarding river water quality and public health

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Case study: **Erymanthos sub-basin**
Location: Alfeios River Basin
Peloponnisos Peninsula, Greece



SUMMARY

Alfeios River Basin (ARB) constitutes one of the major hydrologic basins of Peloponnisos Peninsula in Southern Greece. It is drained by Alfeios River and its tributaries, such as Lousios, Ladhon, Erymanthos, Kladheos, Selinous, Enipeus, etc. The present study focuses on Erymanthos sub-basin, since Ileia Prefecture is dependent on Erymanthos River for its community water supply. Erymanthos R. is vulnerable to pollution due to pressures provoked by human activities. The basin settlements lack of wastewater treatment and disposal systems. Recognizing the importance of clean water for a healthy community, a developing economy, and a sustainable environment, buffer zones and small technical works could be integrated as cost-effective and health-safeguarding solutions.

SUMMARY INFO

GENERAL DESCRIPTION OF ERYMANTHOS SUB-BASIN

AREA	361.42 Km ²
POPULATION	7,273 inh.
DISCHARGE	10 m ³ /sec (winter)
MEAN ALTITUDE	861 m
MEAN SLOPE	35.3 %
PRECIPITATION	1,200 mm

Aspects of Erymanthos R.
by NGO Erymanthos



AIMS



The goal of this study is to detect areas with high pollution risk and suggest a) the location of suitable buffer zones and b) simple technical works in order to prevent direct polluting discharges into the main channel of Erymanthos R. The above systems could also act supportively in groundwater enrichment, forest protection and soil erosion prevention [1].

APPROACH



In Greece, small communities and rural areas cannot afford the costs of advanced and specialized centralized wastewater systems, which require a trained and qualified staff and increased cost of maintenance, whereas their populations may be too spread out to make this solution a realistic option.

A viable and interesting alternative could be the decentralized natural systems that use relatively more land and require lower energy use and labor costs [2]. Based on previous studies [3], buffer zones are proposed in order to overcome the problem of contaminating water supply in the catchment that lacks of wastewater treatment and disposal systems.

Erymanthos Mt

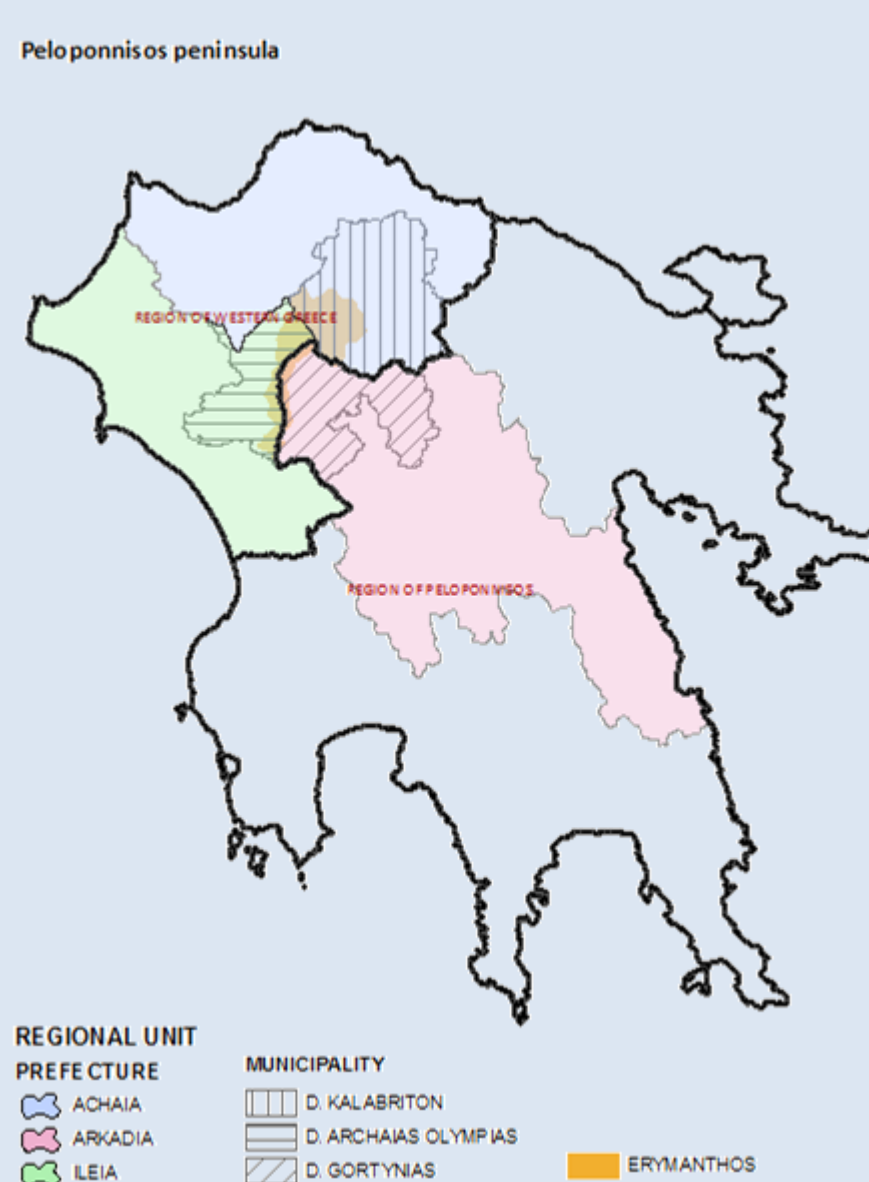
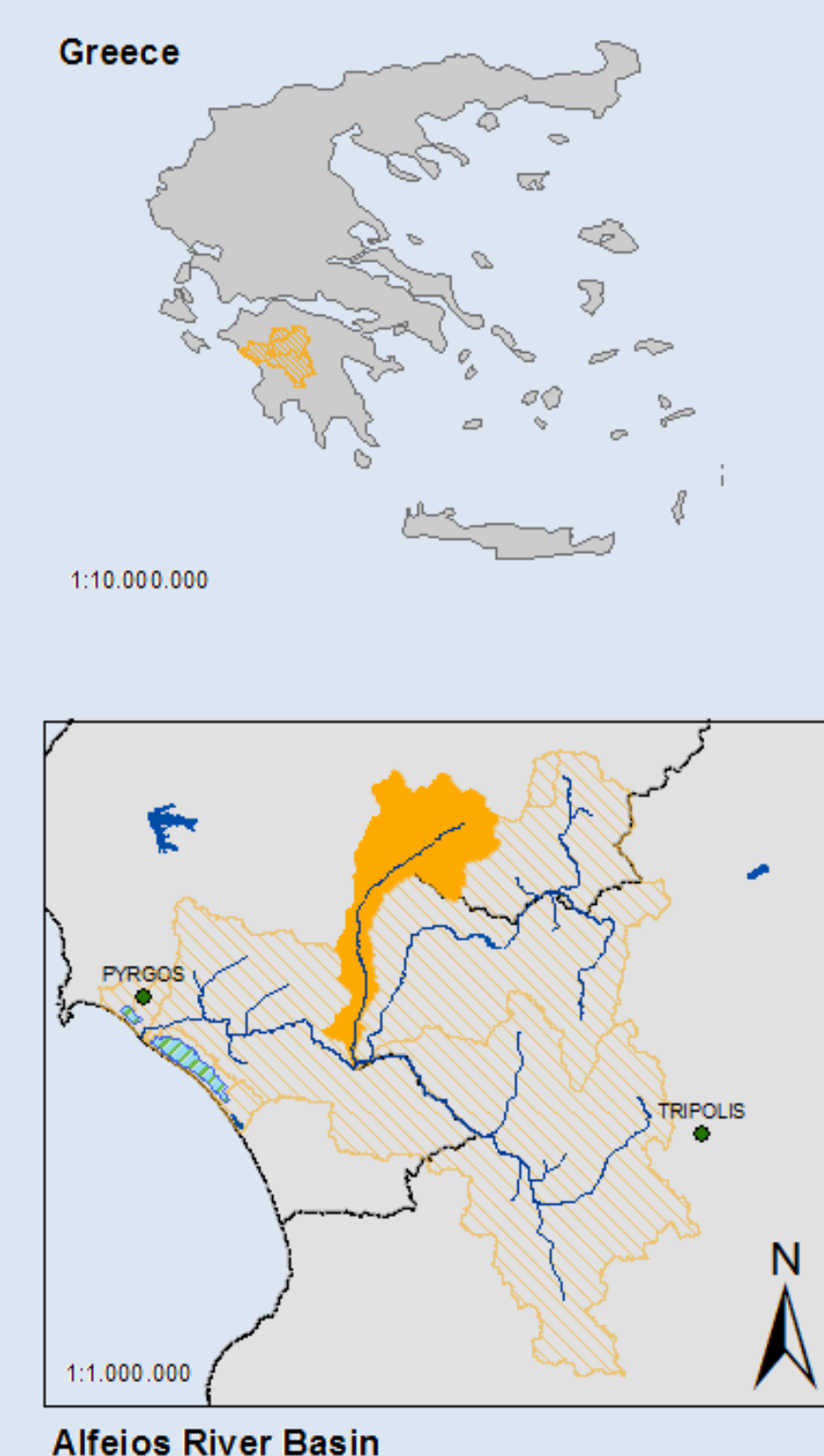


(L) Mougila peak 2100m
(R) Olenos peak 2224m
by S. Kalogeropoulos

Tsapournia's waterfalls



Rafting in Erymanthos R.



ADMINISTRATIVE REFORM OF ERYMANTHOS SUB-BASIN

- 1 DECENTRALIZED ADMINISTRATION OF PELOPONNISOS, WESTERN GREECE & IONIAN ISLANDS
- 2 REGIONS
- 3 REGIONAL UNITIES
- 3 MUNICIPALITIES
- 28 MUNICIPAL APARTMENTS

Water uses

The water supply project for Ileia Prefecture from Erymanthos R. (started on May 2011) covers the needs of 51,600 people. It includes a central piping network of 107 km, a water treatment refinery and storage tanks.



Domestic



Irrigational



Livestock



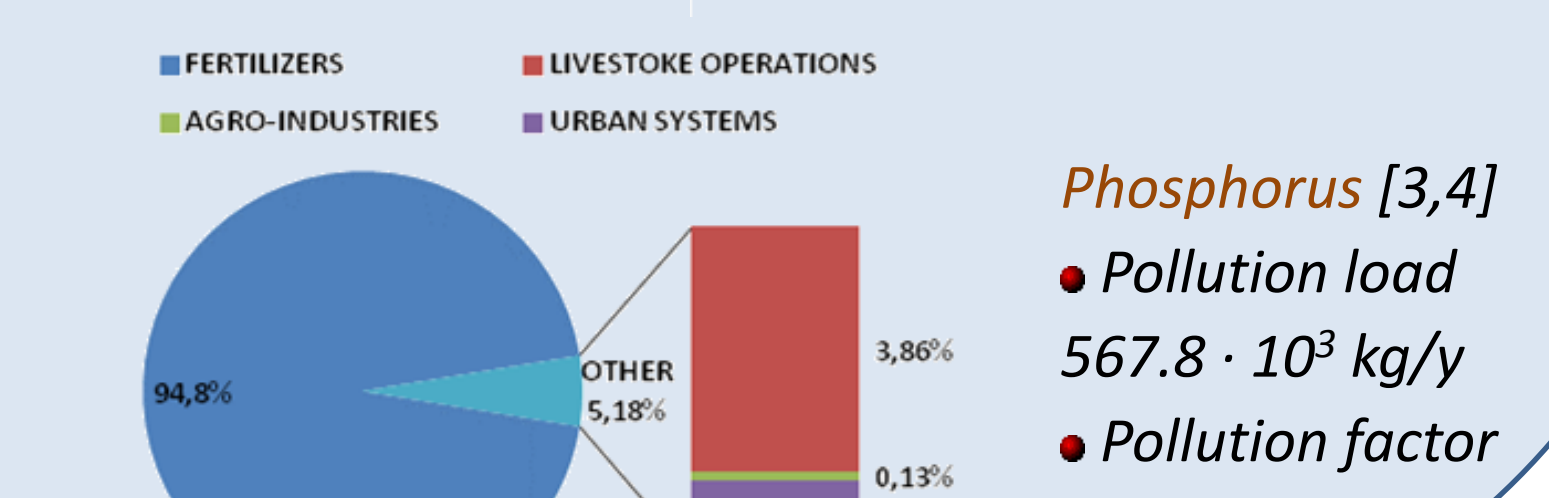
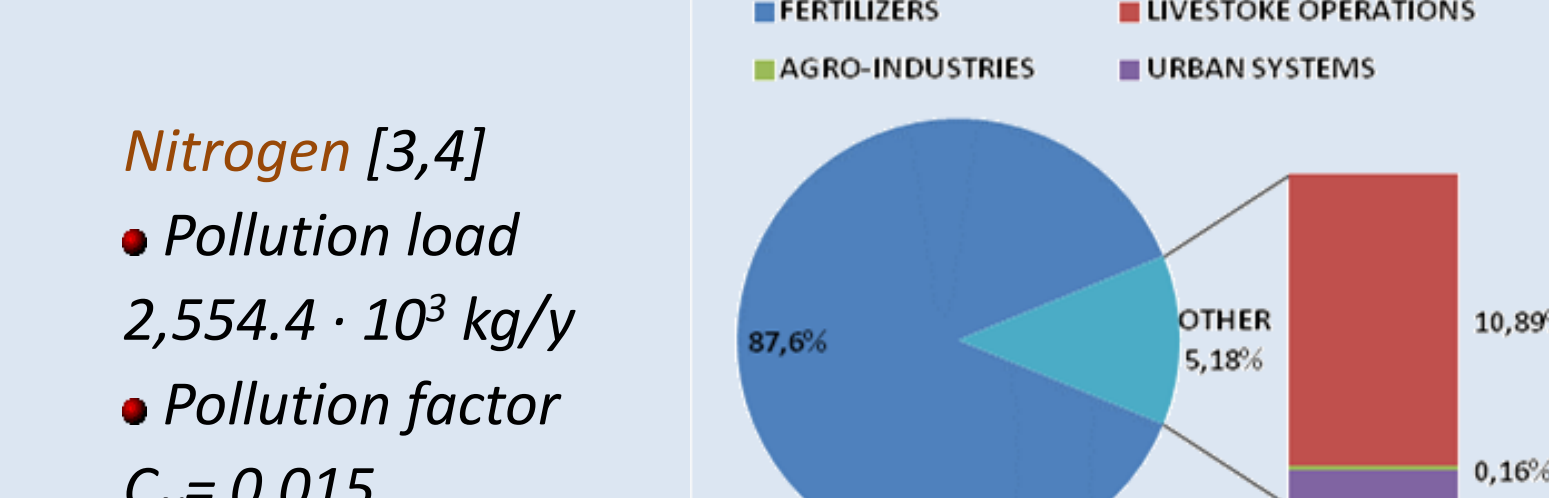
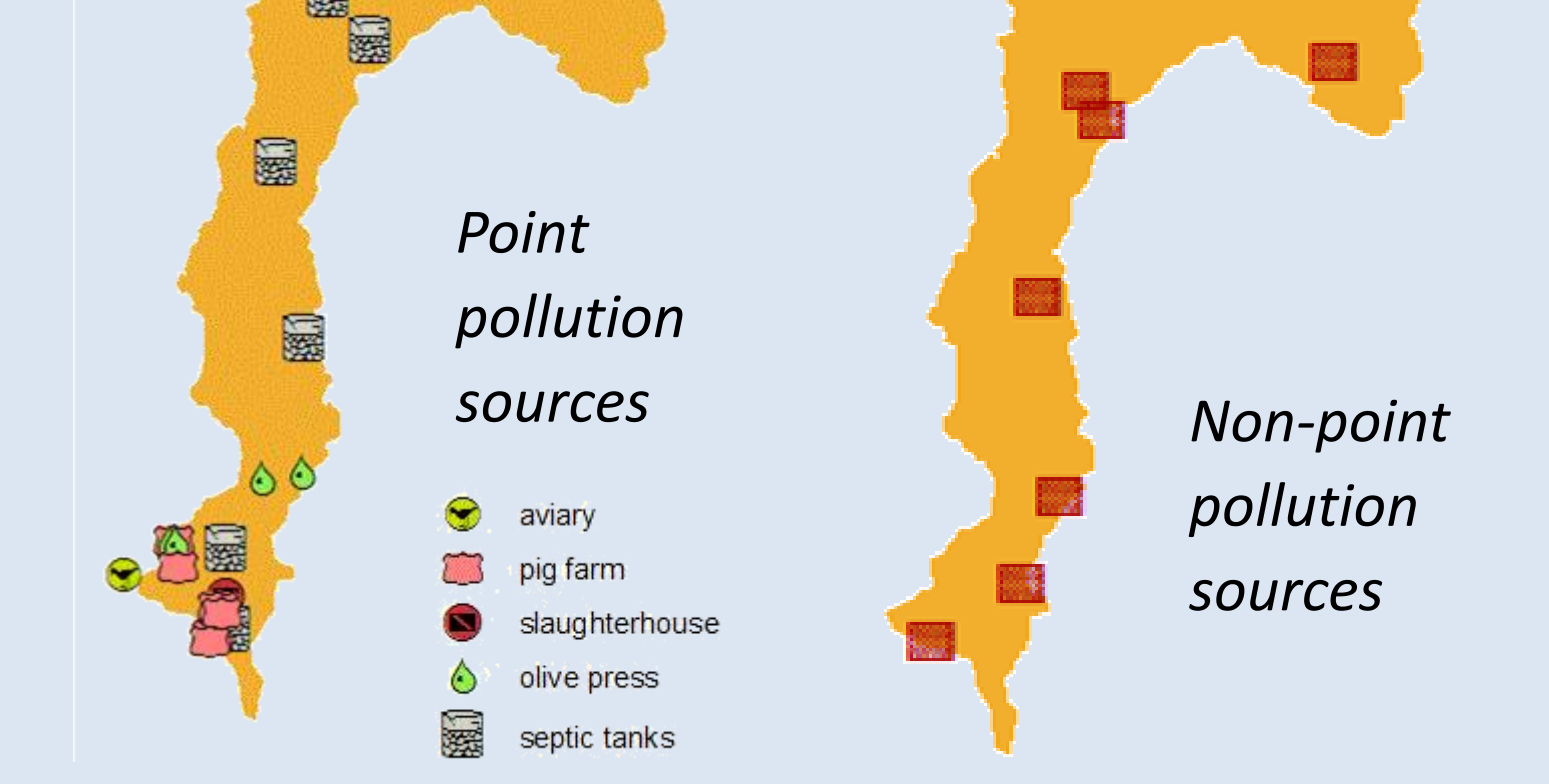
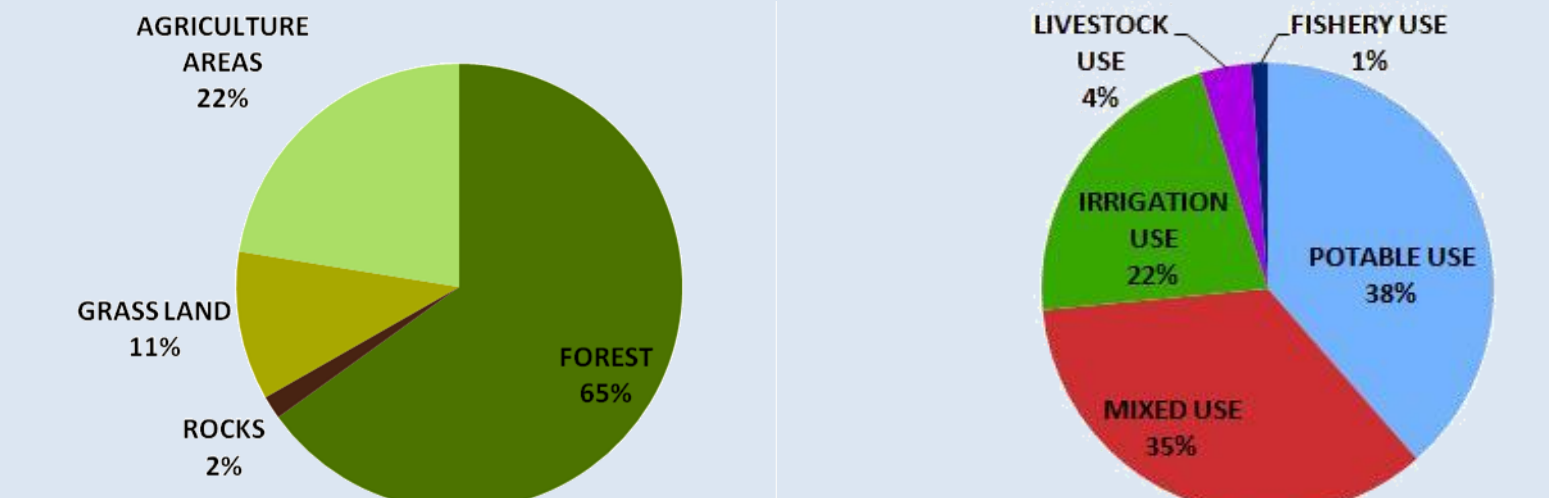
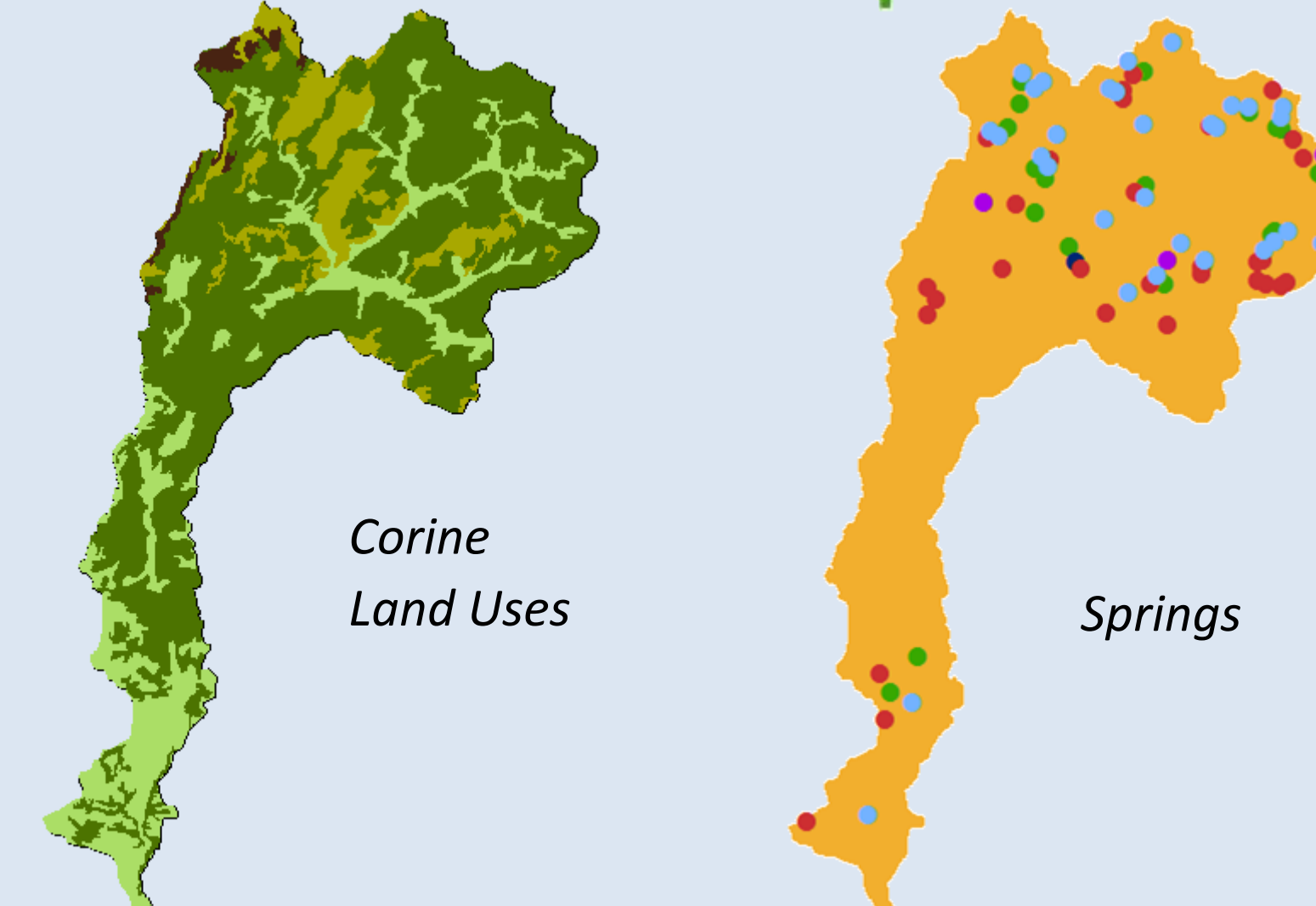
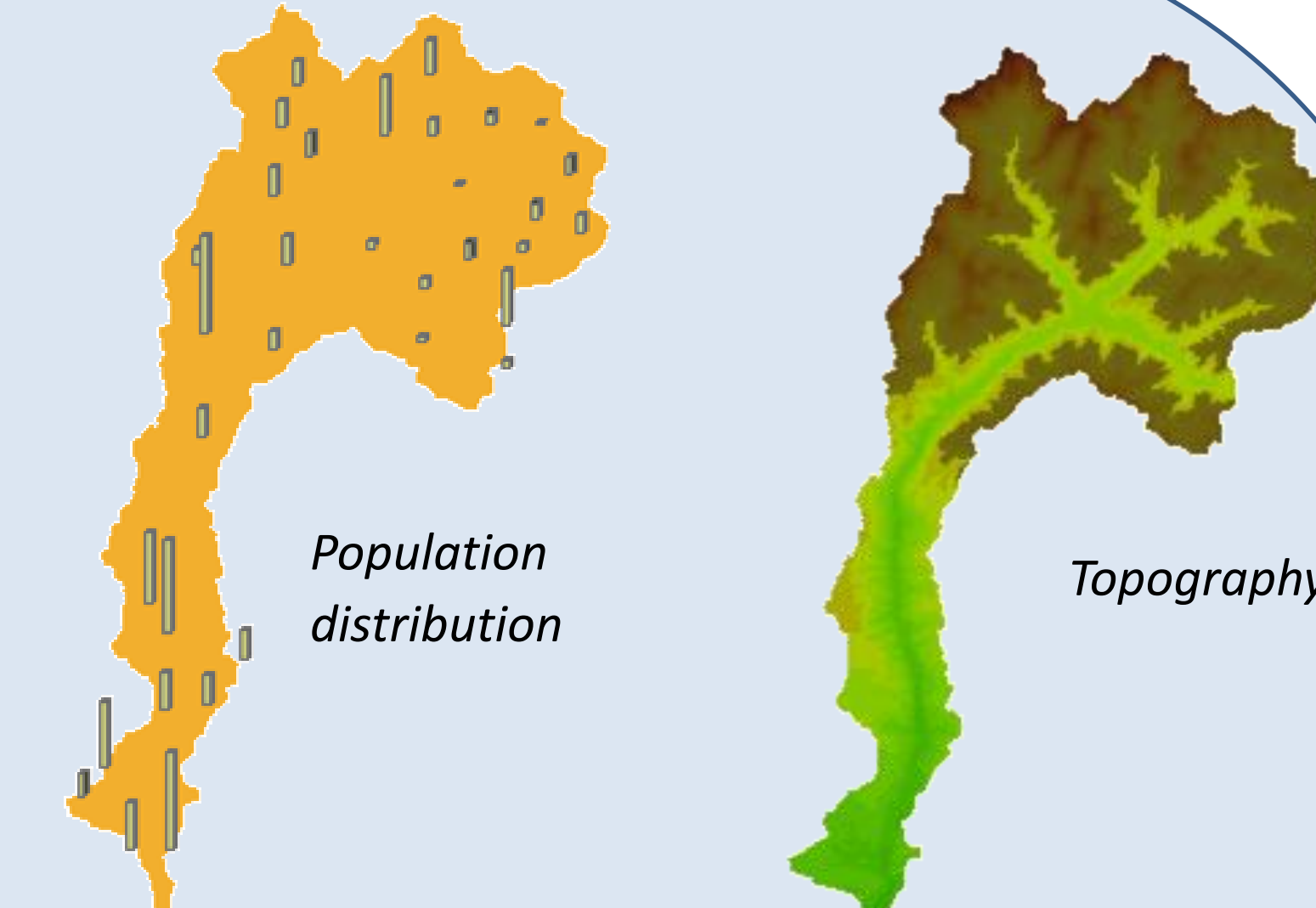
Aquaculture



Agro-industrial



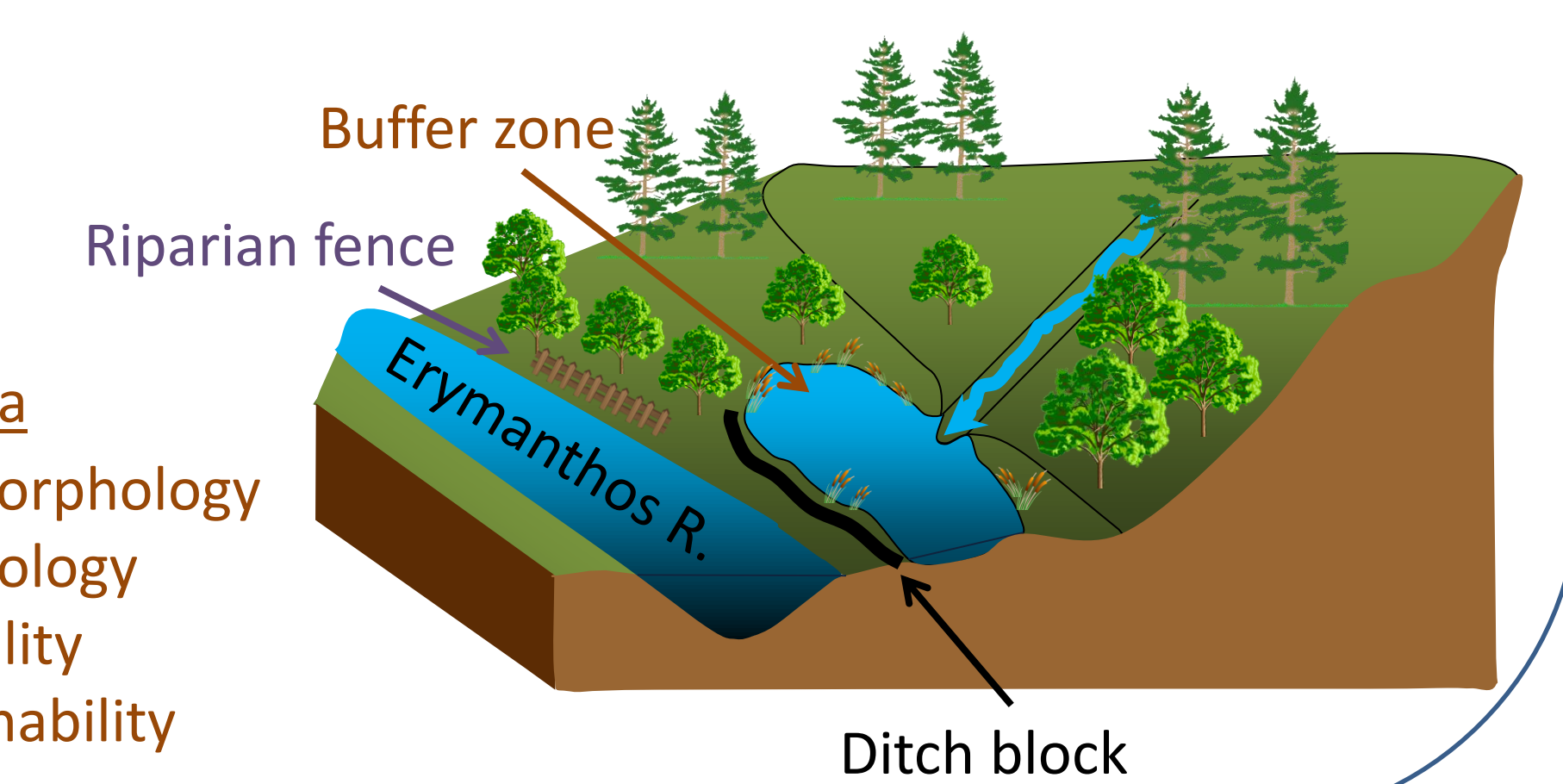
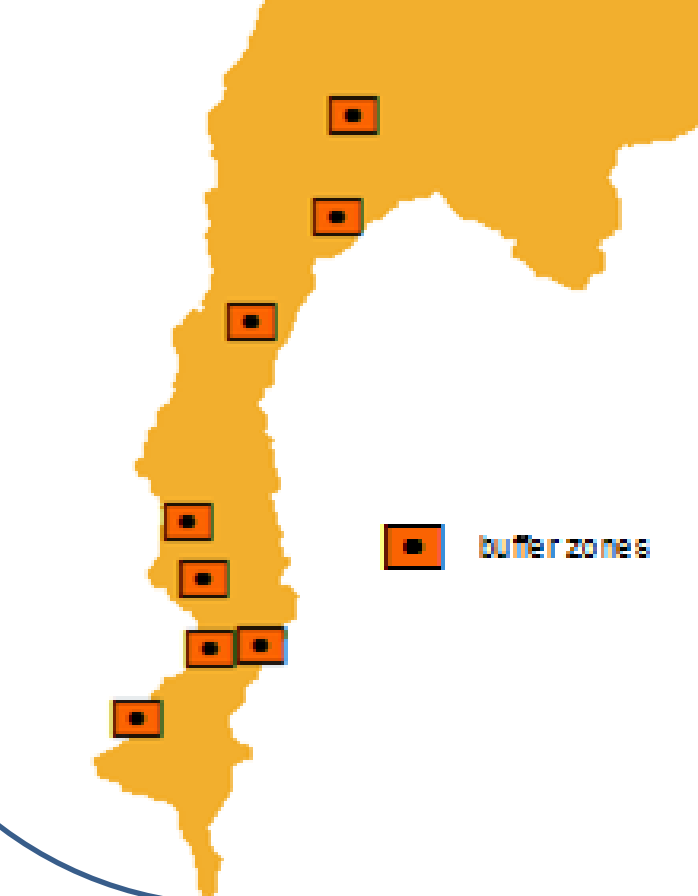
Recreational



FINDINGS AND MEASURES

Riparian buffer zones are intended to delay run-off and prevent direct movement of nutrients and other pollution factors into the surface water. Buffer zones are formed after constructing small-case ditch blocks. The preferred size of a buffer zone is variable, depending on each case. The real size of a buffer zone is often the result of negotiations between the various stakeholders and depends on the availability of land. It is therefore crucial that all stakeholders are fully involved in defining the buffer zone area [1].

Riparian fencing (constructing fence along streams to limit or eliminate the access of sheep or other livestock to waterways) is an alternative / supplementary option.



Criteria

- ✓ geomorphology
- ✓ technology
- ✓ feasibility
- ✓ sustainability

CONCLUSIONS



This study suggests:

- a) suitable buffer zones in areas with high pollution risk, and
- b) simple technical works in order to prevent the main channel of Erymanthos R. from direct polluting discharges. Authors believe that the results of the study could assist authorities and engineers to design and develop strategies of improving river water quality and safeguarding public health. The proposed measures may be applicable to other catchments, as well.

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Macroglossum stellatarum



Crocus sieberi



Erymanthos R.



Erymanthos area

