

***IMPLEMENTATION OF ARTICLES  
5 & 6 OF THE EU WATER  
FRAMEWORK DIRECTIVE 2000/60/EC -  
THE PERSPECTIVE FROM A SEMI-ARID  
MEDITERRANEAN ISLAND***

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# OUTLINE

- Water Framework Directive 2000/60/EC
- Implementation in Cyprus
- Articles 5 & 6 are implemented in a small Mediterranean island (Cyprus)
- Problems faced by small semi-arid Mediterranean islands on implementing the WFD
- CONCLUSIONS

# ACKNOWLEDGEMENTS

- Reports prepared by the Consortium consisting of :
  - WL | Delft Hydraulics,
  - ENVECO S.A. and
  - D. Argyropoulos & associates
  
- information through various Government Departments, institutes, and experts on Cyprus

# THE WATER FRAMEWORK DIRECTIVE

## 2000/60/EC AND CYPRUS

- All MS are obliged to protect, restore and upgrade ALL their water systems.
- Achieve "good condition" by 2015
- Develop management plan on river basin level
- It counterbalances
  - interests of environment
  - with the interests of what depends from it
- requires development policies on pricing of water and ensures that the polluter pays.
- Details on web

# Application of the directive in Cyprus.

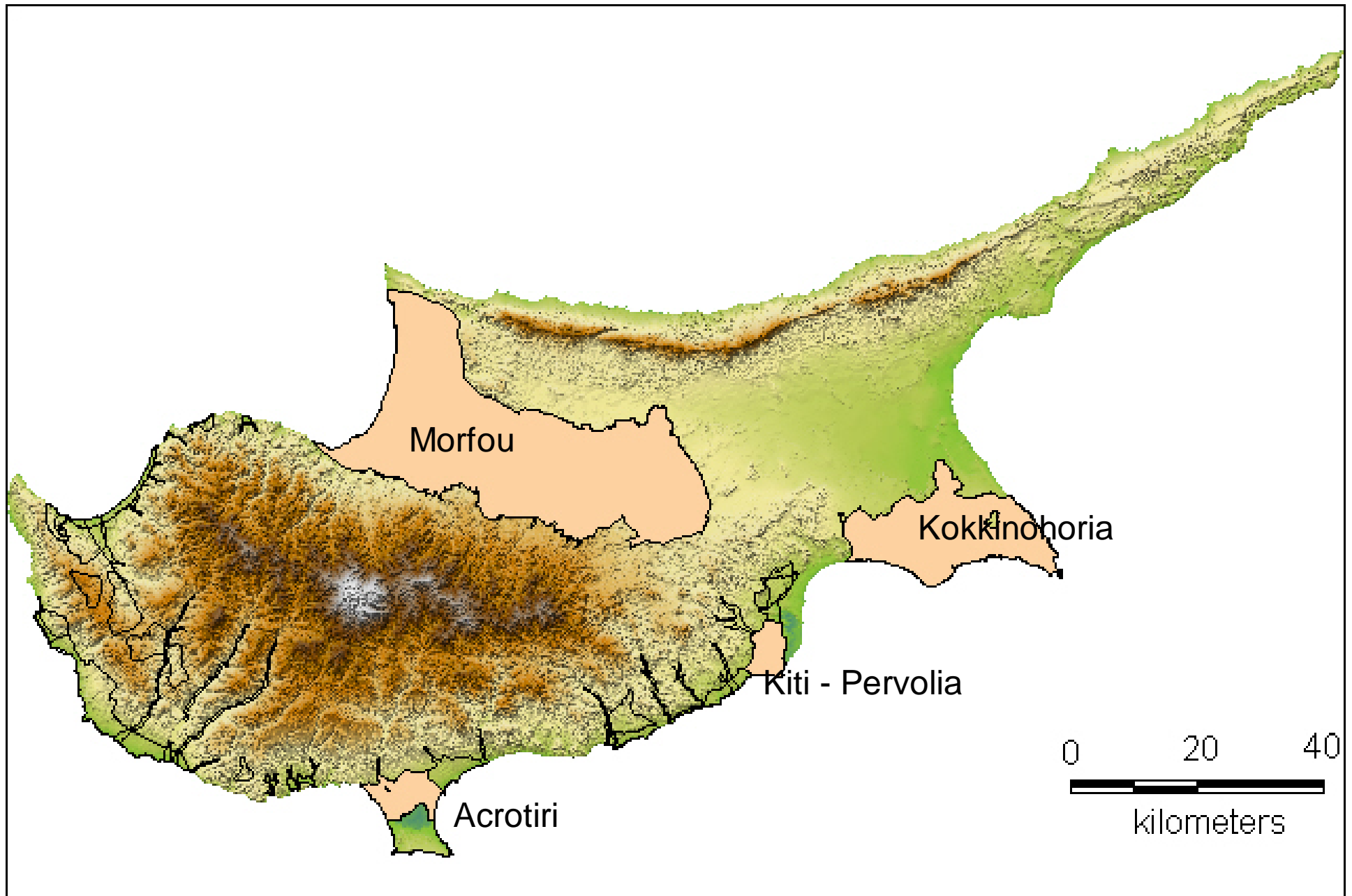
- **ARTICLE 3**

- entire island of Cyprus constitutes one river basin district

- the Minister of Agriculture, Natural Resources and Environment. The “Responsible Authority”

**According to the provisions of Article 1 of Protocol No. 10 on Cyprus, attached to the Treaty of Accession to the EU, the application of the acquis is suspended in those areas of the Republic of Cyprus in which the Government of the Republic of Cyprus does not exercise effective control.**

- **ARTICLES 5 & 6**



**Cyprus shaded relief map depicting the four most important aquifers.**

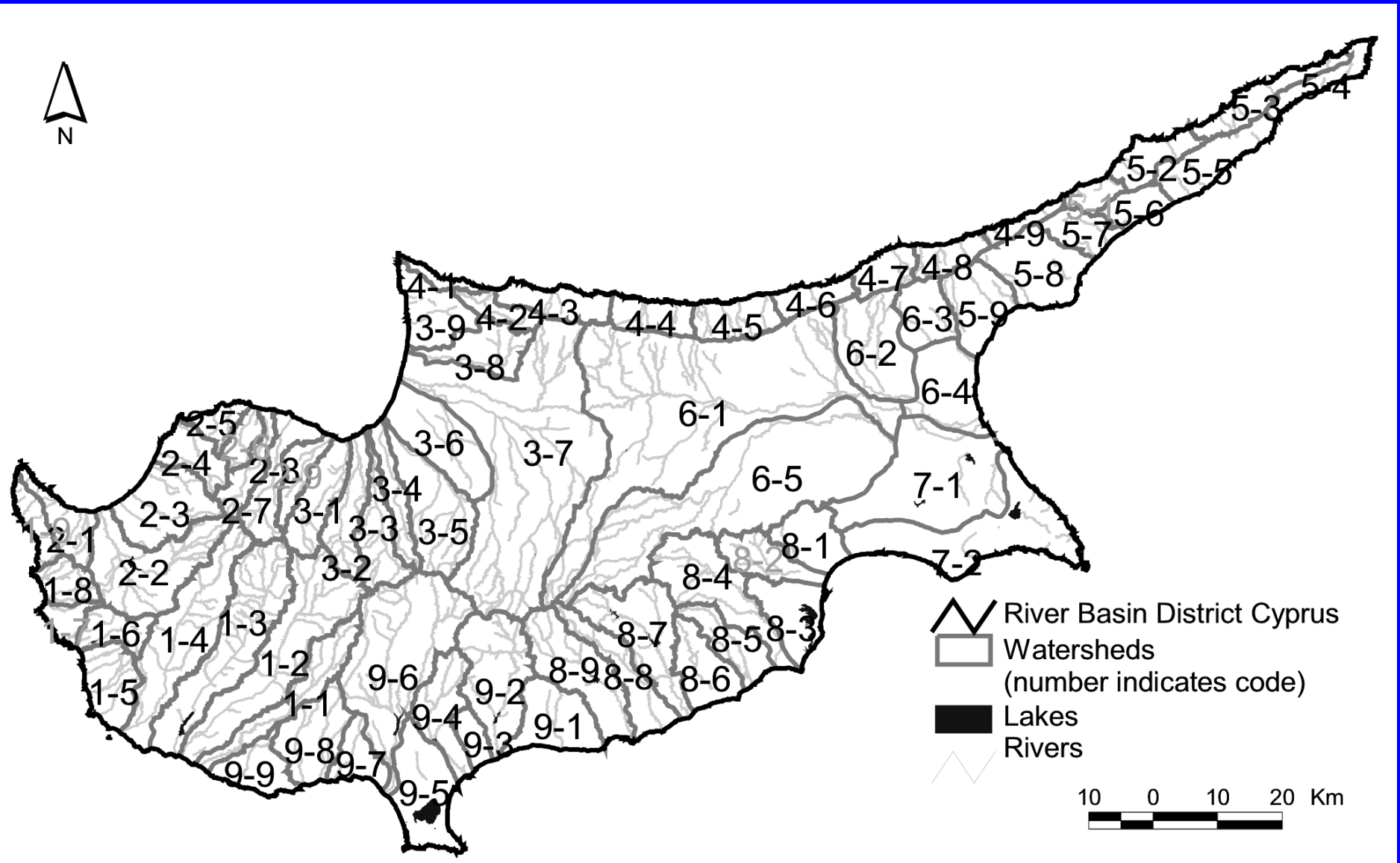
- **ARTICLE 5**

- identification of water bodies
- analysis of pressures and impacts and a review of impact of human activities on the status of surface waters and groundwater
- economic analysis

- **ARTICLE 6**

- register of protected areas

# IMPLEMENTATION OF ARTICLE 5 IN CYPRUS

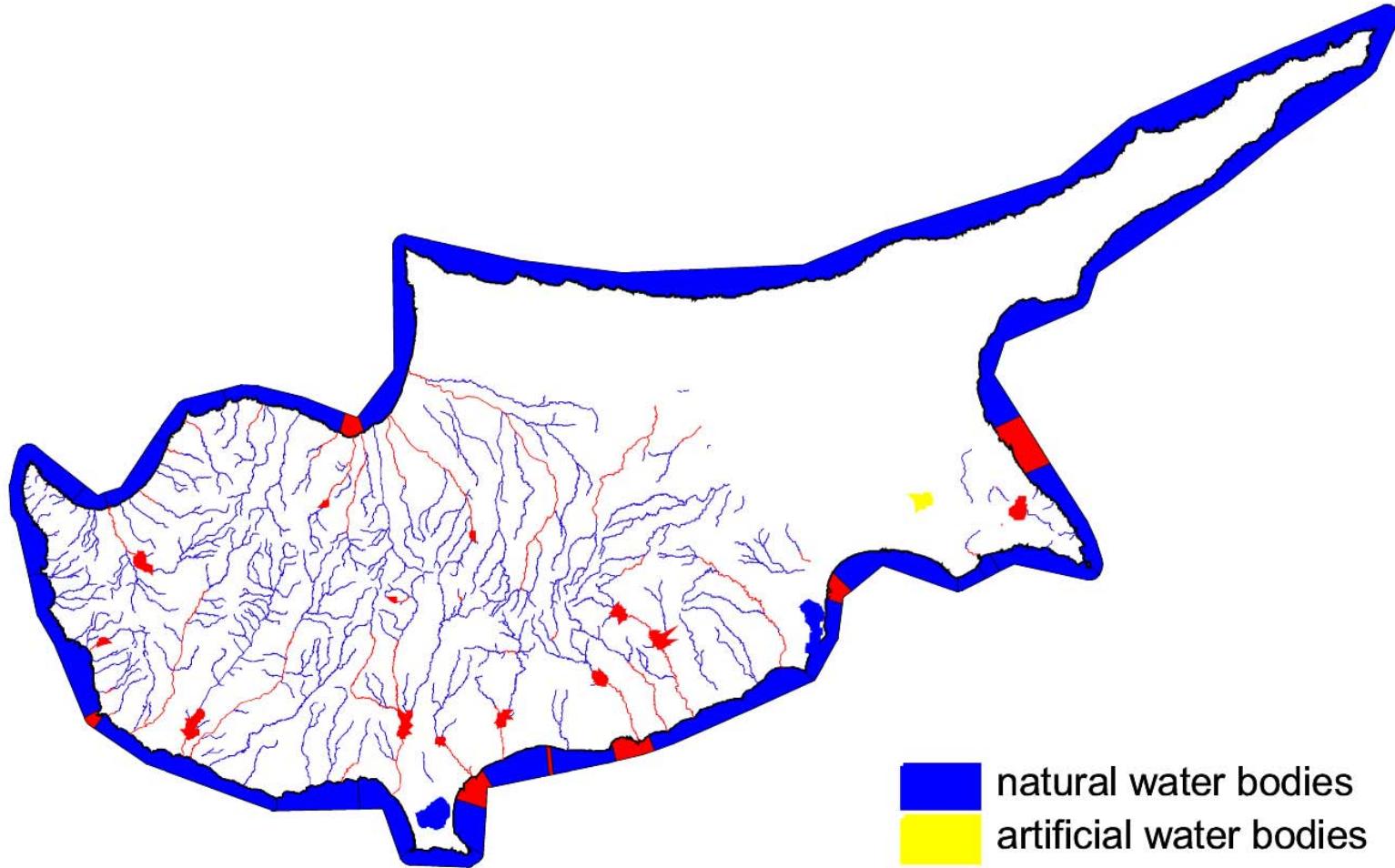





River basin district of Cyprus with its watersheds, rivers and lakes.



# Characterization & typology

- no rivers with perennial flow



-  natural water bodies
-  artificial water bodies
-  heavily modified water bodies

10 0 10 20 Km  


## Ecology

– hydrologic conditions in the discharge regime:

- continuous or non-continuous flow, is the most important characteristic.
- Descriptors like geology and altitude there is no evidence that influence ecology in Cyprus

## Typology of the river water bodies

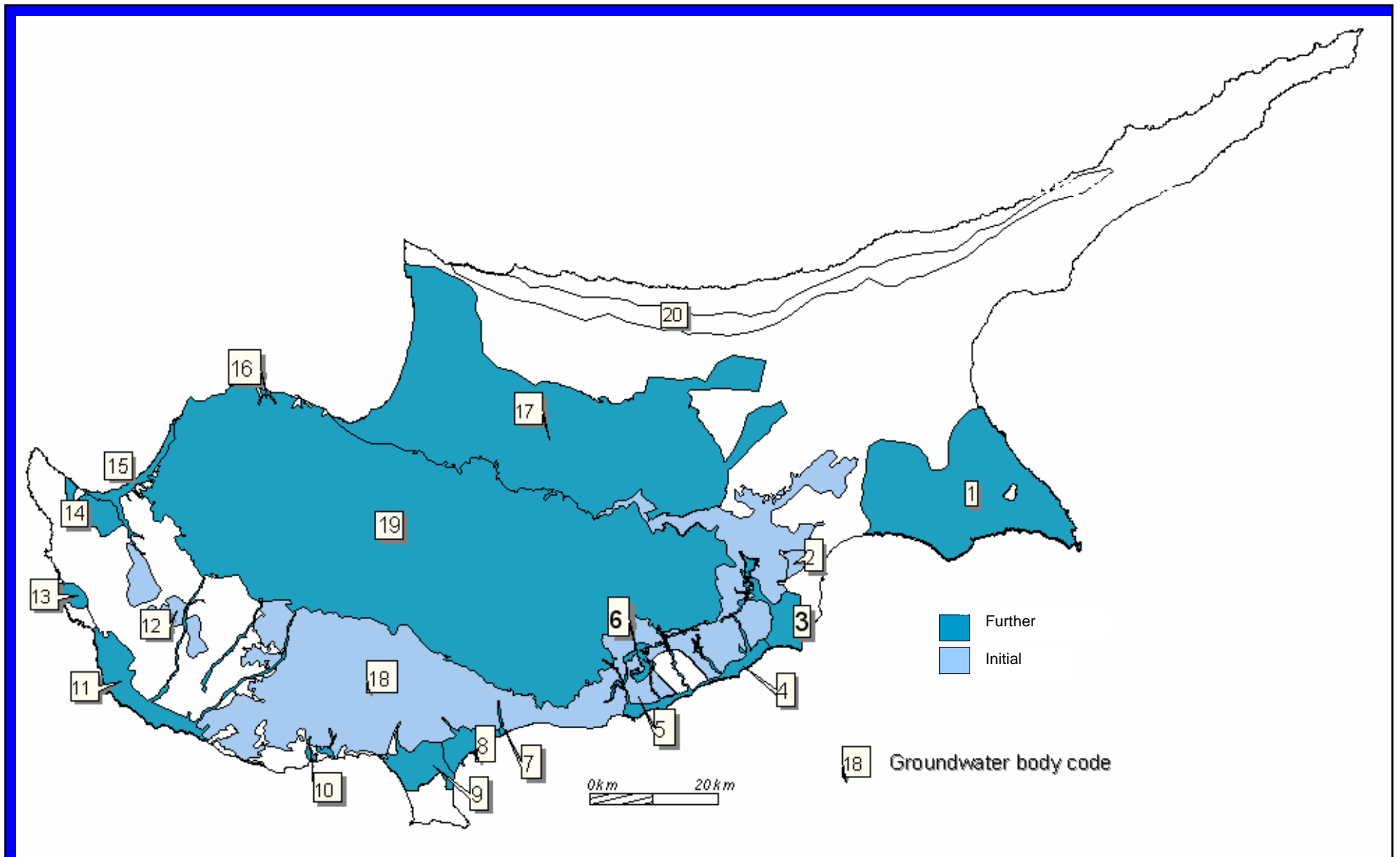
- descriptors ‘catchment size’, ‘precipitation’ and ‘flow continuity’

## Typology of Lakes

- Descriptors: The salt content, water depth, connection to a river and the size

## Typology of Coastal Waters

- mean substrate composition, wave exposure and depth.
- Tidal range and salinity - considered irrelevant



## Groundwater bodies of Cyprus and their characterization status

- they receive strong pressures
- direct sewage disposal excessive use of fertilizers - Nitrate pollution

# Pressures and impacts

Pressures related to agricultural activities, either in the form of cultivation of land or livestock breeding, shows the areas with increased loads of nitrogen and phosphorous are in the eastern part of Cyprus

- **point source pollution**

- solid wastes uncontrolled or in some cases semi-controlled
- dumping of municipal solid wastes in more than 80 sites
- various mines (9)
- Urban waste water
- Storm water
- Aquaculture
- Groundwater abstraction. 18 of the 19 groundwater bodies, significant abstractions - considered 'over-pumped'.

# Pressures and impacts (2)

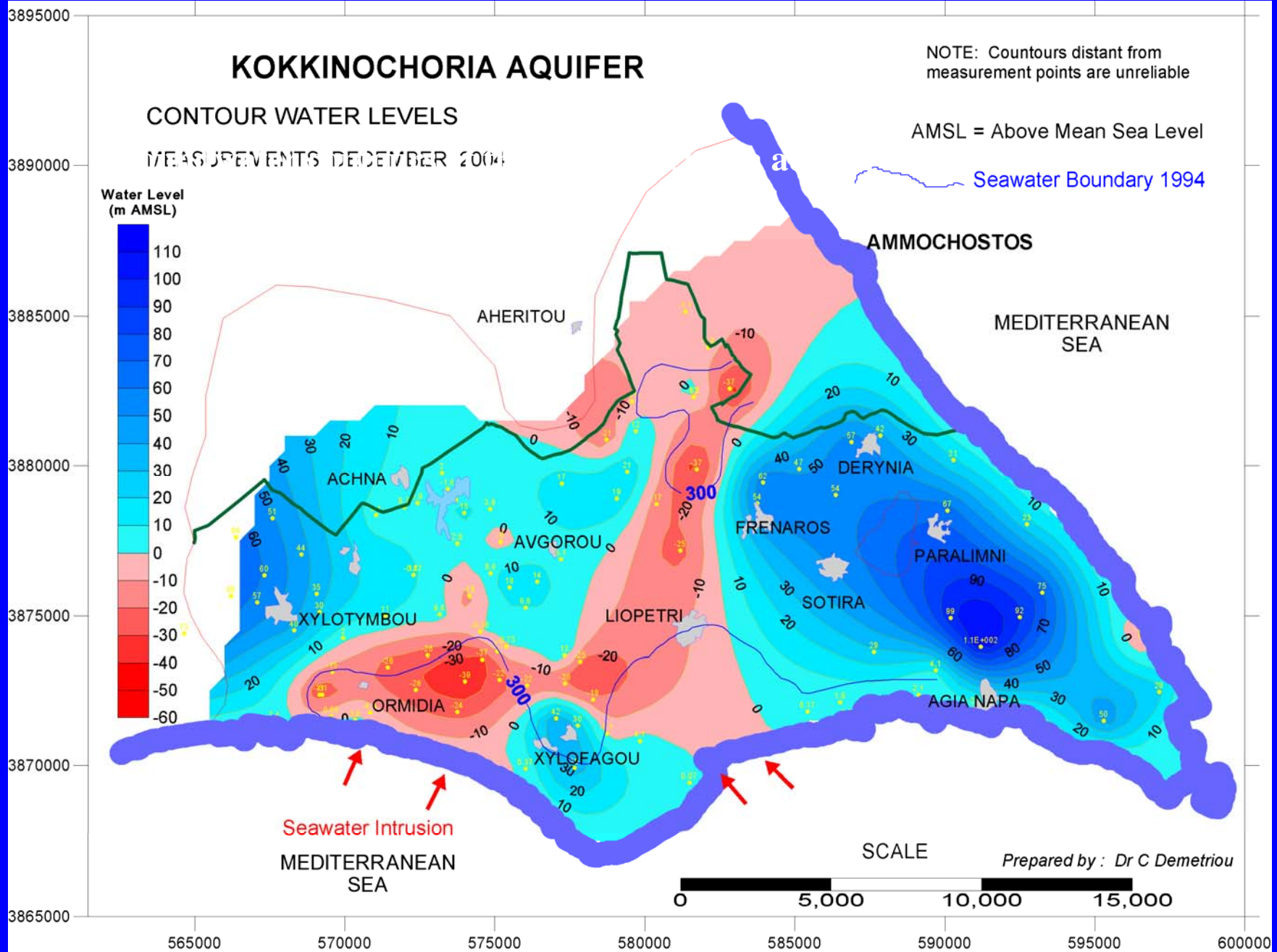
## diffuse source pollution

- ● Urban waste water;
  - lack of sewerage collection systems, septic tanks and cesspools
- ● Storm water runoff;
  - from precipitation mainly on impervious areas
- ● Agriculture & land use;
  - enrichment of surface waters and groundwater with nutrients (nitrogen and phosphorus)
- ● Livestock.
  - application of a mechanical separator of wastes - application of the solids to the land

## **Water bodies at risk (of failing the Directive)**

Water body is classified as being at risk:

- **Nutrient loads and eutrophication.**
  - analysis of pressures from agricultural activities such as land cultivation and livestock breeding
- **Oxygen demand and microbial pollution.**
  - (point source) pressures from urbanised areas with high populations and breeding of livestock at farms located close to surface water bodies.
- **Toxic substances.**
  - pressures from industrial activities, and also industrial waste waters, uncontrolled dumping sites (landfills) mines and storm water discharges
- **Other (influence of mines and major landfills).**



**Groundwater contours at the Kokkinochoria aquifer on December 2004.**



# Economic analysis

Cost recovery (CR) of water services is analysed for different users, by considering storage and main transportation, distribution, sewage collection, wastewater treatment, and the environmental and resource cost.

The water services analysed are:

- • Freshwater provision to domestic uses (households, industry and tourism) and irrigation through the Government Water Works, administered by the Water Development Department of the Ministry of Agriculture, Natural Resources and the Environment of Cyprus.
- • Urban waste water collection and treatment by the Sewerage Boards of Lemesos-Amathous, Pafos, Ayia Napa and Paralimni and Larnaka.
- • Recycled water supply to irrigation through the Government Water Works.

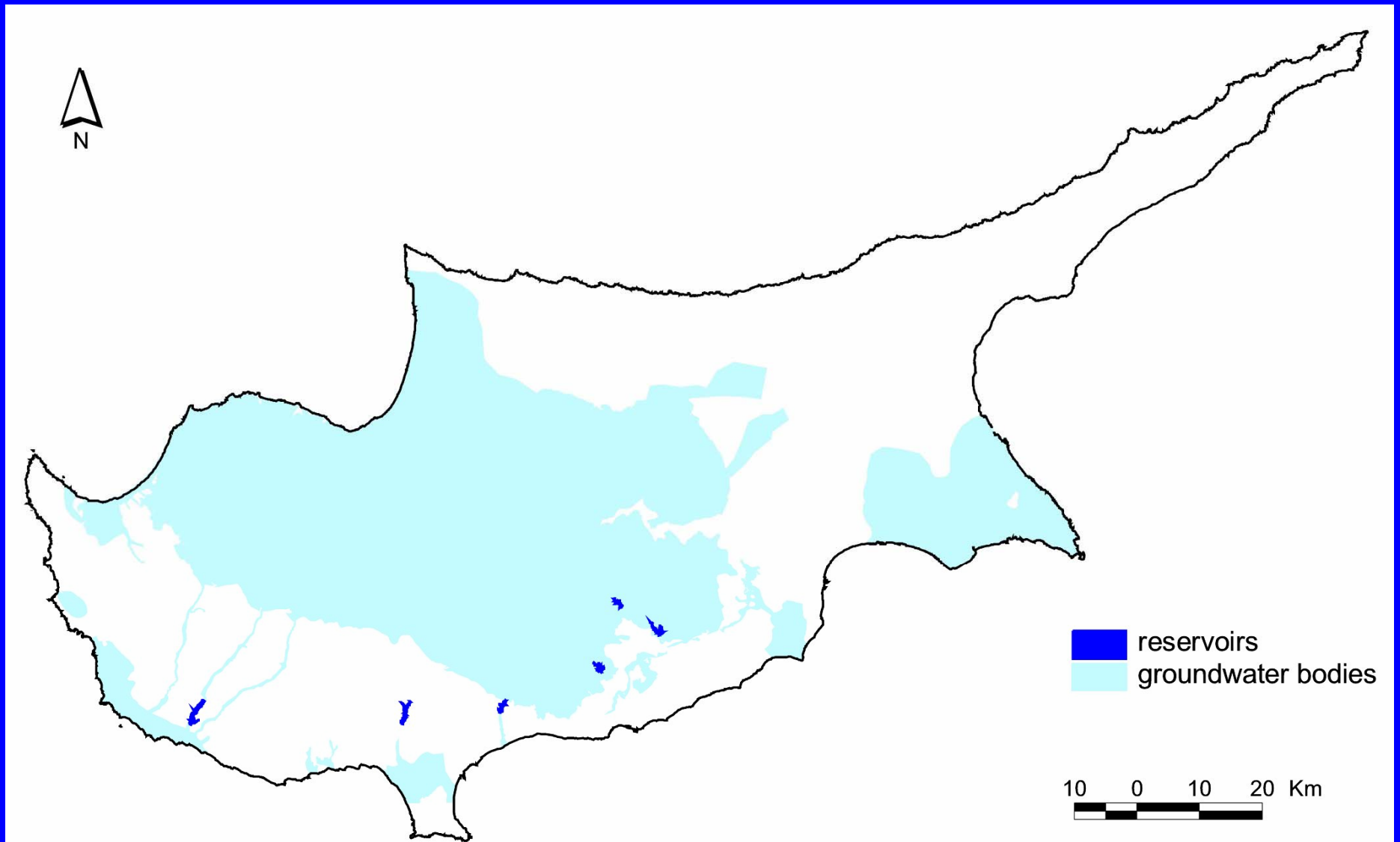
## Economic analysis (2)

significant water management issues :

- regulation of groundwater abstractions and promotion of artificial recharge,
- the allocation of resources between domestic use and agriculture,
- the excessive application of fertilizers and pesticides.

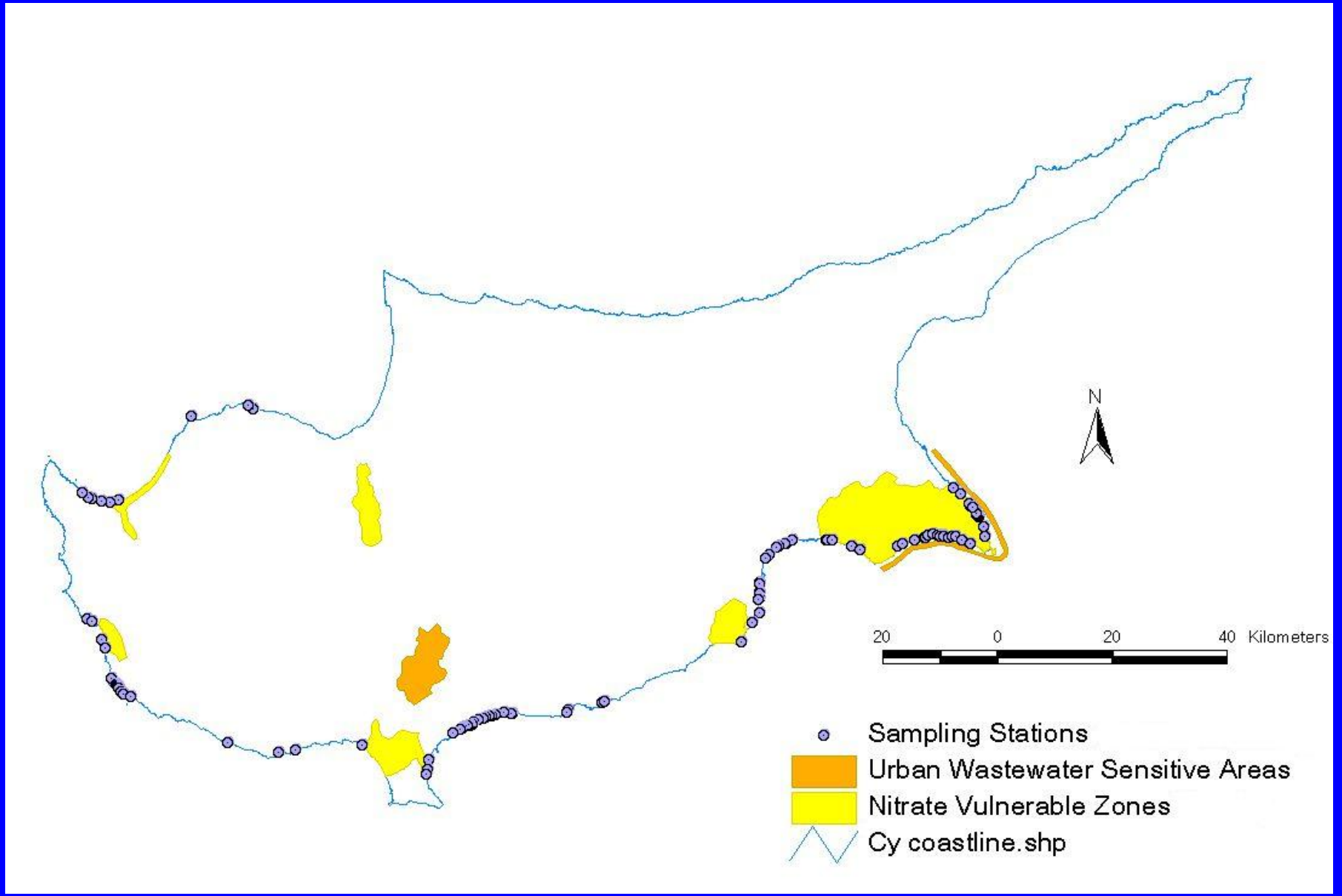
The purpose of the analysis was to create an appropriate background for the future establishment of a programme of measures for the river basin district of Cyprus, taking into consideration the initial characterisation of the district, through the identification of pressures and impacts and the economic analysis of the water uses performed.

# IMPLEMENTATION OF ARTICLE 6 IN CYPRUS (1)



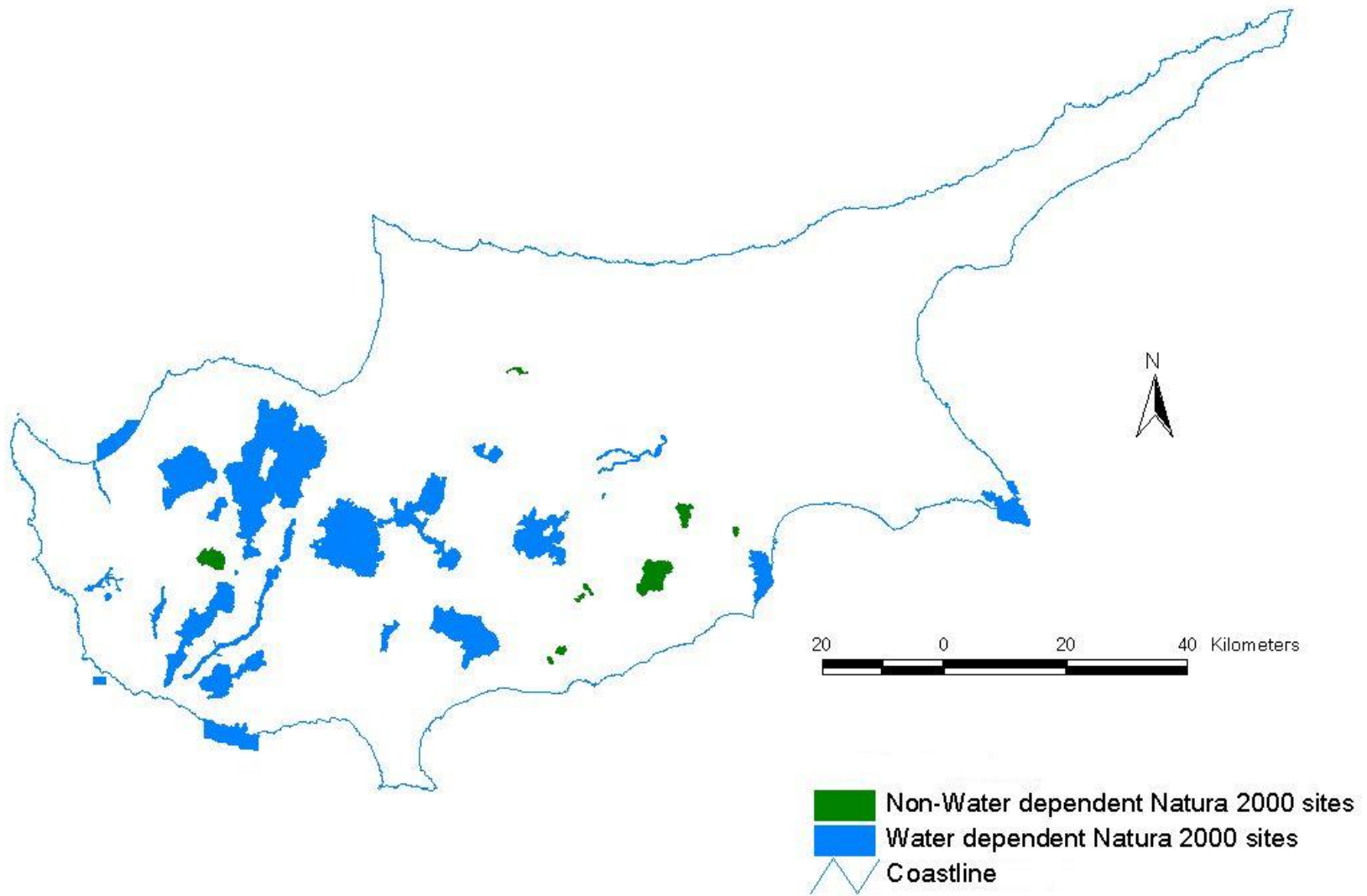
Water bodies related to human consumption

# IMPLEMENTATION OF ARTICLE 6 IN CYPRUS (2)



Sampling stations for bathing waters and nutrient sensitive areas

# IMPLEMENTATION OF ARTICLE 6 IN CYPRUS (3)



Natura 2000 areas that directly depend on water

# CONCLUSIONS

Many problems are encountered on the implementation of Articles 5 & 6 :

- The lack of an integrated rationally organised national network for data collection.
- Much of the information collected over the years is still in paper form.
- The lack of water quality data, especially chemical analysis information other than ionic.
- The difficulty on co-ordination between the responsible authorities and all the involved institutions.

## CONCLUSIONS (2)

- The lack on specialised expertise and suitable human potential.
- The mentality of users of water.
- The high cost of implementation.
- Difficulties associated with the extended periods of low rainfalls observed in Cyprus in the last decades.
- Difficulties arising from the fact that the Directive is more focused on the big river basins of Europe.