

# Calcium

Calcium salts and calcium ions are among the most commonly occurring in nature. They may result from the leaching of soil and other natural sources or may come from man-made sources such as sewage and some industrial wastes. Calcium is usually one of the most important contributors to hardness. Human body requires approximately 0.7 to 2.0 grams of calcium per day as a food element, excessive amounts can lead to the formation of kidney or gallbladder stones. High concentrations of calcium can also be detrimental to some industrial processes. Thus, both domestic and industrial water users have to consider calcium concentrations. Calcium (Ca) is the major mineral causing hardness in water. When groundwater saturated with dissolved carbon dioxide is pumped to the surface, any subsequent rise in temperature and/or reduction in pressure causes degassing of carbon dioxide and precipitation (settling) of calcium salts forming encrustation deposits.

## **Effects on Environment and Human Health**

Calcium also serves an important role in the health of bodies of water. In natural water it is known to reduce the toxicity of many chemical compounds on fish and other aquatic life.

## **Remedial measures**

In case of higher amount of calcium, it can be removed by reverse osmosis or deionization methods. These techniques will remove the entire calcium content, which may affect human health due to lack of calcium.

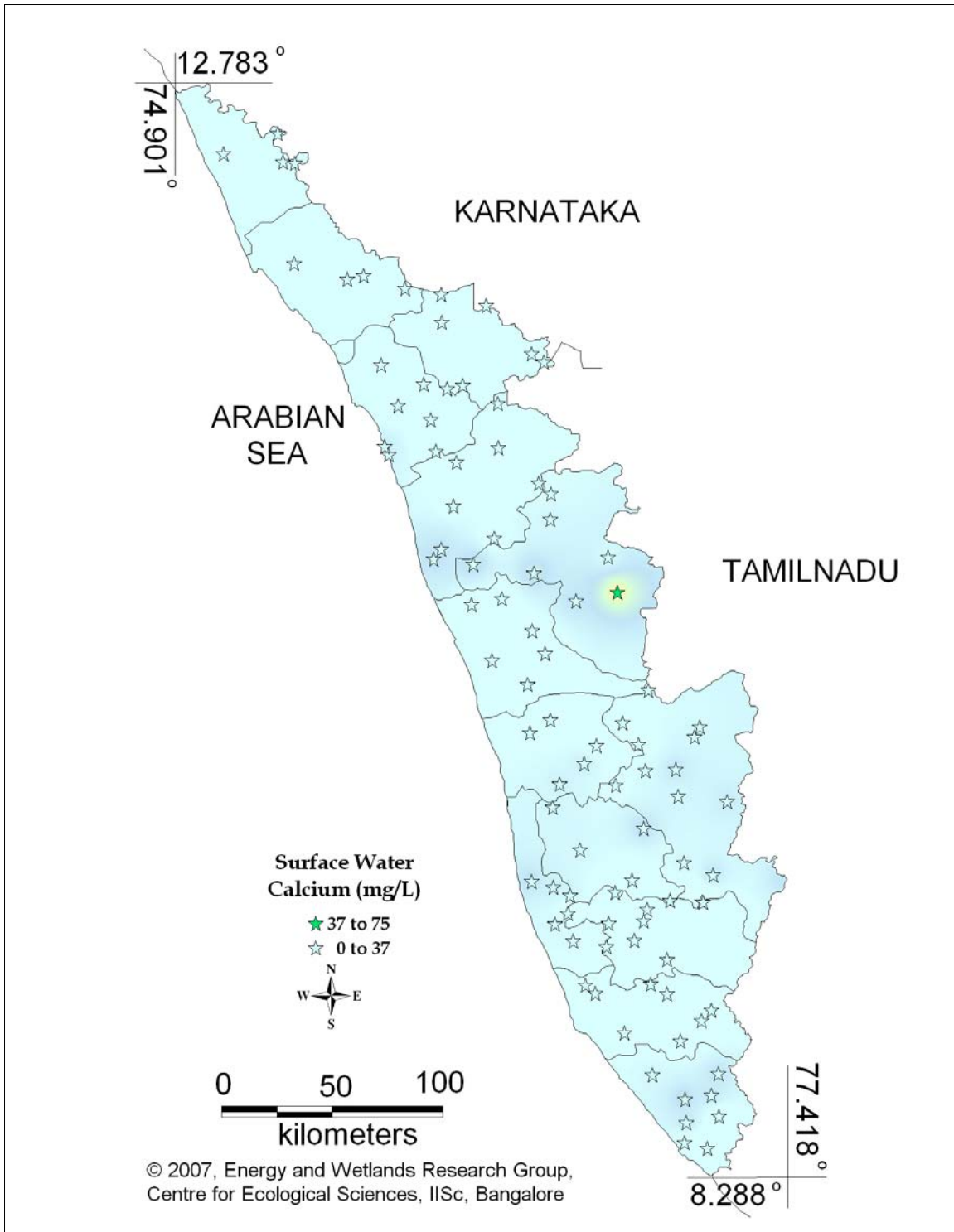


Figure 16.1: Spatial variation of calcium in Kerala's surface water

# Surface water - Calcium

Tolerance limit for inland surface waters subject to pollution

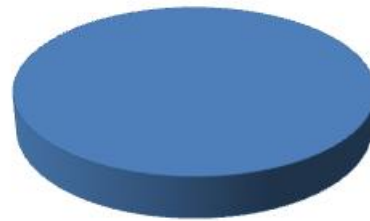
Desirable Limit: 75 mg/L

Permissible Limit: 200 mg/L

## Calcium

■ 98 samples are within desirable limit (75 mg/L)

100%



### Remarks

All the 98 surface water samples collected from rivers, streams and lakes spread over in Kerala are under the inland surface water standard.

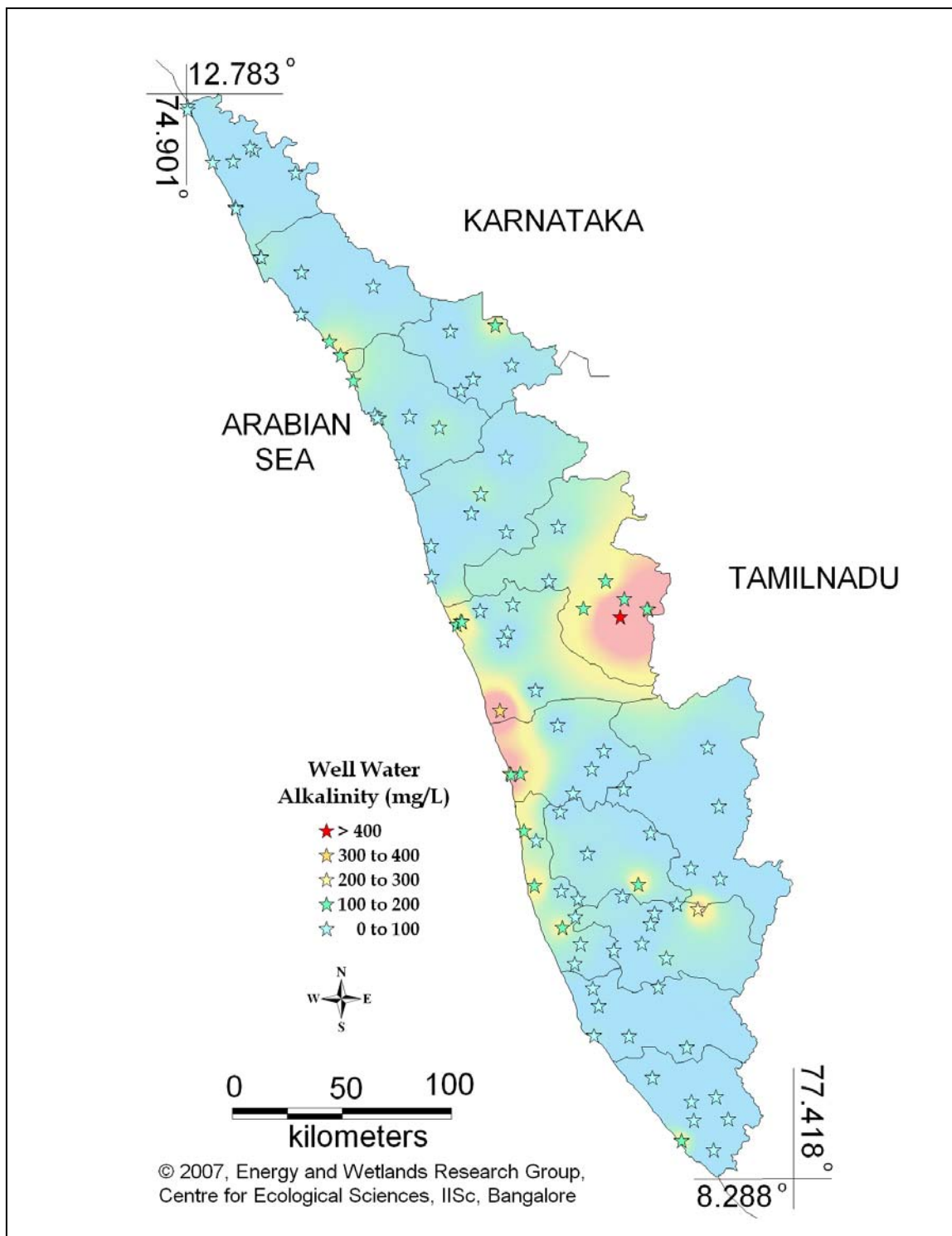


Figure 16.2: Spatial variation of calcium in Kerala's Well water

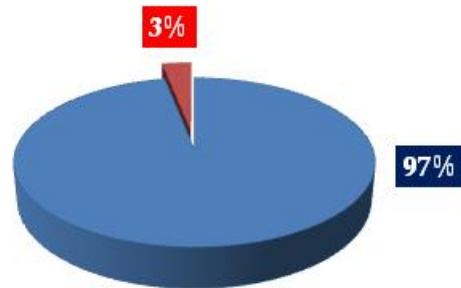
# Well water - Calcium

Standard for Drinking Water (BIS 105000)

Desirable Limit: 75 mg/L  
Permissible limit in the absence of an alternative source: 200mg/L

## Calcium

- 95 samples are within desirable limit (75 mg/L)
- 3 samples are above desirable limit (>75 mg/L)



### Remarks

Well water at following sites have calcium above desirable limit

Location	Value	District
Ponnani	109.02	Malappuram
Koodungalur	120.24	Thirssur
Fort Cochin	157.11	Ernakulam

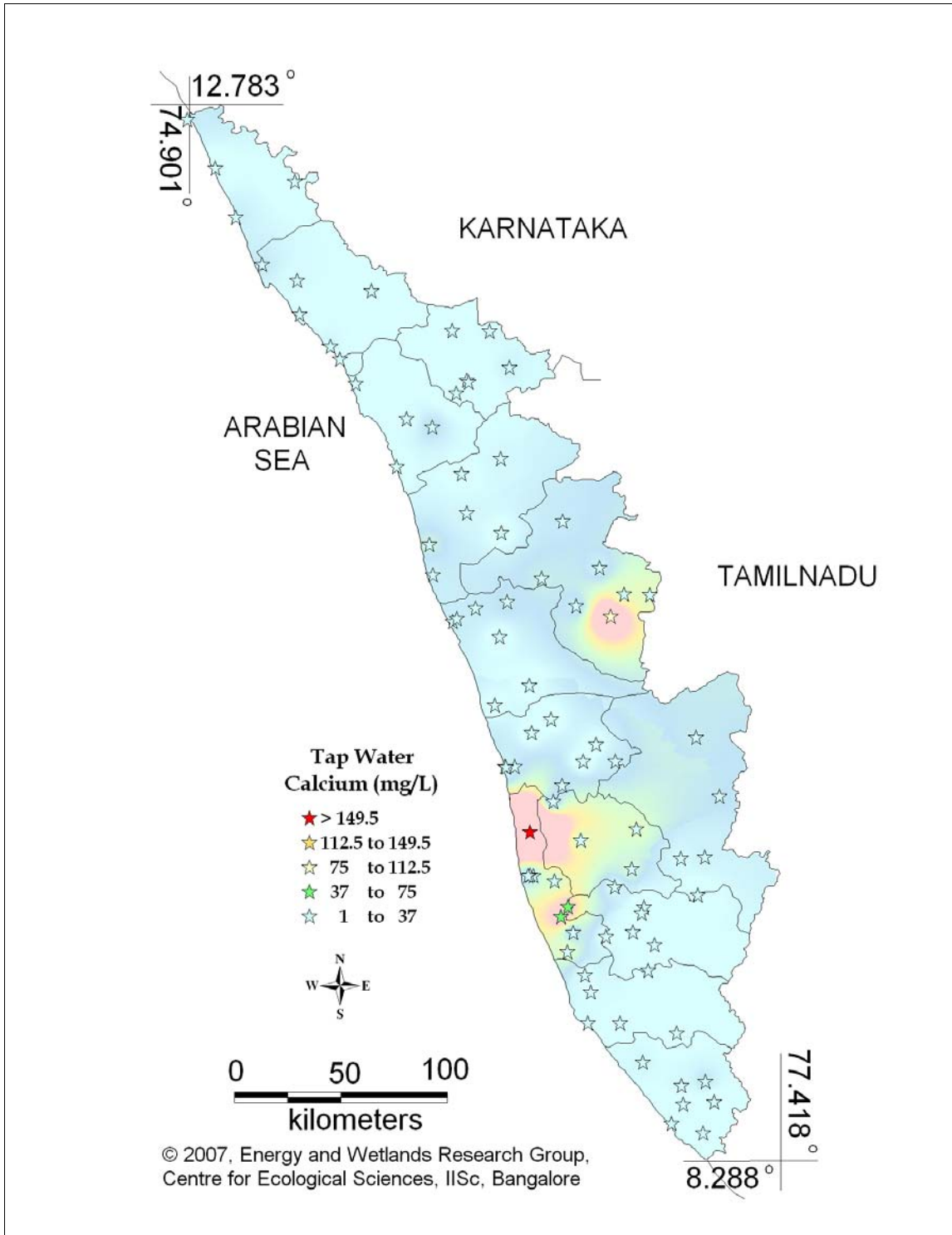


Figure 16.3: Spatial variation of calcium in Kerala's Tap water

# Tap water- Calcium

Tolerance limit for inland surface waters subject to pollution

Desirable Limit: 75 mg/L

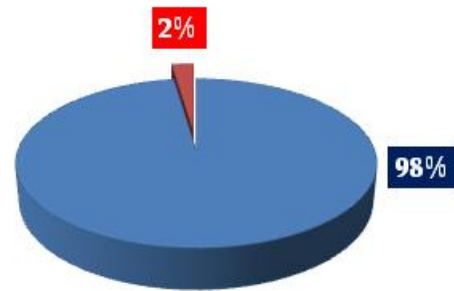
Permissible Limit: 200 mg/L

Encrustation in water supply structure and adverse effect on domestic use

## Calcium

■ 84 samples are within desirable limit (75 mg/L)

■ 2 samples are above desirable limit (>75 mg/L)



### Remarks

Tap water at following sampling sites have calcium above desirable limit

Location	Value	District
Kollengode-Vellanara	92.99	Palakkad
Kalikulam Junction	440.88	Alappuzha