

# Sulphate

Two forms of sulphur are commonly found in drinking water: sulphate and hydrogen sulphide. Both forms are nuisances and usually do not pose a health risk at the concentrations found in domestic wells.

Sulphate is a combination of Sulphur and oxygen, part of naturally occurring minerals in some soil and rock. The mineral dissolves over time and is released into ground water. Hydrogen sulfide is produced by Sulphur-reducing bacteria, which use sulphur as an energy source. The bacteria chemically change natural sulfate in water to hydrogen sulfide. Hydrogen sulfide gas also occurs naturally in some ground water. It is found in deep or shallow wells.

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

Sulphur a secondary water contaminant, with no direct threat to human health. Sulphate gives water a bitter taste and can have a laxative effect that may lead to dehydration. Hydrogen sulphide gives water a “rotten egg” odor and taste, and can cause nausea. Both forms of sulphur damages water distribution system. Sulphate causes scale buildup in pipes, producing a dark slime that can clog plumbing and stain clothing. Hydrogen sulphate is corrosive to metals such as iron, steel, copper and brass. It can tarnish silverware and discolor copper and brass utensils. Hydrogen sulphide also can cause yellow or black stains on kitchen and bathroom fixtures.

Coffee, tea and other beverages made with water containing hydrogen sulfide may be discolored and the appearance and taste of cooked foods can be affected. High concentrations of dissolved hydrogen sulfide also can foul the resin bed of an ion exchange water softener.

## **Remedial Measures**

Sulphate can be partially removed by reverse osmosis.

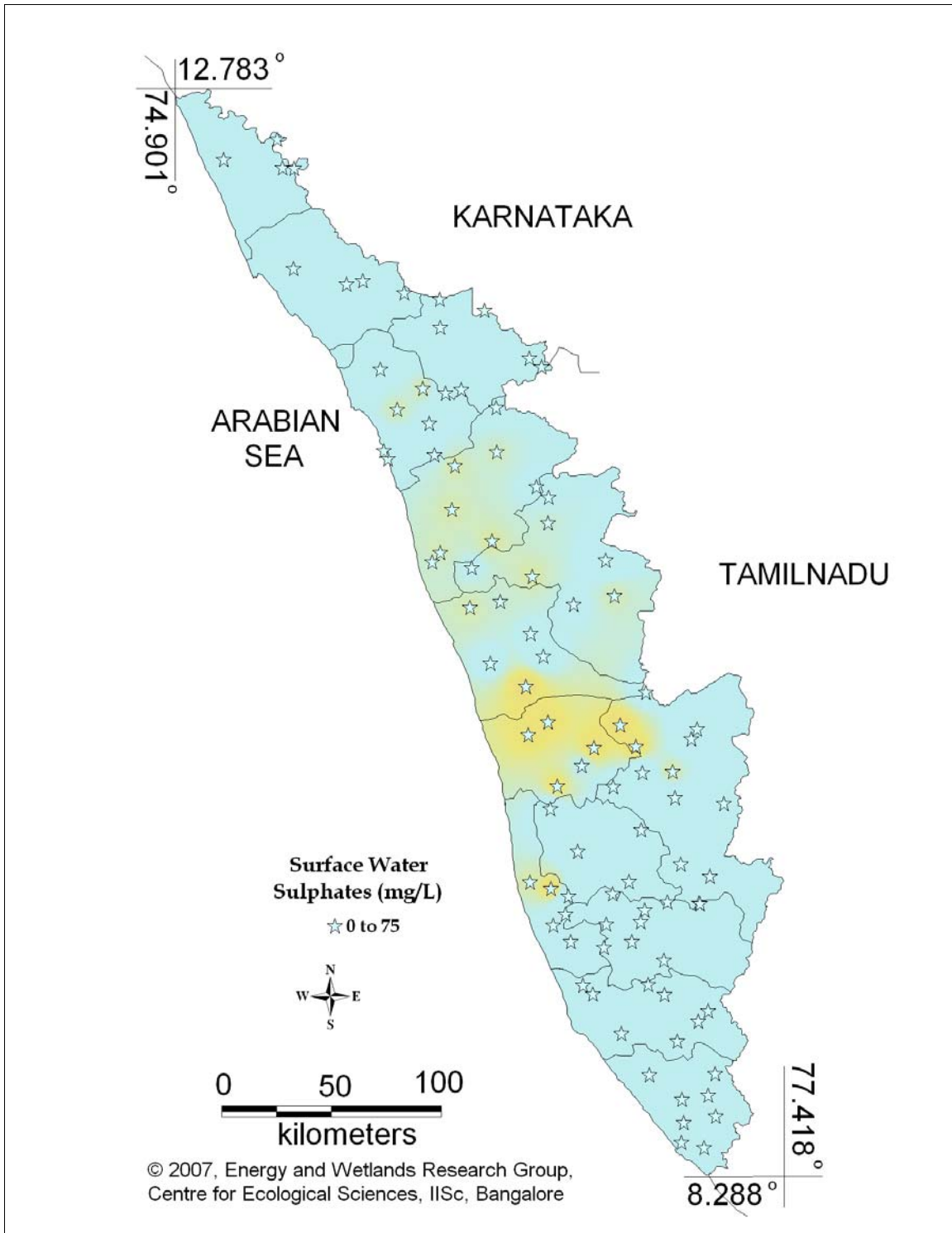


Figure 14.1: Spatial variation of sulphate in Kerala's surface water

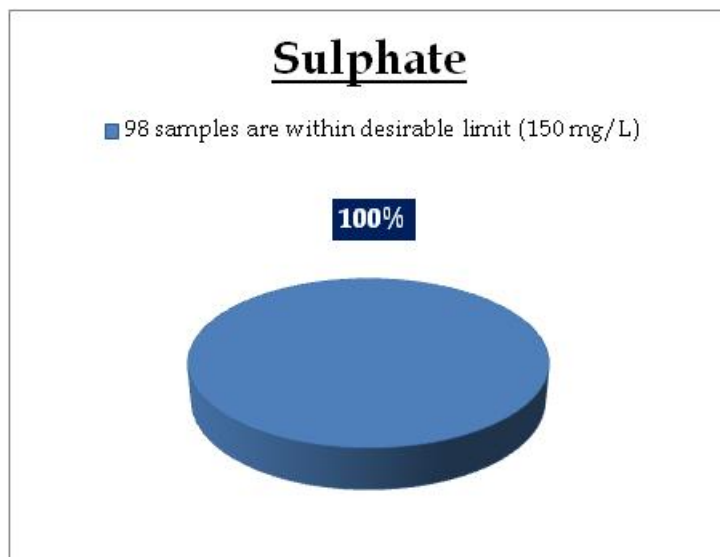
# Surface water - Sulphate

Standard for Drinking Water (BIS 105000)

Desirable Limit: 150 mg/L

Permissible limit in the absence of an alternative source: 400mg/L

Beyond this cause gastrointestinal irritation when magnesium or sodium is present



## REMARKS

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

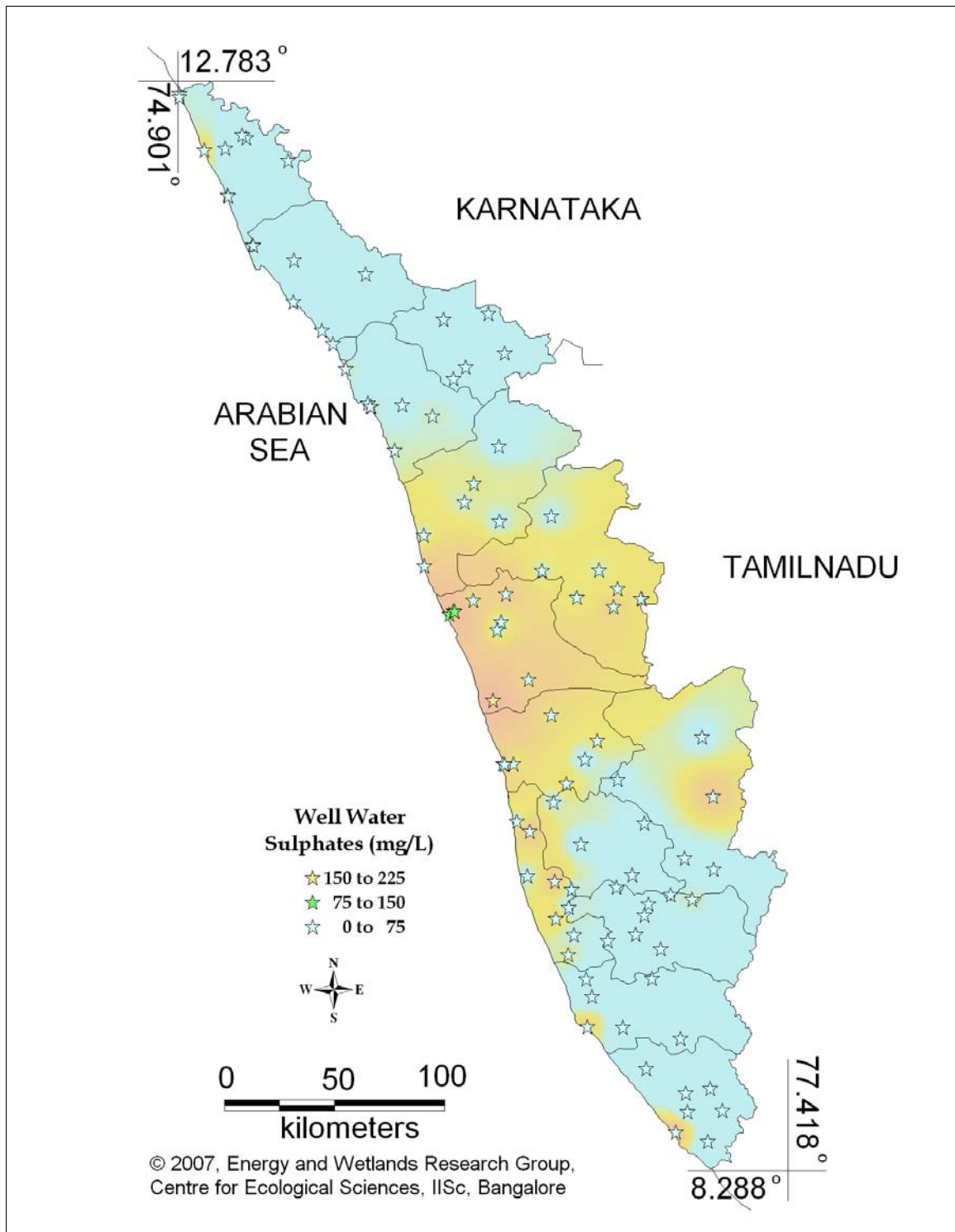


Figure 14.2: Spatial variation of sulphate in Kerala's well water

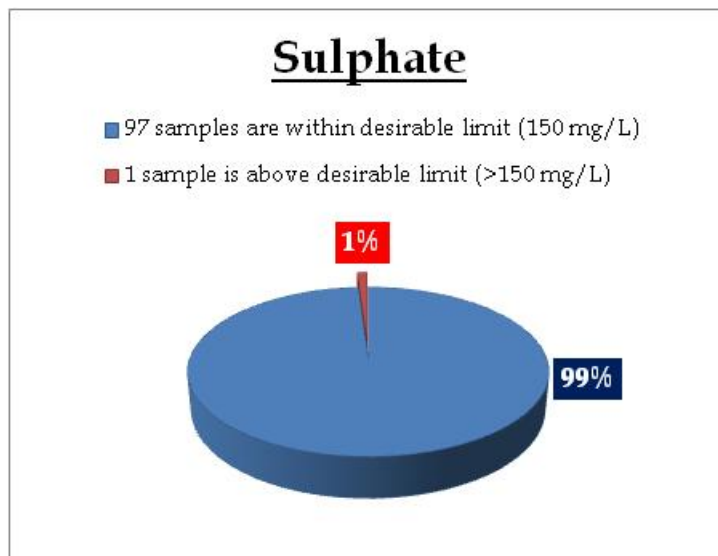
# Well water - Sulphate

Standard for Drinking Water (BIS 105000)

Desirable Limit: 150 mg/L

Permissible limit in the absence of an alternative source: 400mg/L

Beyond this cause gastrointestinal irritation when magnesium or sodium is present



## Remarks

Sampling sites above desirable limit, value (mg/L) and district is listed below:

Location	Value	District
Koodungalur	200.7	Thrissur

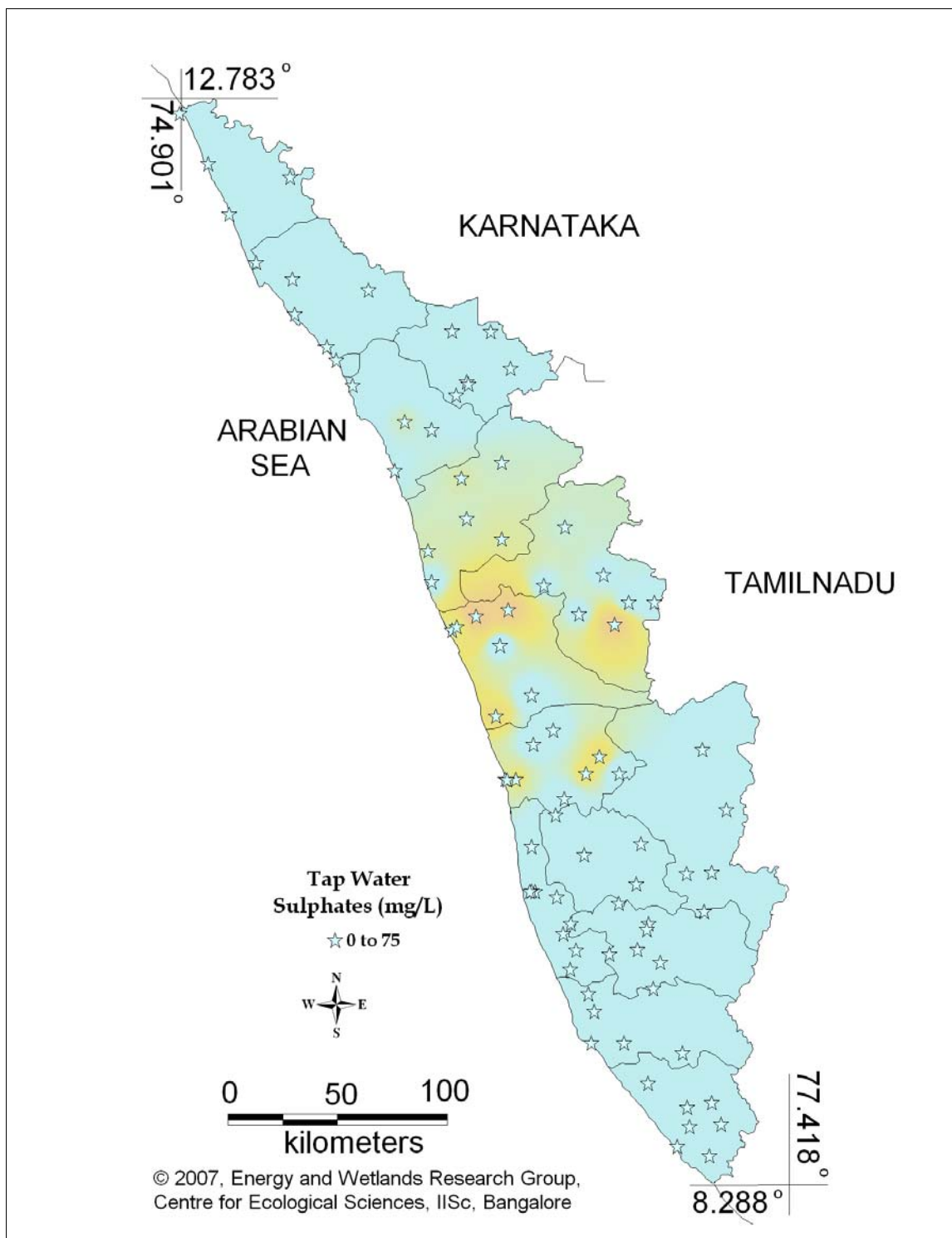


Figure 14.3: Spatial variation of sulphate in Kerala's tap water

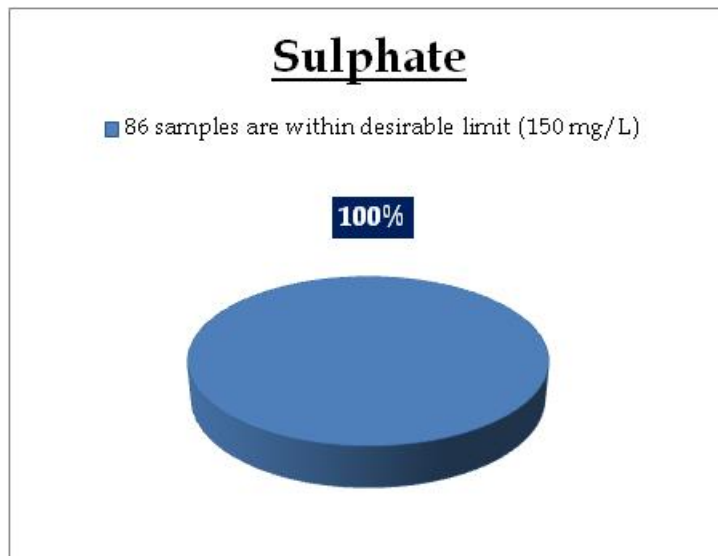
# Tap water - Sulphate

Standard for Drinking Water (BIS 105000)

Desirable Limit: 150 mg/L

Permissible limit in the absence of an alternative source: 400mg/L

Beyond this cause gastrointestinal irritation when magnesium or sodium is present



## Remarks

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