

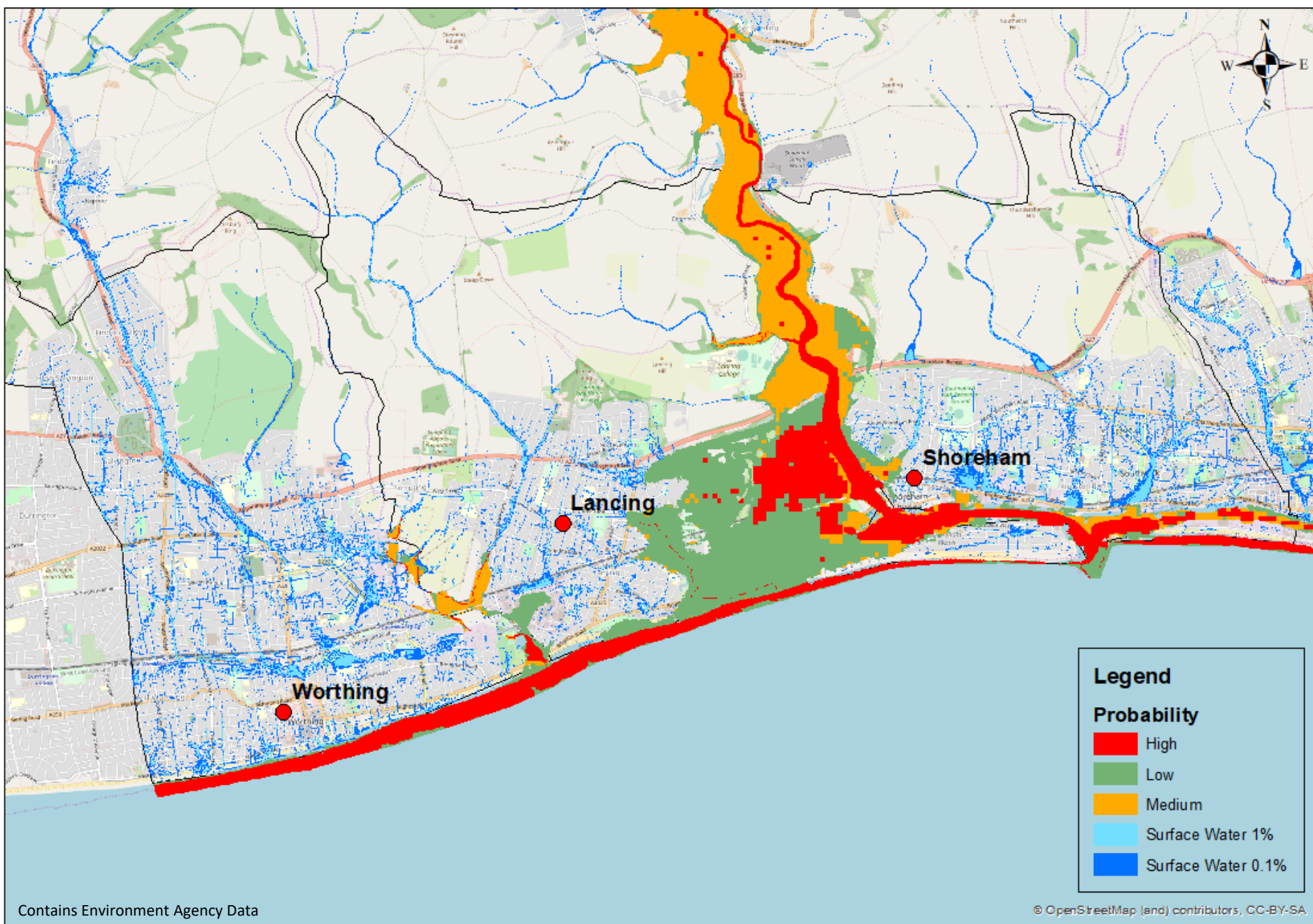


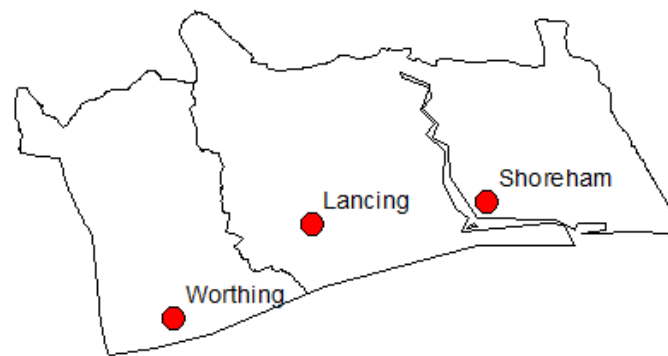
# **Climate Resilience**

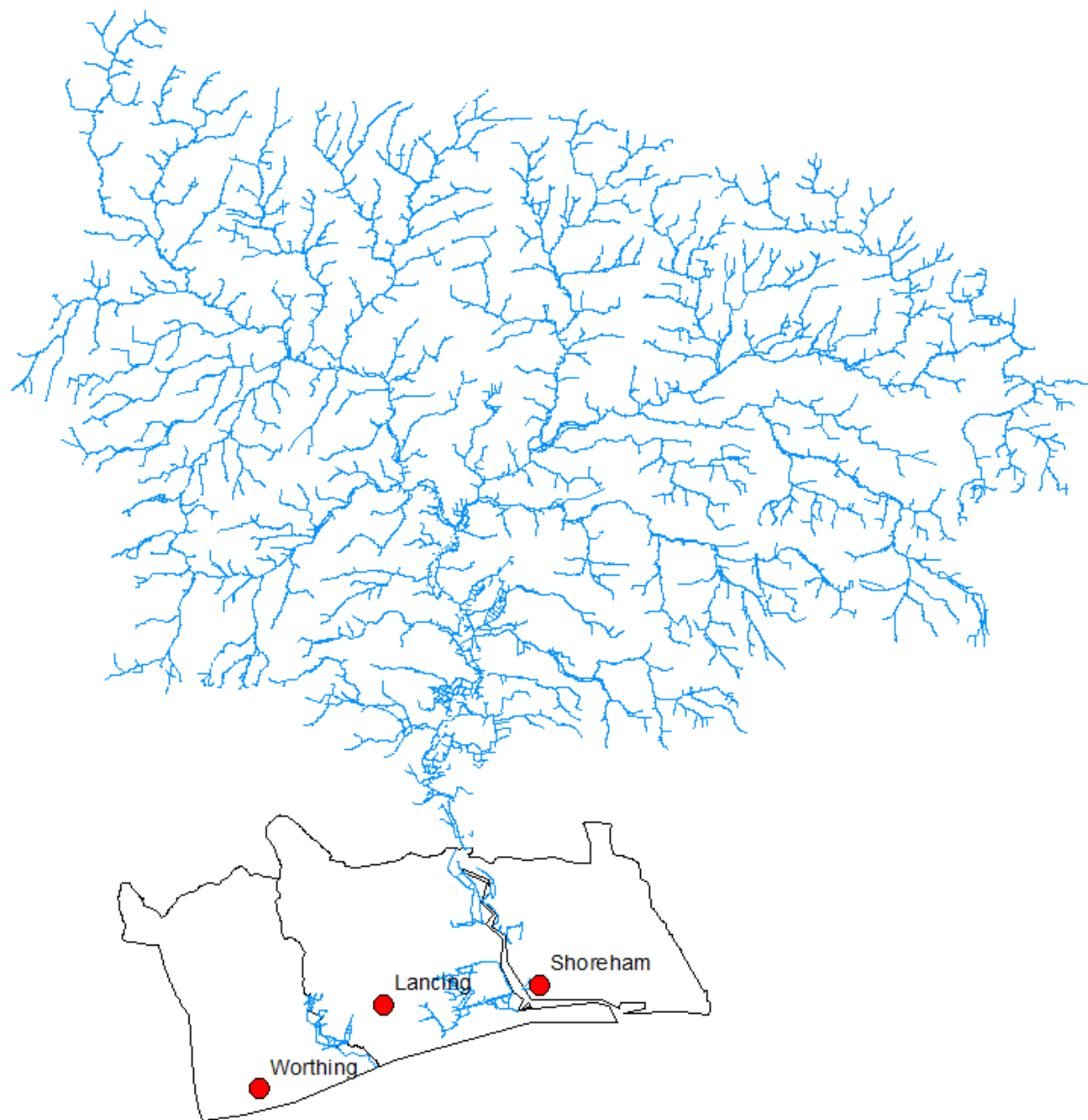
**Rivers, Streams and Surface Water**

What is the first thing  
we think of when  
considering future  
resilience in the water  
environment?

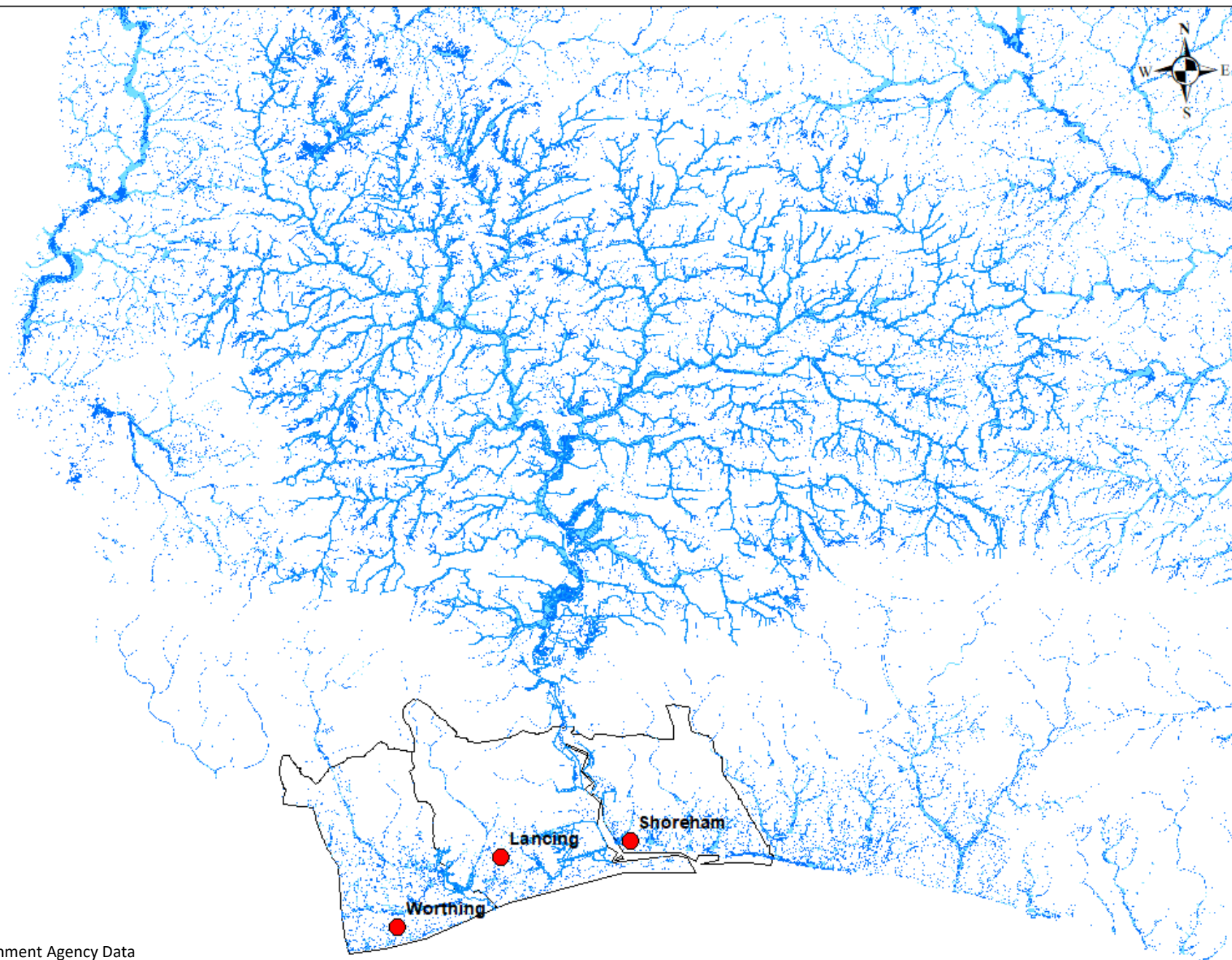












# Natural Flood Management (NFM)

A range and combination of techniques to “slow the flow”



**Simple, Low Cost & Effective**



# Natural Flood Management (NFM)

A range and combination of techniques to “slow the flow”





# Natural Flood Management (NFM)

A range and combination of techniques to “slow the flow”

## Benefits:

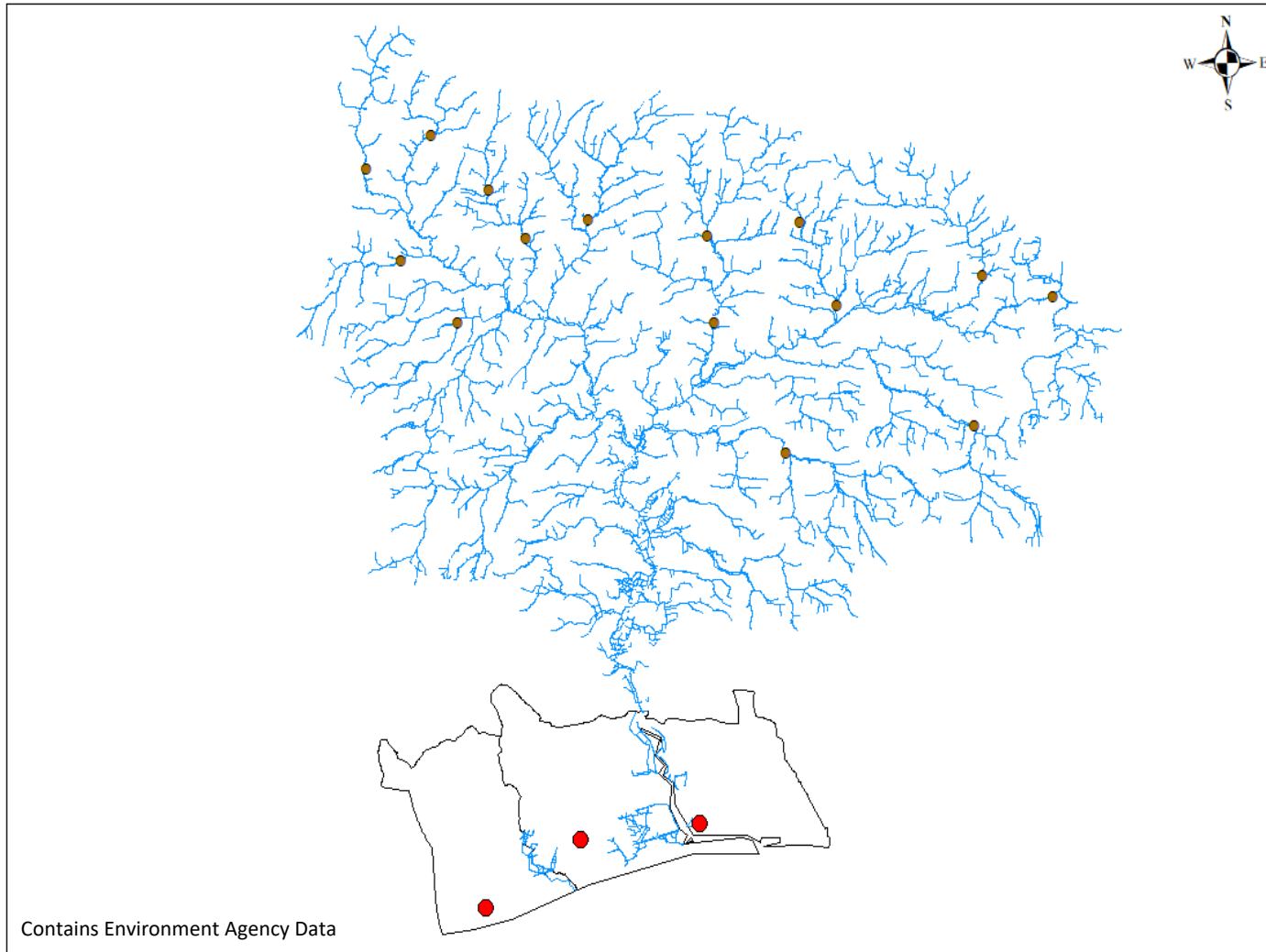
- Slows the flow of water
- Alters the hydrological regime of a watercourse
- Used to “kick” water onto the floodplain

## Considerations:

- Works best in upper catchment areas
- Changing “all” hydrological regimes may not solve the issues
- Payments for land/water connectivity?!?

# Natural Flood Management (NFM)

A range and combination of techniques to “slow the flow”



## Altering the Hydrology in the Upper Catchment



# Natural Flood Management (NFM)

A range and combination of techniques to “slow the flow”



**Connection & Protection of Floodplains**



# Urban NFM

A range and combination of techniques to increase permeability and storage





A photograph of a dry, cracked riverbed. The foreground is filled with dark, parched earth that has cracked into a mosaic of irregular polygons. In the background, a line of trees with bare branches stands against a pale sky. The banks of the dry river are covered in green moss and small plants, suggesting a recent or seasonal change in water levels.

# Resilience for Drought



“The most noticeable change is the way that the sunny weather in spring combines with the high levels of phosphate and nitrate that is in the river and creates particular algae that is unfortunately smothering the riverbed.”

Simon Ffennel, Horticulturist, Hampshire



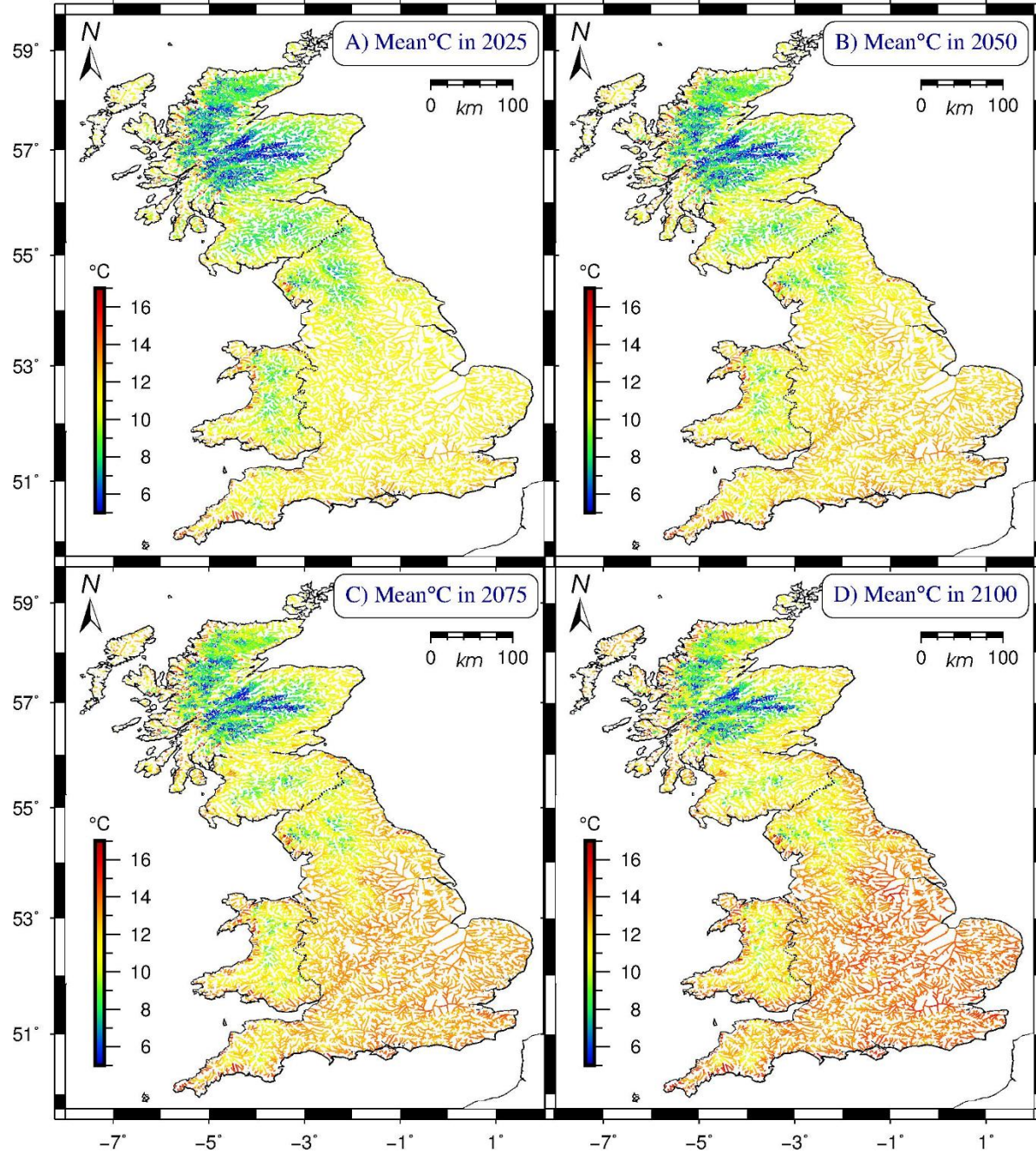
# Resilience for Drought

## Problems

- Higher concentration of pollutants
- Lose minimum depth of 150mm for functioning eco-systems
- Salmonids stop feeding at 19C
- Coarse fish metabolisms suffer at 12C+
- Lack of recreational opportunities

## Solutions?

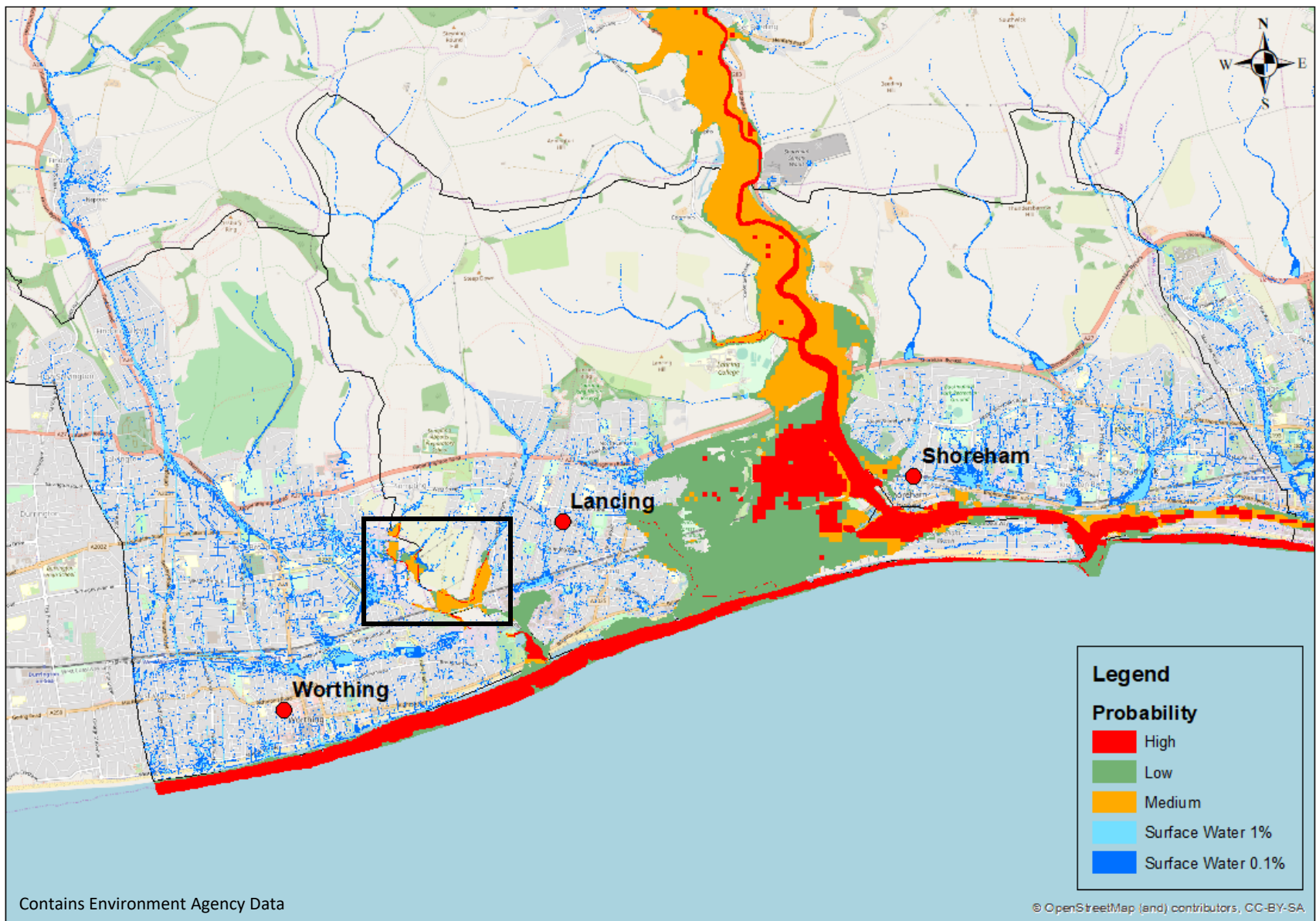
- Using less water eases pressure on chalk streams fed from the aquifers
- Proper river management and enhancement **NOT** dredging
- Shading through tree planting and retention







Enhancing Places, Inspiring Communities  
An EPIC Tale in Adur & Worthing

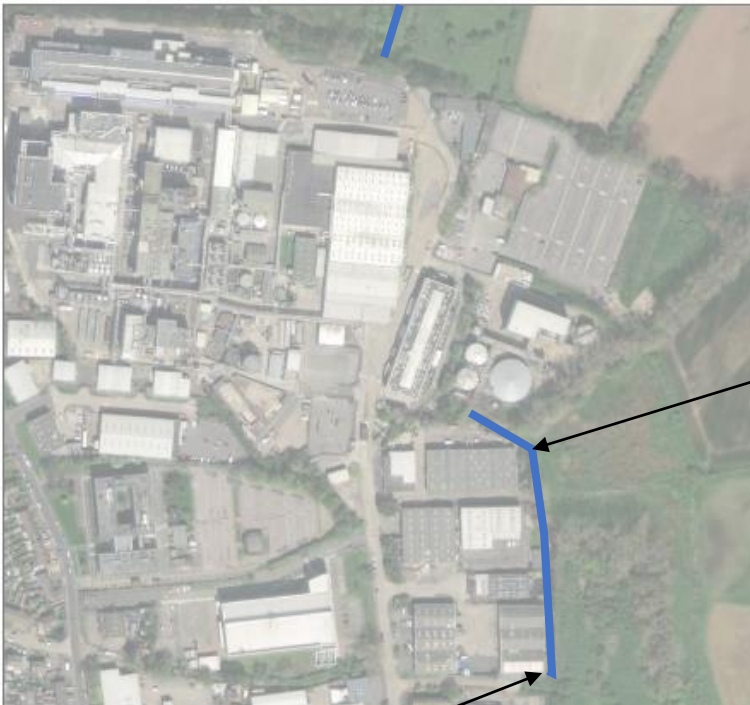






Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community





Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community





















# Take Home Messages

- Climate Resilience Includes both Flooding & Drought
- NFM is wide ranging and fits large and small projects
- Naturalised rivers bring multiple benefits
- River shading is vital to ecosystem health
- Collaboration & a willingness to change approaches is vital
- Considering individual and community water use is essential