

Atlantic salmon are genetically adapted to their local river



Turun yliopisto



Victoria L. Pritchard¹, Hannu Mäkinen¹, Juha-Pekka Vähä¹, Jaakko Erkinaro²,
Eero Niemelä², Panu Orell² & Craig Primmer¹

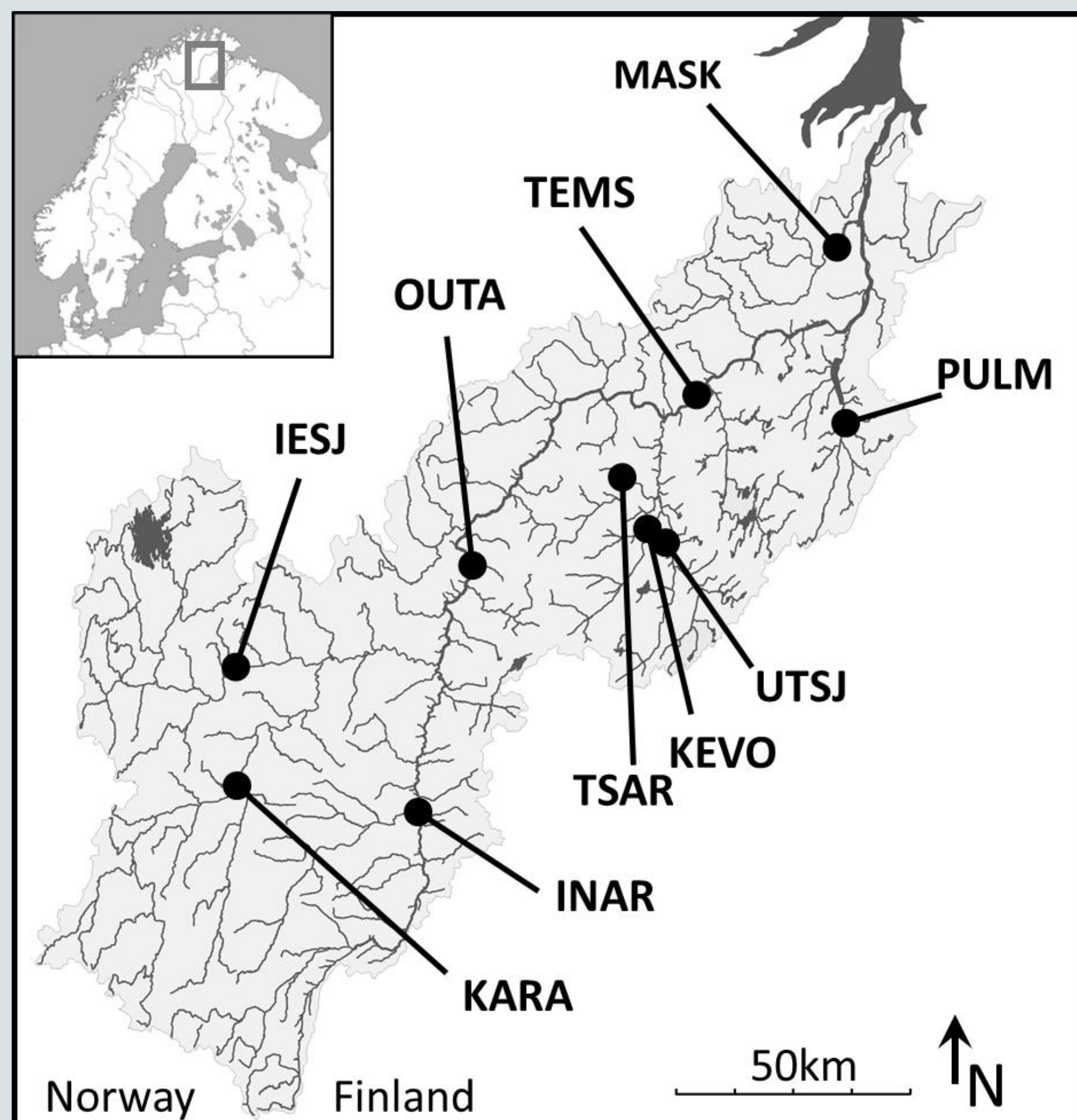
¹ Division of Genetics & Physiology, Department of Biology, University of Turku, Finland;

² Natural Resources Institute Finland (Luke), Utsjoki, Finland

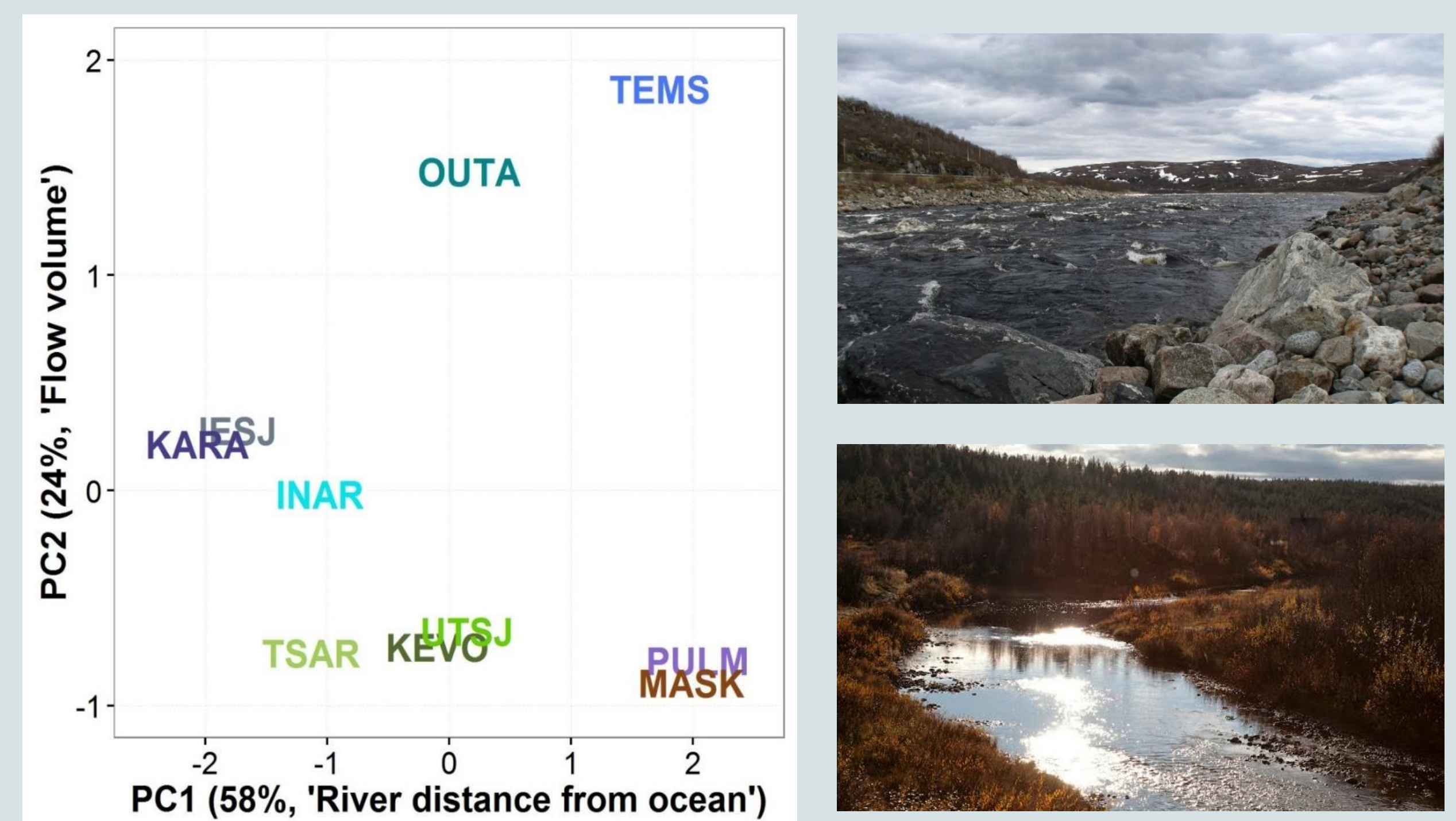


- The Tenojoki river system contains multiple, genetically distinct Atlantic salmon populations.
- These populations may be adapted to specific environmental conditions in their local river.
- We can identify the genes involved in this adaptation by looking at variation across the genome.
- This information can be used to guide conservation and management of these Arctic salmon stocks.

1. We collected young fish from 10 sites in the Teno.



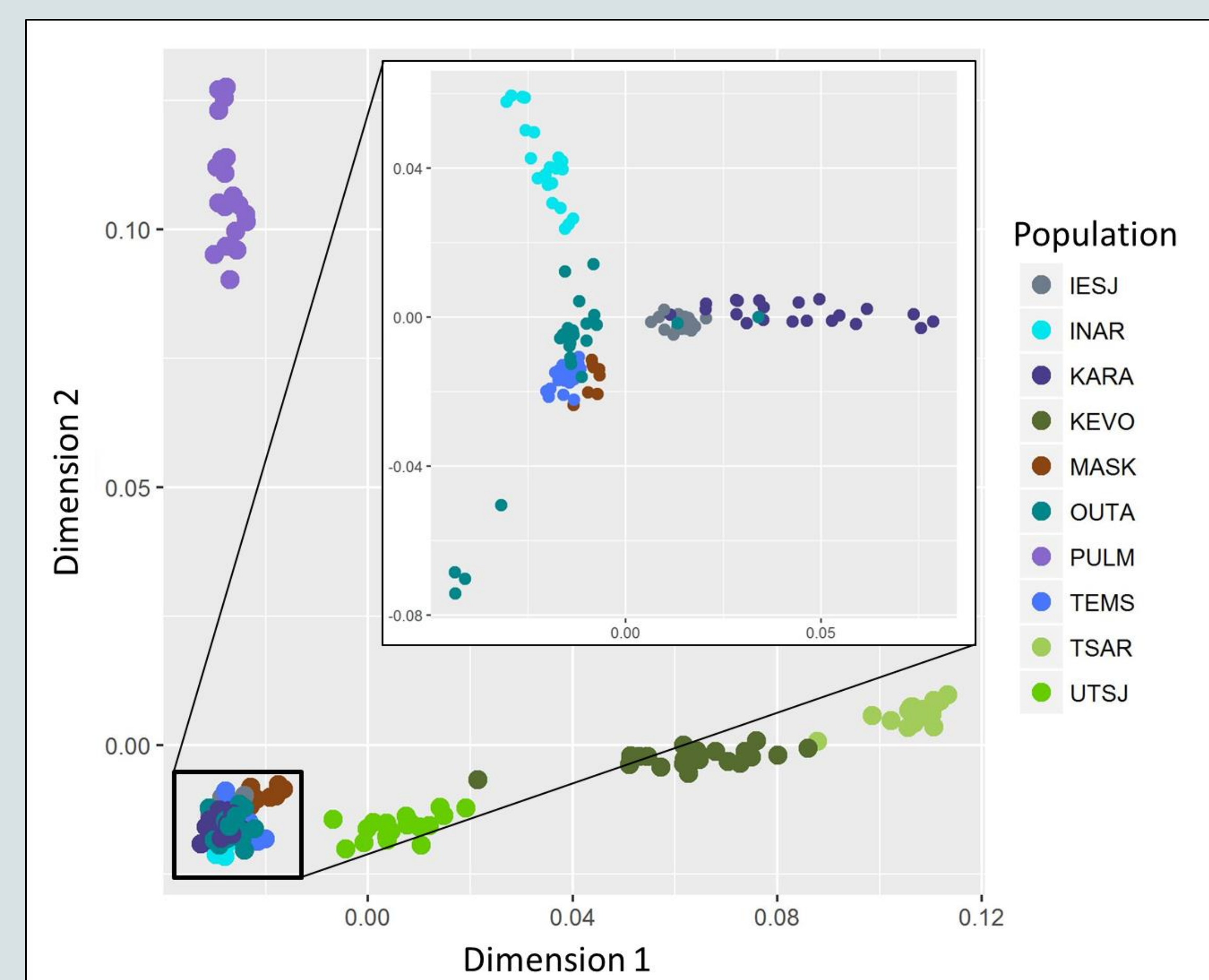
2. Sites varied in their environmental conditions.



3. We genotyped each fish for 220,000 genetic markers distributed across the genome.



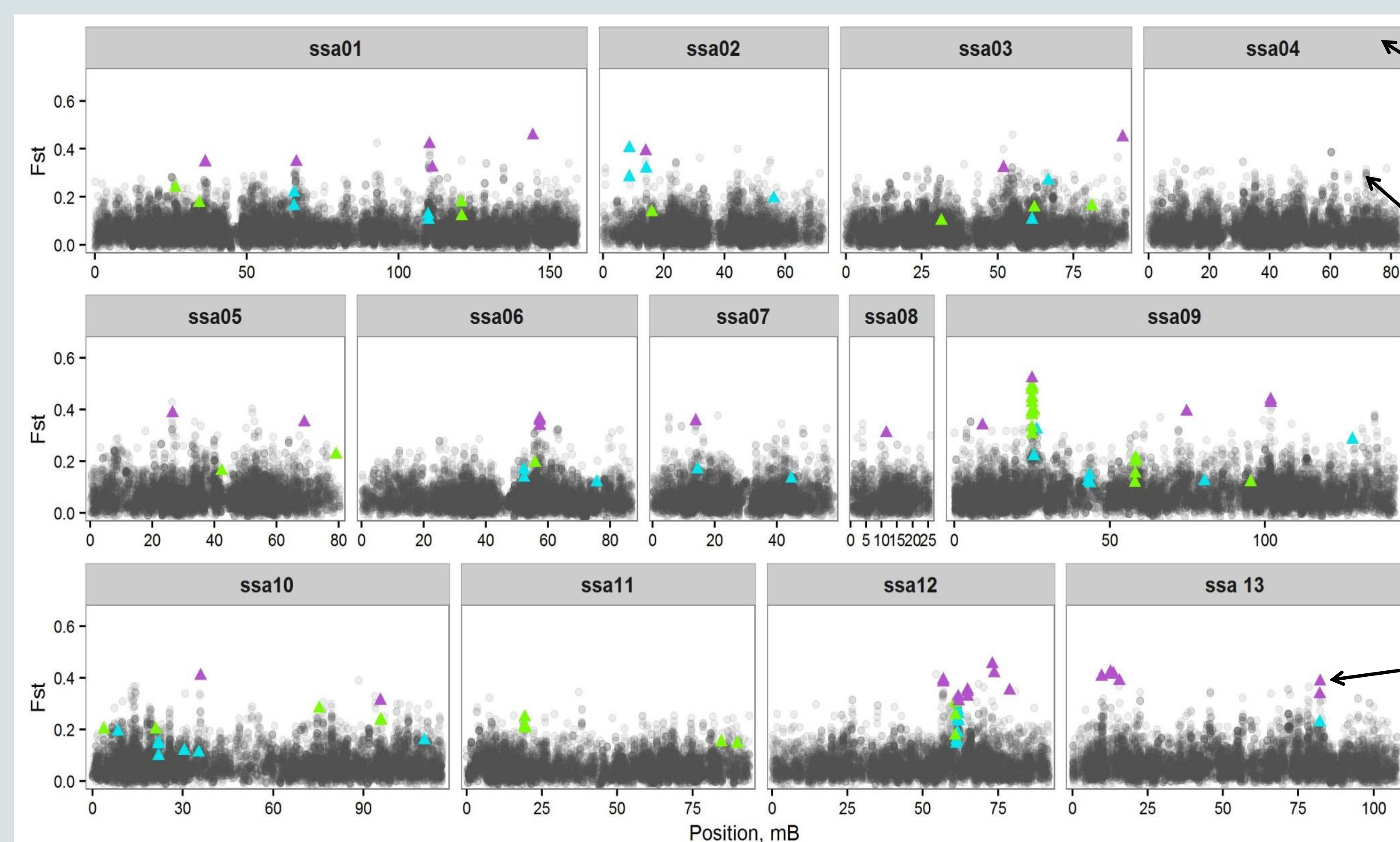
4. Populations were genetically different.



5. We used statistical methods to identify regions of the genome that were:

- associated with environmental variation, or
- particularly different between different rivers

Markers associated with PC1
(\approx river distance from ocean)
Markers associated with PC2
(\approx flow volume)
Markers very different amongst populations



Each box shows a chromosome

Each dot is a genetic marker, arranged by its position on the chromosome

Y-axis indicates how different the markers are amongst populations.

Colours indicate statistically significant markers