ISSO20E009731

Redimartion for the **E**nvironment of the **P**o **R**iver **T**erritory (REPORT)

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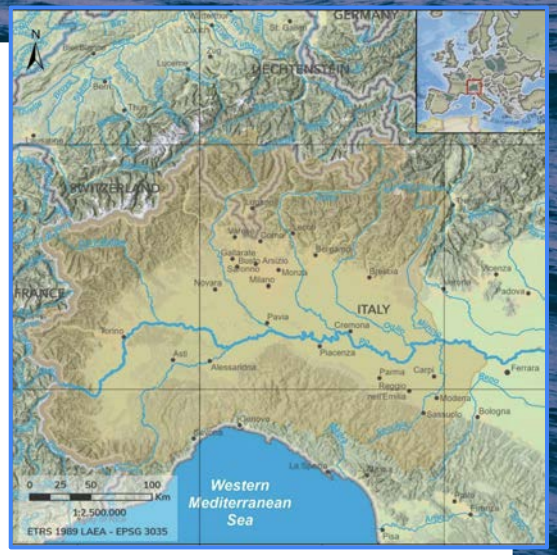
Mission Statement

REPORT's goal is to analyze the environmental and anthropogenic stressors within the Ro River Watershed and provide recommendations on reducing the effects on this vital Swiss and Northern Italian watershed. Through these recommendations, we hope to improve the river's environmental conditions by 50% and make it environmentally and economically sustainable by 2035. The Po River serves as a key economic, agricultural, navigation, and recreation driver of the region, which we aim to maintain and sustain in the future.

Background and History

- Po River is the longest river in Italy 405 miles (652 kilometers).
- The river basin encompasses approximately 27% of Italy's national territory.
- Flows through 4 major regions in Italy.
- Originates in the Cottian Alps near the French border and flows eastward, forming the Po valley.
- It empties into the Adriatic Sea near Venice and Ferrara.



Po River Snapshot

- Countries: Italy & Switzerland
- Passes through Major Regions in Italy: Piedmont, Lombardy, Emilia-Romagna and Veneto
- Major Water Uses: Agriculture, Transportation and Tourism
  - Main land uses: Agriculture 41%; Forest 51%, and Urban/other 7%.
- River Length: 405 miles (652 kilometers)
- Major Tributaries: Dora Riparia, Dora Baltea, Sesia, Ticino, Adda, Oglio, and Mincio
- Drainage area: 71,327 km2, 70,000 km2 of which are in Italy, the rest in Switzerland
- Basin Population: 17M (almost ⅓) of Italy's population
- Pedo-climate: Southern and Alpine regions; Mediterranean north, Mediterranean mountains and Alpine south zones

Policies and Mandates

Legislation & Agreements:

- “Renaturation of the Po area” (PNRR)
- Law 183/1998
- The Po Valley Media River Contract (November 2024)
- The Flood Risk Management Plan of the Po Basin (PGRA)

Agencies:

- Po River District Basin Authority (ADBPO)
- The Interregional Agency for the Po River (AIPo)
- Italian National Association of Land Reclamation (ANBI)
- World Wide Fund for Nature (WWF Italy)
- Italian Aggregates Association

Problem 1: Nutrient Pollution

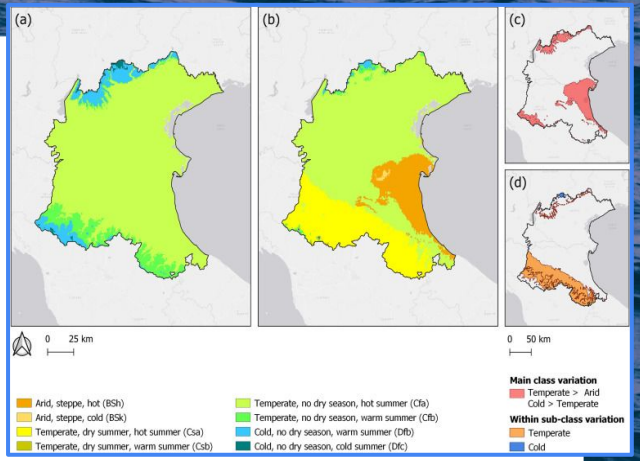
- About 41% of the Po basin land use is agriculture.
- The Po basin hosts a large livestock population, approximately 3.1 M cattle (around 50% of the national stock) and 6 M pigs (around 65% of the national stock).
- The annual nitrate load exported from the Po River basin has increased 2–3-fold over two decades.
- Agriculture and livestock together contribute about 80% of the total nitrogen load of the Po River basin, which has led to significant pressure to both surface and groundwater water bodies.

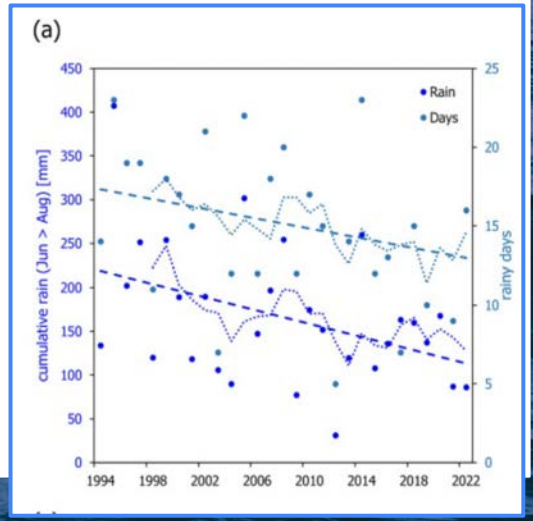
Proposed Nutrient Pollution Solution

- Optimized fertilization, includes the efficient use of fertilization without excess or waste
- Zeolites rock soil amendments, lowers nutrient loss and increases water
- Conservation tillage, not tilling as much decreases soil erosion and runoff

Problem 2: Drought

- Increasing temperatures and lowering precipitation is leading to a drier climate.
- Changes in snowmelt conditions are worsening the dry conditions.
- Increased evaporation and increased water withdrawals.
- Aridification will impact agriculture industry.
- Drought conditions worsen other environmental conditions.
- 2022 Drought–worst drought in 2 centuries.





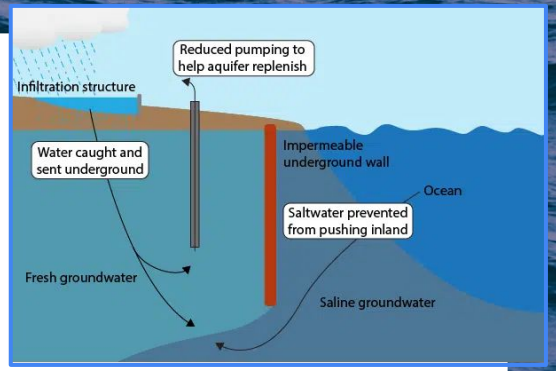
Proposed Drought Solution

- Overall the agriculture sector needs to improve and lower their water consumption in the Po River Watershed.
  - Planting crops suitable for the changing climate and water flow.
  - Addressing and improving deteriorating infrastructure and water distribution systems.
  - Addressing leakages and improving irrigation methods.
- Afforestation and reforestation events to stabilize the environment offer more reliances.
- Public Education efforts to keep citizen informed and conscientious about their water usage.

Problem 3: Saltwater Intrusion

- Saltwater intrusion is a result of drought in the Po River Delta
  - Causes include excessive pumping of groundwater, reduced flow of the river, and sea level rise
- The recorded water salinity was more than 2 g/l, the critical threshold FAO indicated for irrigation
- During the summer of 2022, much of the surface of the Po River Delta was exposed to saltwater intrusion, with water salinity peaks in July when the discharge reached the negative record of 104 m3s-1 at Pontelagoscuro.
- Impacts soil fertility, degrades coastal plants, and farmers agriculture

Proposed Saltwater Intrusion Solution



- Low head dam for saltwater wedge
- Modify water usage to increase stream flow
- Reduce groundwater pumping in/near the river
- Construct artificial subsurface barriers (such as cutoff walls or subsurface dams) to prevent saltwater from moving inland
- Inject freshwater into the aquifer through recharge (last resort because this would require a lot more water use)

Conclusion and Recommendations

- The Po River serves a key economic and agricultural resource for Northern Italy, but is under current threat from over-exploitation and climate change.
- Nutrient Pollution, Drought, and Saltwater Intrusion are the key challenges facing the Po River, all of which are interconnected and require integrated solutions.
- The agriculture sector will need to make concerted changes to their practices as one of the key conditions to the watershed deterioration.

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