

Introduction

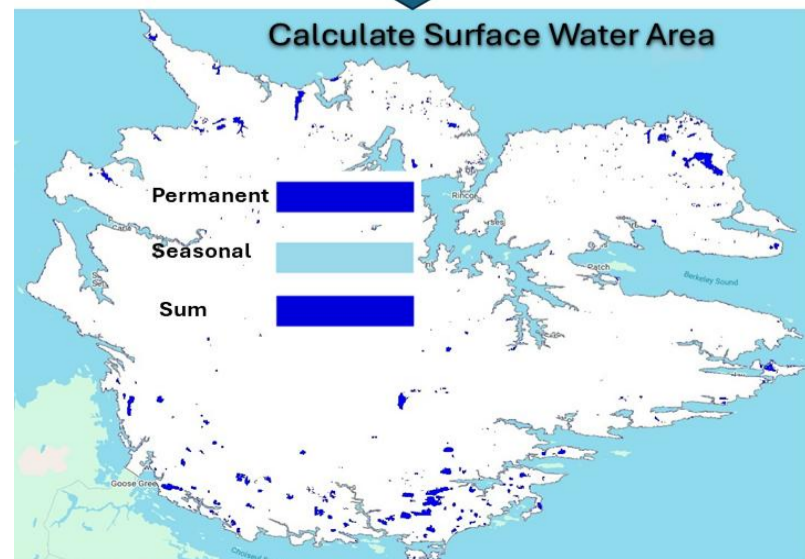
Freshwater is a limited resource essential for human survival and development. Despite covering most of Earth's surface, less than 3% is freshwater, and under 1% of that is readily accessible. Climate change poses a significant threat to freshwater systems, yet its impacts remain poorly understood in data-scarce regions. This lack of information challenges our ability to monitor changes and implement effective management strategies.

Methodology

Global Surface Water (GSW) Explorer datasets, (Landsat 5, 7, and 8) with 30 m resolution.

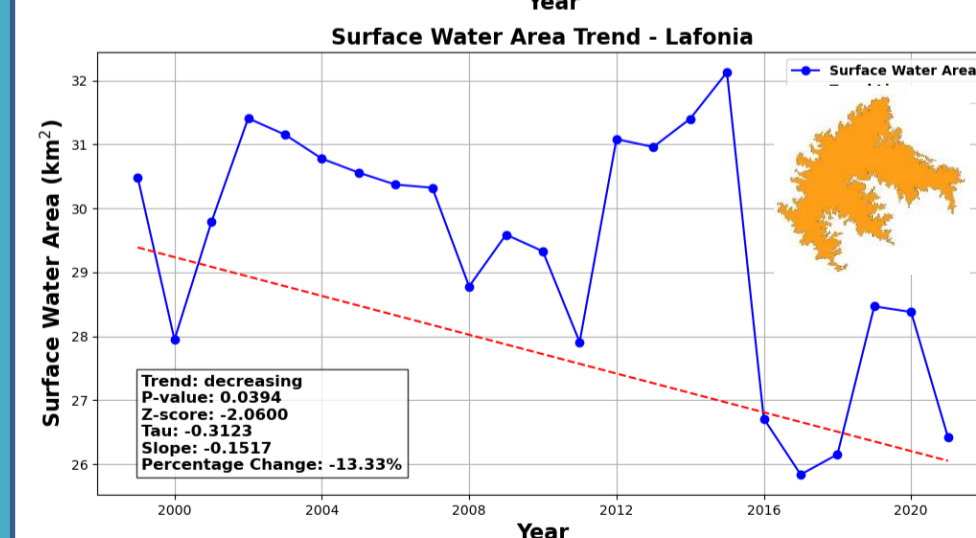
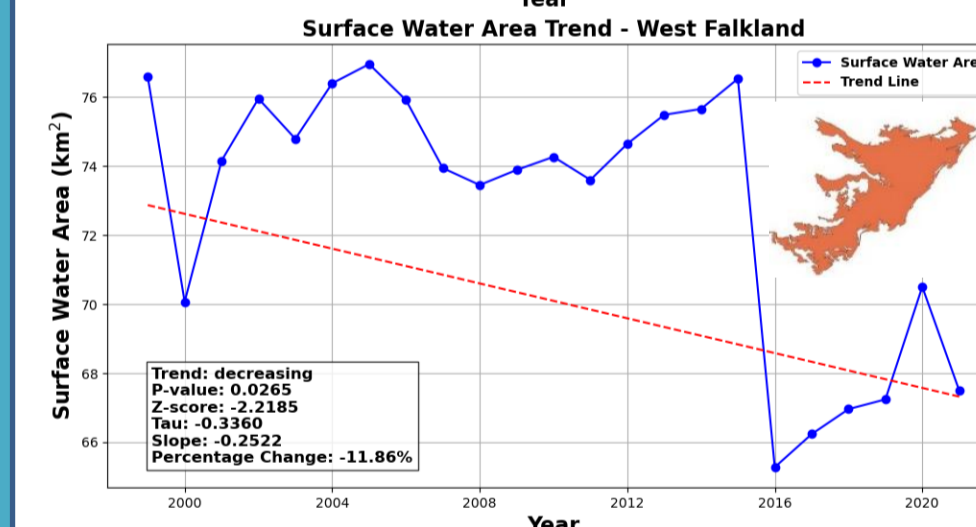
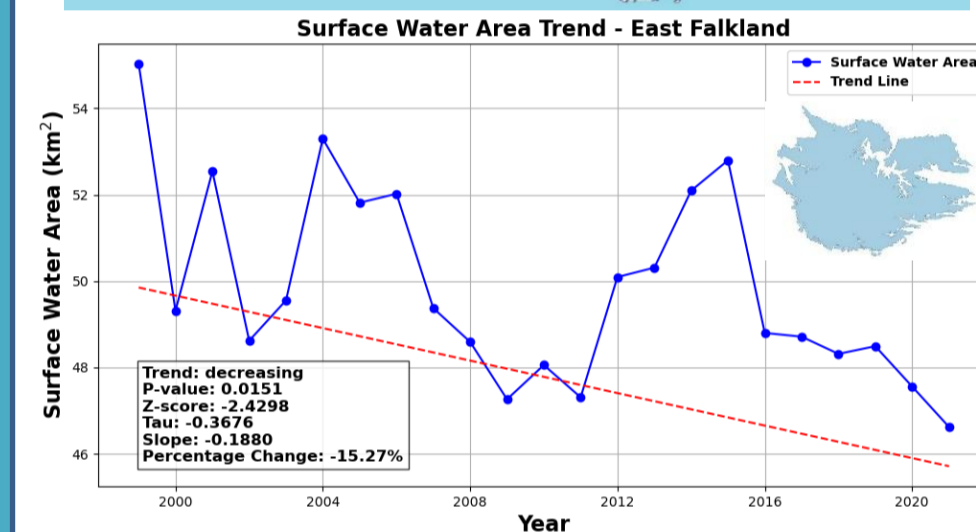
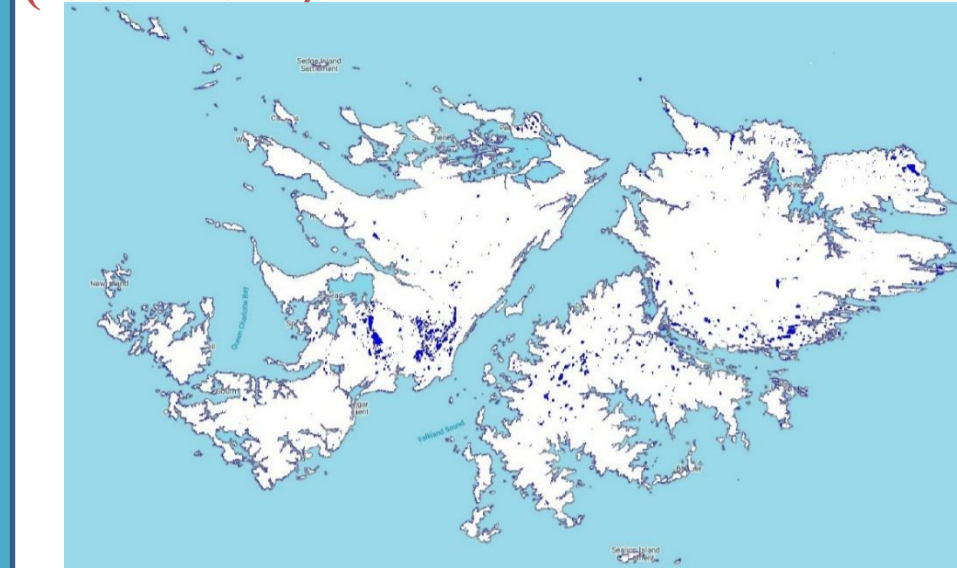


Calculate Surface Water Area



Results

Yearly Surface Water Area (km²) – (1999 -2021)

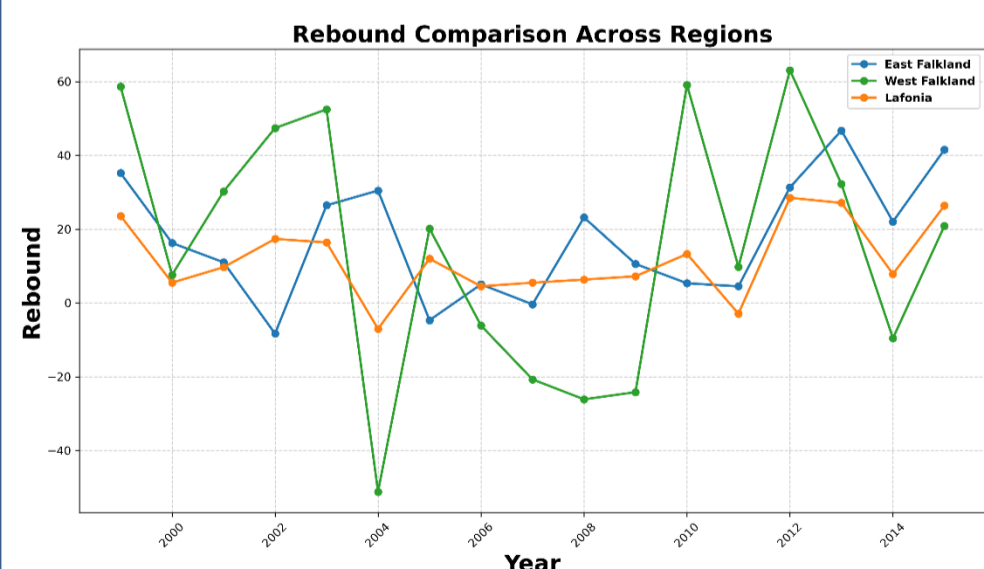
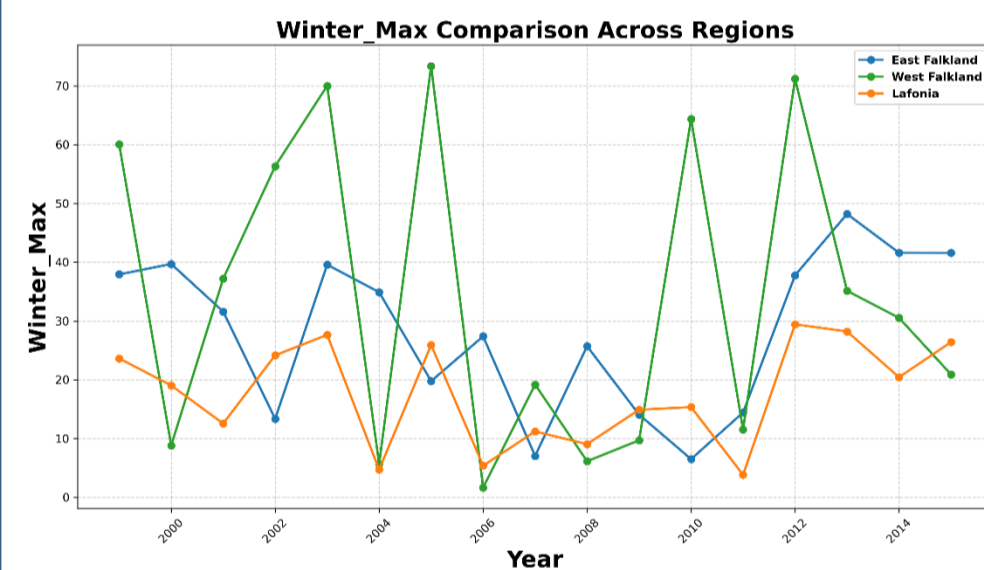
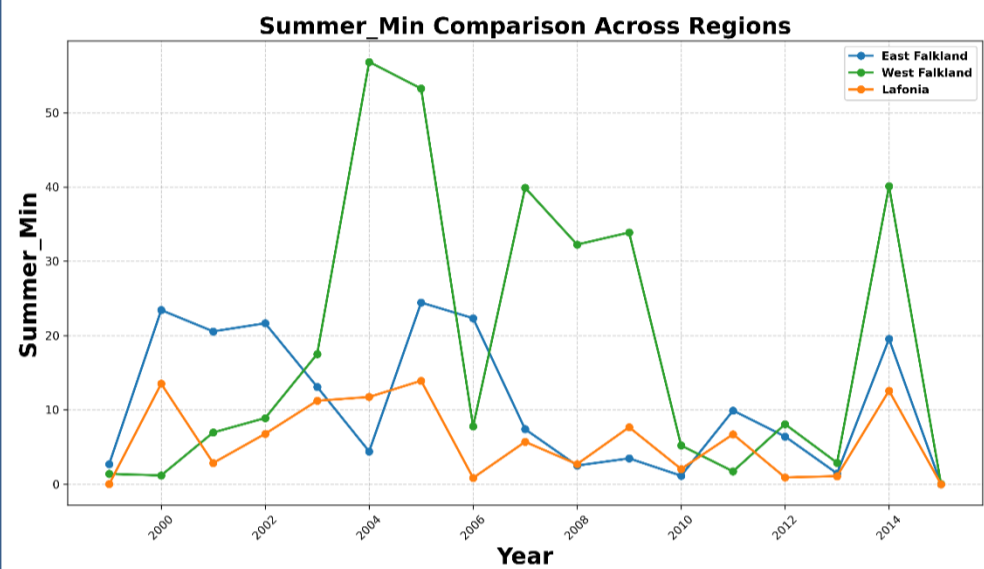


Monthly Surface Water Area (km²) – (1999 -2015)

Summer min surface water area (km²)– (Dec-Jan-Feb)

Winter max surface water area (km²) – (Jun-Jul-Aug)

Rebound Magnitude (difference between winter max and summer min)



Discussion

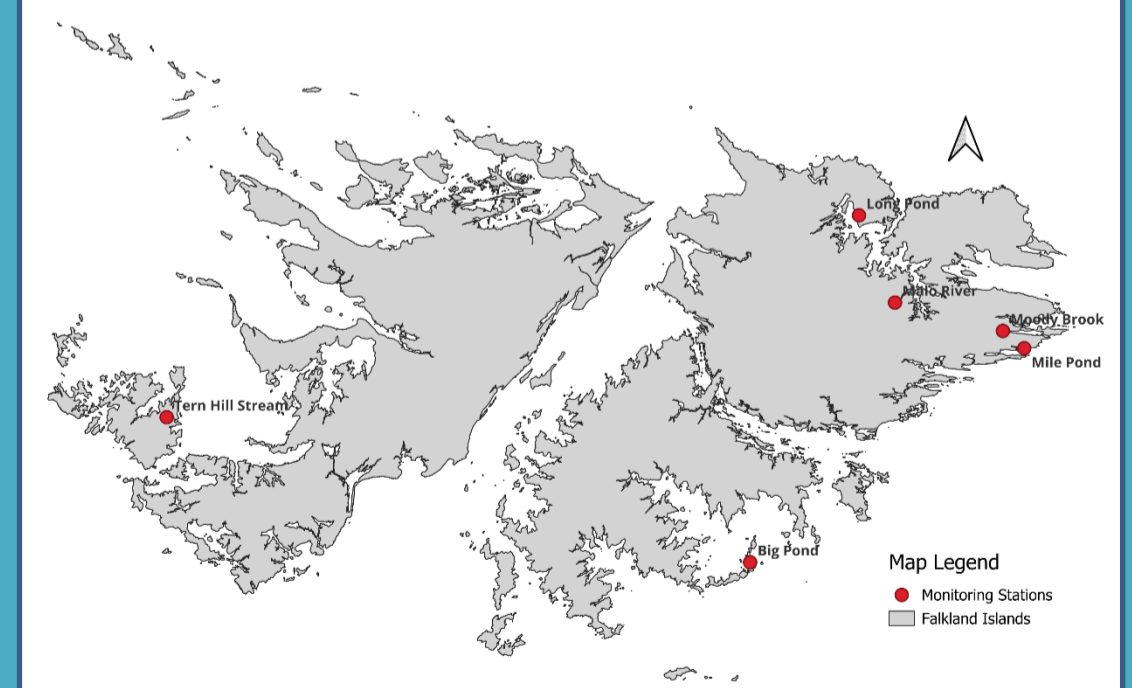
Hydroclimatic Sensitivity: East and West Falkland show contrasting trends; East Falkland has increased winter water retention, likely due to catchment or climate changes.

Rebound as an Indicator: The rebound metric (Winter Max – Summer Min) reveals seasonal water retention. East Falkland's rising rebound indicates greater seasonal variability, linked to precipitation or reservoir dynamics.

Ecological & Management Impact: Rebound trends may affect wetland species, agriculture, biodiversity, and water management.

Data Gaps & Future Work: Updated data post-2015 and climate info (precipitation, temperature) are essential to validate trends and distinguish climate from land-use effects.

Field Monitoring-Water Level



Reference

Tockner, Klement. "Freshwaters: global distribution, biodiversity, ecosystem services, and human pressures." Handbook of water resources management: Discourses, concepts and examples. Cham: Springer International Publishing, 2021. 489-501.

Qadri, H., & Bhat, R. A. (2020). The concerns for global sustainability of freshwater ecosystems. Fresh water pollution dynamics and remediation, 1-13.

Region	Mean Summer Min (km ²)	Mean Winter Max (km ²)	Mean Rebound (km ²)	Summer Trend (km ² /year)	Winter Trend (km ² /year)	Rebound Trend
East	10.85	28.31	17.45	-0.79 ↓	+0.16 ↑	+0.95 ↑
West	18.69	34.23	15.53	~0	-0.69 ↓	-0.69 ↓
Lafonia	5.90	17.76	11.86	-0.26 ↓	+0.17 ↑	+0.43 ↑