

# Significance of Peat Soil on Shallow Marine Communities in the Falkland Islands



Amy Guest a.guest.21@abdn.ac.uk

Supervisors: Prof. Stuart Piertney, Prof. Alex Douglas, Dr Paul Brickley



Figure 1: Study area Hummock Island, West Falkland



Figure 2: Typical vegetation vs eroded land

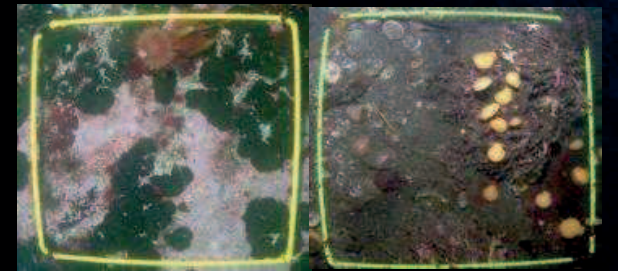


Figure 3: Typical seabed vs peat soil on seabed

## 1) Background

- In the Falkland Islands, natural wild fires and livestock overgrazing can cause a removal of the surface vegetation layer, exposing the underlying peat soil. This can be seen on Hummock Island (Fig 1, 2).
- In simplified terms, moisture in the exposed peat soil evaporates and the dry peat particles can be transferred to the surrounding coastal waters via wind or runoff, causing visible erosion (Fig 2).
- This causes a 'Coastal Darkening' effect, with unknown effects on the shallow marine community structure. Here I am investigating these effects on Hummock Island, West Falkland (Fig 3).

## 2) Aims

- The main question: *How does the eroded peat soil influence shallow marine invertebrate community structure on Hummock Island?*

## 3) Methods

- SCUBA surveys: Belt Transect Method and 0.25 m<sup>2</sup> quadrat photographs (Fig 3).
- 20 m length transects at 5-20m depths, across 18 stations.
- Peat was quantified as % cover per quadrat.
- Invertebrates were identified and counted per quadrat.

## 4) Results

- 18 stations were sampled, 11 had peat present – mostly in the East of Hummock Island, due to prevailing westerly winds.
- Quadrats with peat had a higher density of highly mobile species, and none to low densities of filter feeders.
- Species richness was higher in sites with no peat (Fig 4).
- Diversity in quadrats with and without peat were significantly different (Mann-Whitney test  $P < 0.0001$ ; Fig 5).

## 5) Discussion

- Marine invertebrates on Hummock Island are affected by eroded peat, in particularly sessile and filter feeding invertebrates.
- These findings have implications for wider, similar Falkland Islands shallow marine habitats, particularly with a trend of increasingly drier and windier climates, likely to increase levels of erosion in future years.

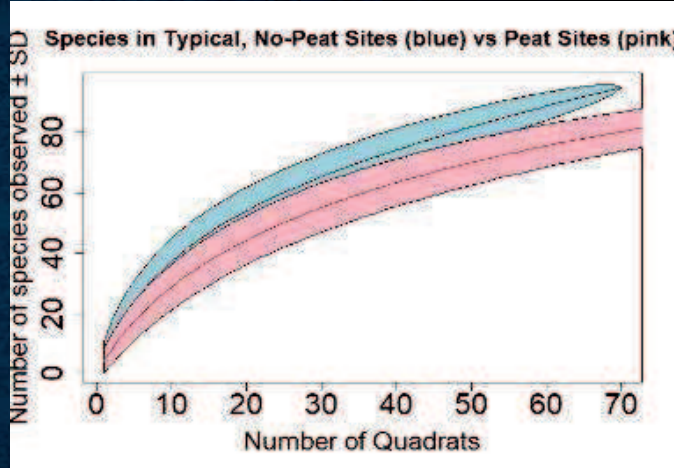


Figure 4: Species richness curves in peat (blue) vs no-peat (pink) sites - more species were found in peat-free sites

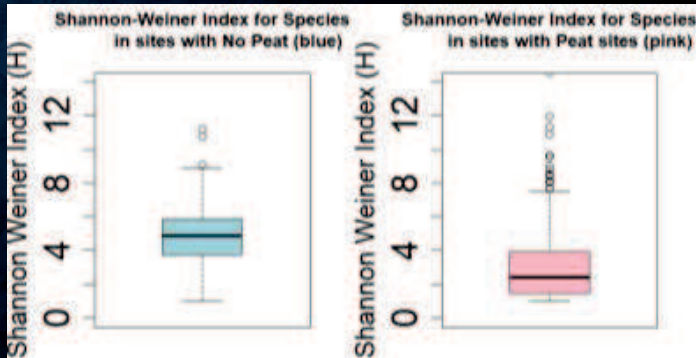


Figure 5: Shannon-Weiner Indices for species in sites with no peat (blue) vs sites with peat (pink) – no overlap in boxplots suggests more diversity in areas without peat