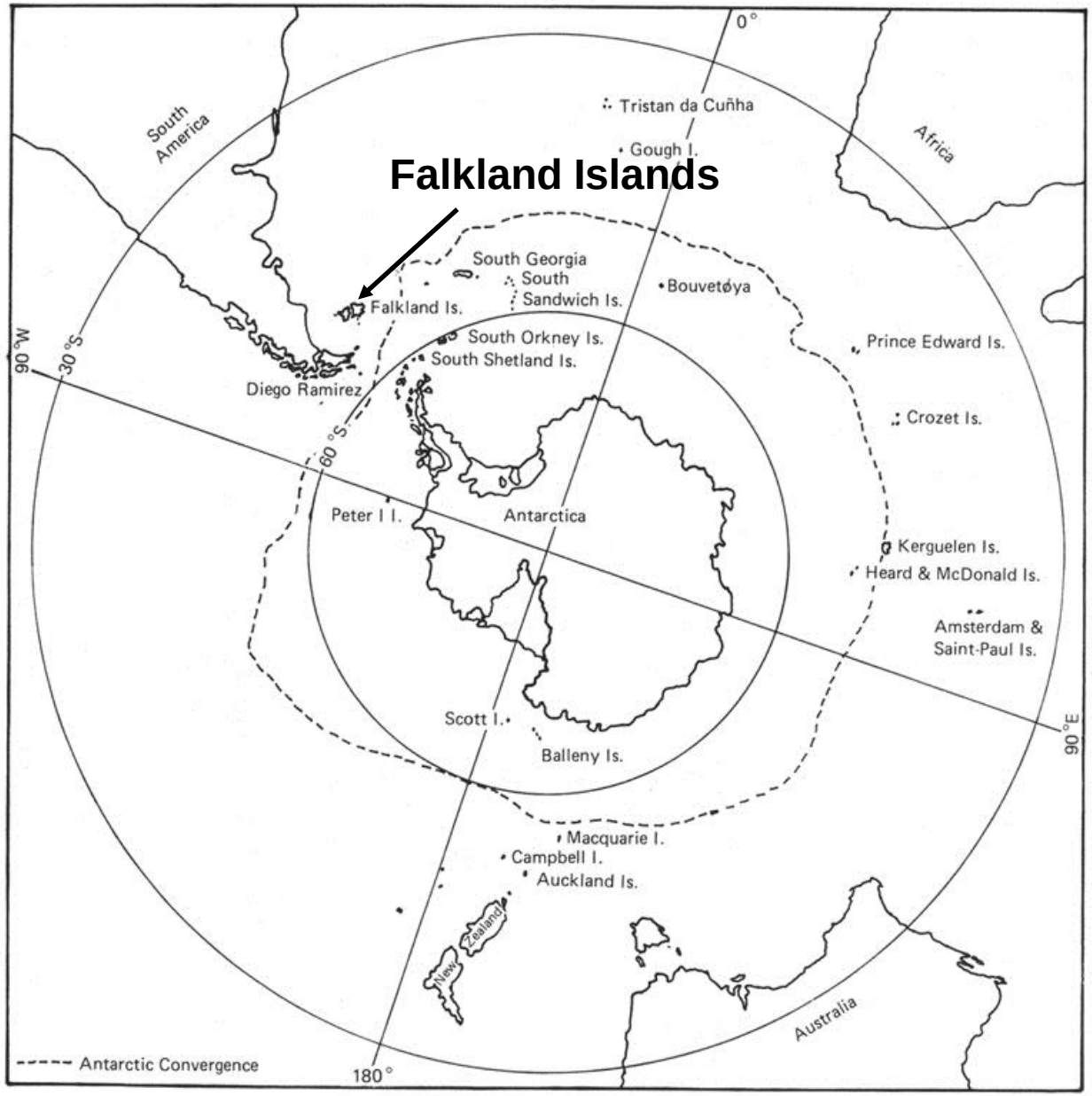
Peatlands in the Falkland Islands

Origins Status and Threats

Jim McAdam and Rebecca Upson

Falkland Islands Government

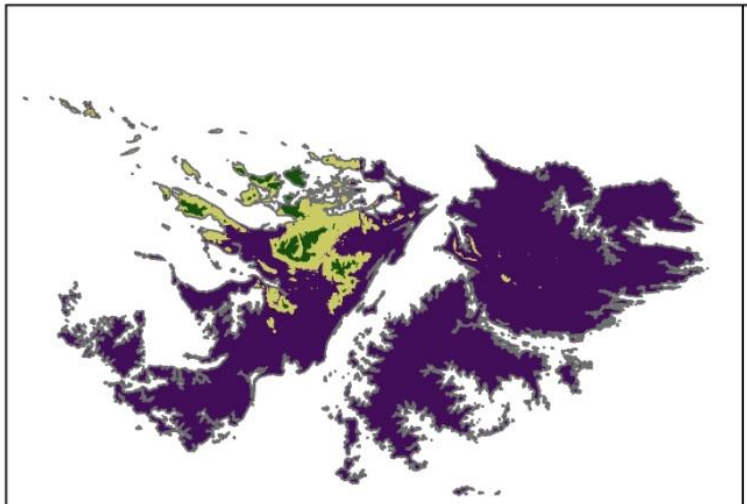
The islands and continents surrounding Antarctica and the Antarctic Convergence. (Author.)



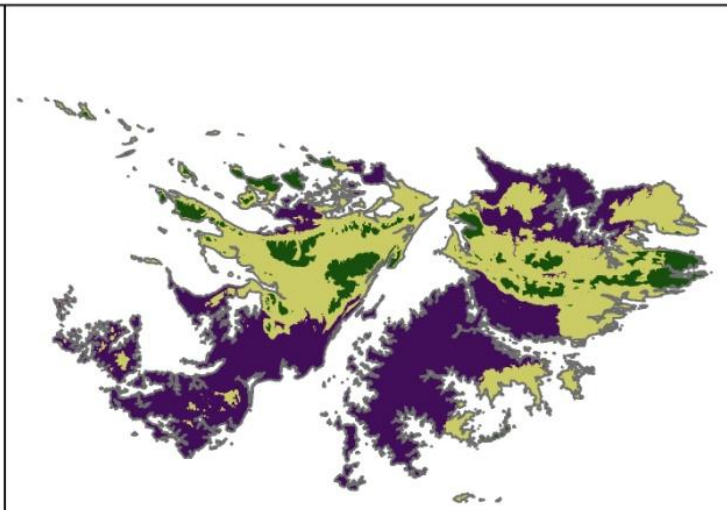

THE FALKLAND ISLANDS
Chile
Argentina
Atlantic Ocean
Falkland Islands
Jason Islands
Carcass Island
Saunders Island
Keppel Island
Pebble Island
Westpoint Island
Cape Dolphin
Douglas Station
Salvador
Rincon Grande
Johnson's Harbour
Port San Carlos
Port Louis
Volunteer Point
Berkeley Sound
Hill Cove
Roy Cove
Mt Adam 2297
PORT HOWARD
Bold Cove
FALKLAND SOUND
San Carlos
Teal Inlet
Mt Usborne 2312
STANLEY
Chartres
Dunnose Head
New Island
Mt Pleasant Airport
Bluff Cove
Fitzroy
Darwin
GOOSE GREEN
Beaver Island
Choiseul Sound
FOX BAY EAST
Fox Bay West
Weddell Island
Walker Creek
Lively Island
WEST FALKLAND
LAFONIA
EAST FALKLAND
Cape Orford
Port Stephens
North Arm
Speedwell Island
Bleaker Island
Cape Meredith
George Island
Barren Island
Bull Point
Sea Lion Island
1500
1000
500
0
Heights in feet above sea level
Area = 12, 170 km
same as Northern Ireland
Over 700 islands in the archipelago
Miles
0 10 20 30 40
0 10 20 30 40 50 60
Kms
Cartography by Jeremy G Smith

Climate

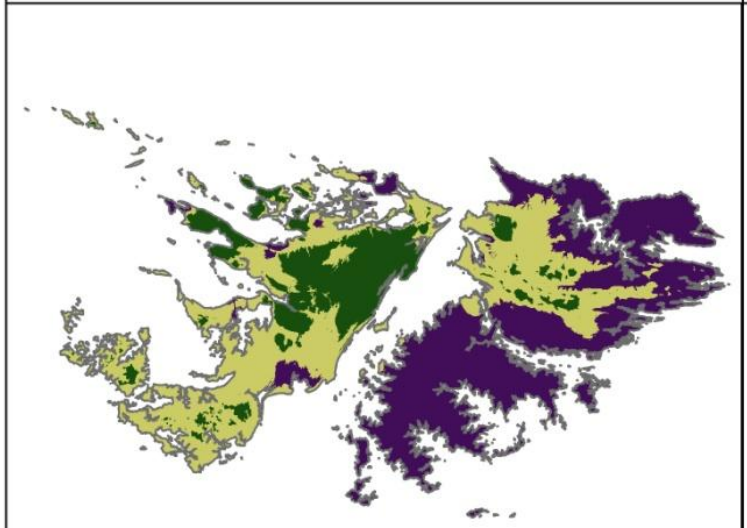
- **COOL**
  - Summer mean 9.4ºC, Winter mean 2.2ºC
- **WINDY**
  - Mean windspeed 8.5m/s, especially in spring
  - in October > 11m/s for 300 hours
- **DRY**
  - mean rainfall 412 – 640mm, with spring deficit



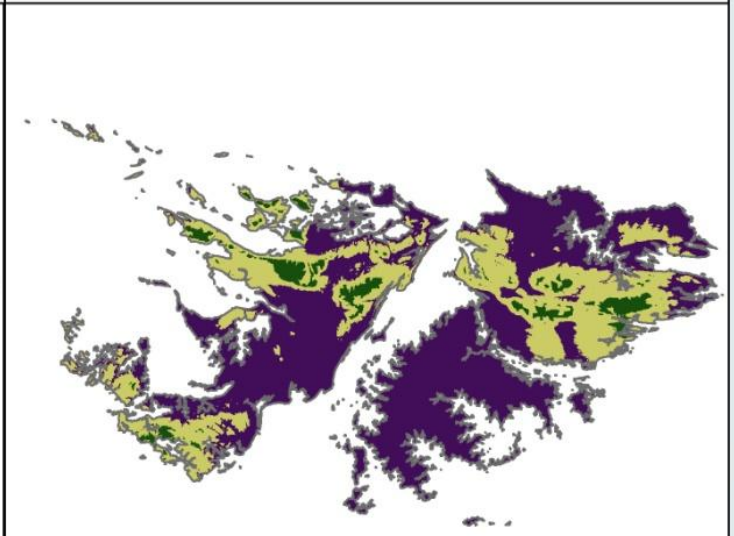
Spring



Summer



Autumn



Winter

United Kingdom Falkland Islands Trust & Shackleton Scholarship Fund

UKFIT Climate Study

Seasonal Rainfall

Legend

Seasonal Total mm

- 0 - 150
- 150 - 200
- 200 - 565

N

0 20 40 80 km

Print Date: 11 Jan 2012
Author: T McAdam

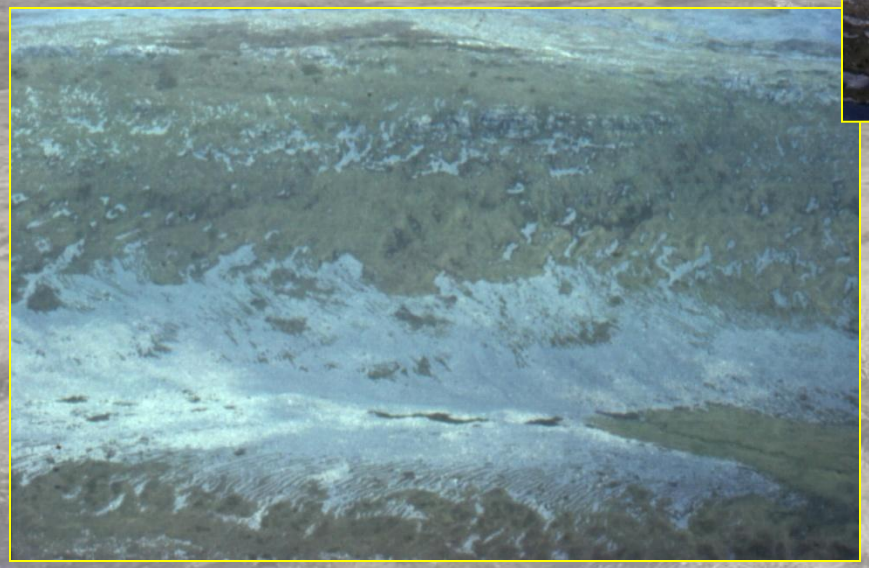
Landscape

- Rolling hills, moorland
- No trees, very indented coastline

- Highest mountain 705 m

Geology and Soils

- Quartzite, tillite, sandstones, shales, stone runs



- Soils – shallow, acid (pH 4-5), infertile, undeveloped

Vegetation

- Relatively uniform, Oceanic heath
- Mainly acid grassland dominated by *Cortaderia pilosa* and dwarf shrub oceanic heath dominated by *Empetrum rubrum*

Land Use

- Low population impact
  - most people (2400) live in the only town
- Rural population 500
- Extensive sheep farming for wool

- Rural roads programme has ‘opened up’ the countryside

Peatlands in the Falkland Islands

- **Definition of peatlands (IUCN) "Peatlands are areas of land with a naturally accumulated layer of peat, formed from carbon-rich dead and decaying plant material under water-logged conditions."**

- **Climate is very dry for peat?-*earlier wet period? low temperatures?***

- **Most Falkland soils have a fibric surface horizon (>20% Organic C in upper layers). pH 4-5**

- **"All soils have been subject to a long period of chemical weathering which makes geological differences in soils virtually zero"**

Falkland peatlands

Permanently water-logged:

- Cushion - bryophyte bogs

Permanently or temporarily waterlogged forming either peat soils or soils with varying organic content

- Graminoid
- Dwarf shrub heath
- Shrub

Cushion & bryophyte peatlands

- Bogs
  - Mat-forming cushion plant (*Astelia pumila*) usually dominates
  - Extent of *Sphagnum* (e.g. *S. magellanicum, S. fimbriatum*) usually restricted to small patches
  - Can form mosaic communities with graminoid peatland



Graminoid peatland habitats

- **Tussac**
  - ***Poa flabellata***

- **Acid grassland**

Graminoid peatland habitats (cont.)

- **Neutral grassland**
- **Marshy grassland**
  - **E.g. high proportion of *Carex***
- **Fen/ marginal**
  - **restricted**

Ground-water fed stretch of marshy grassland

Dwarf shrub peatland habitats

- Dwarf shrub heath
  - *Empetrum rubrum* usually dominates
  - in water-logged areas increase in rushes and Sphagnum

- Shrub

Peatland Occurrence (Km^2)

(from :- International Mire Conservation Group Global Peatland Database. 2010)

Country	Area-km2	Ranking	% Land Area	Ranking
UK	17,113	18	9.5	22
Falklands	11,408	26	93.7	1
Ireland	11,090	27	15.8	13
Chile	10,996	28		

Estimated Carbon Stocks (Mton C) 2008

UK	1745
Falklands	1151
Ireland	1130

CO_2 Emissions From Degraded Peatlands

Falkland Islands (1990 state)

Total Area	**12,173 Km^2**
Peatland Area	**11,500 Km^2**
Peat Carbon Stock	**11,150 Mt C**
Total Emissions	**1.1 Mt C/yr**

Nationally threatened species restricted to peatlands

- *Alopecurus magellanicus*
- *Carex banksii*
- *Carex macloviana*
- *Carex magellanica*
- *Carex sagei*

Threats to Falkland peatlands

- Overgrazing (decreasing soil water retention and promoting erosion)
- Fires (intentional and through lightning strikes)
- Drainage alteration

Threats to Falkland peatlands

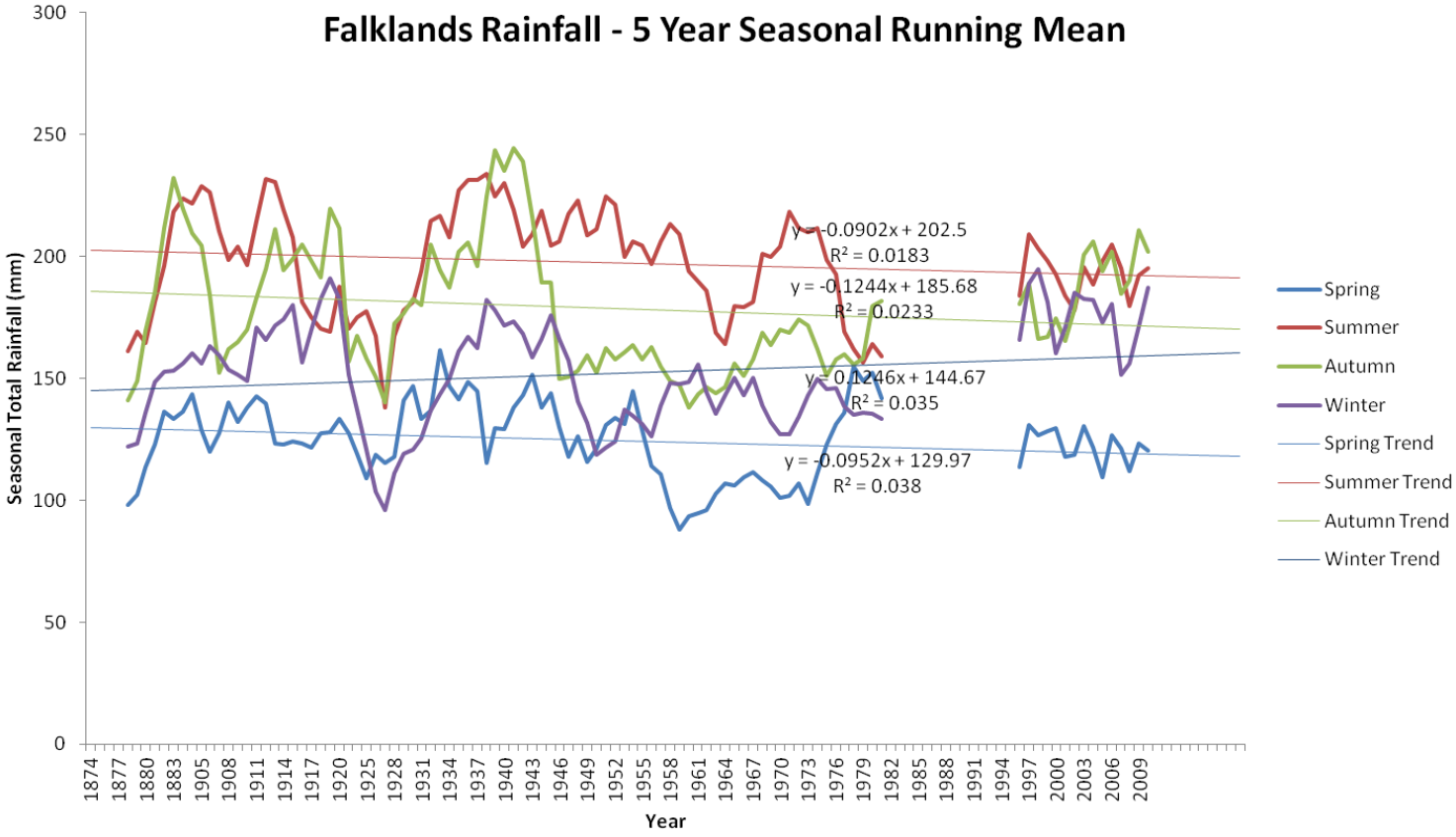
- Loss through e.g. development, reseeding
- Water extraction

Threats to Falkland peatlands

- Invasive plant species overgrowing native vegetation
- Species currently posing the highest threat:
  - *Berberis microphylla*
  - *Ulex europaeus*
  - *Cirsium arvense*
  - *Cirsium vulgare*
  - *Pilosella officinarum*

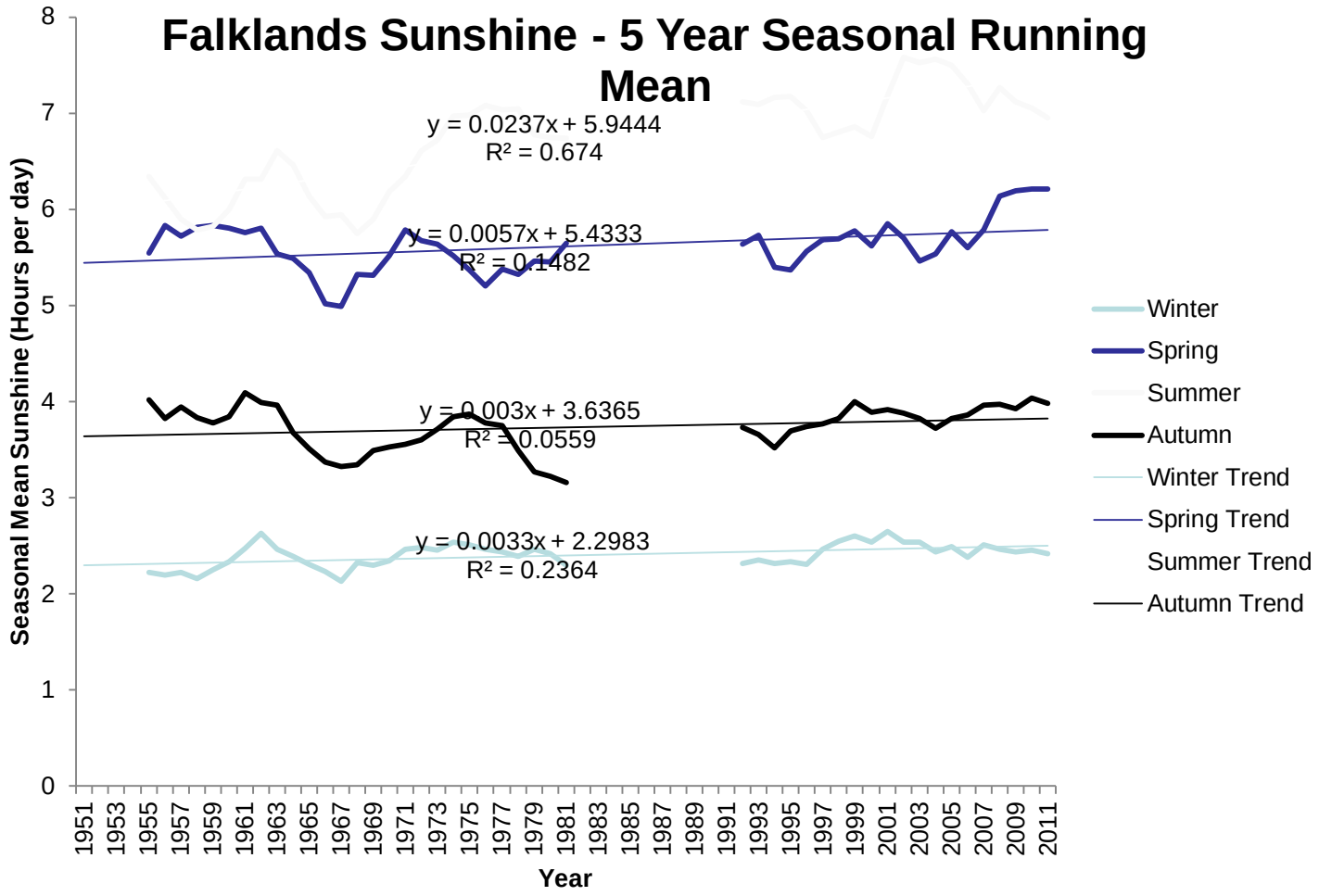
Threats to Falkland peatlands

- Climate change
  - Overall rainfall is decreasing



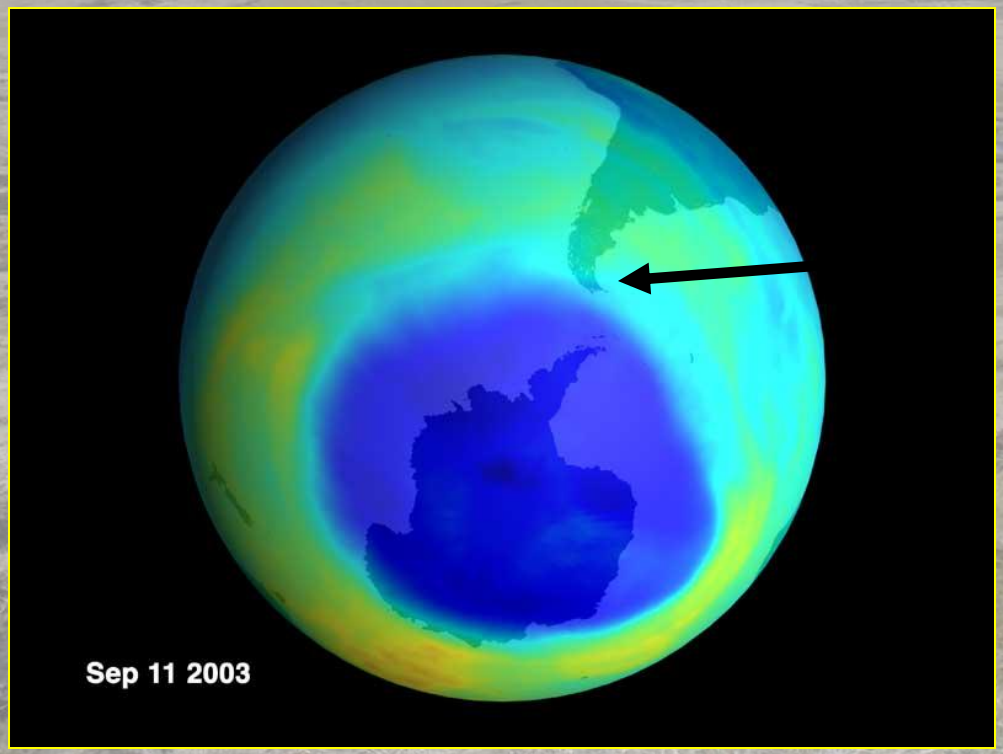
Threats to Falkland peatlands

- Climate change
  - Summer sunshine is increasing (substantially)



Threats to Falkland peatlands

- Climate change
  - Spring and summer temperatures are increasing
  - Seasonal upper atmosphere ozone depletion



Action

- Agriculture
  - Grazing control
  - EIA for reseeding proposals
  - Agri-environment scheme introduction?
- Development
- Regulation
- Research
  - Surveys to audit peatlands
  - Climate change impacts (EU-BEST)
  - Re-vegetation techniques (Darwin Initiative project)

For further information contact:-

Jim.mcadam@afbini.gov.uk
R.Upson@kew.org