



UCD Earth Institute
Better understand today's world.
Inform solutions for tomorrow.

Expect the Unexpected!

Will *Gunnera tinctoria* Invade European Coastal Dune Systems??????

Bruce Osborne

UCD School of Agriculture and Food Science

University College Dublin

Belfield

Dublin 4

Ireland

Bruce.Osborne@ucd.ie

Sand Dunes: Chiloe Island, Chile

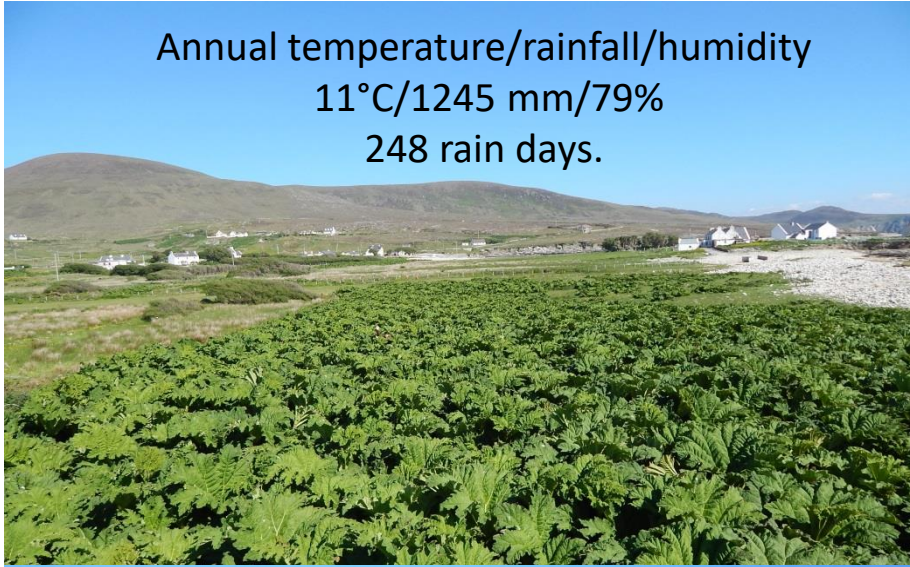




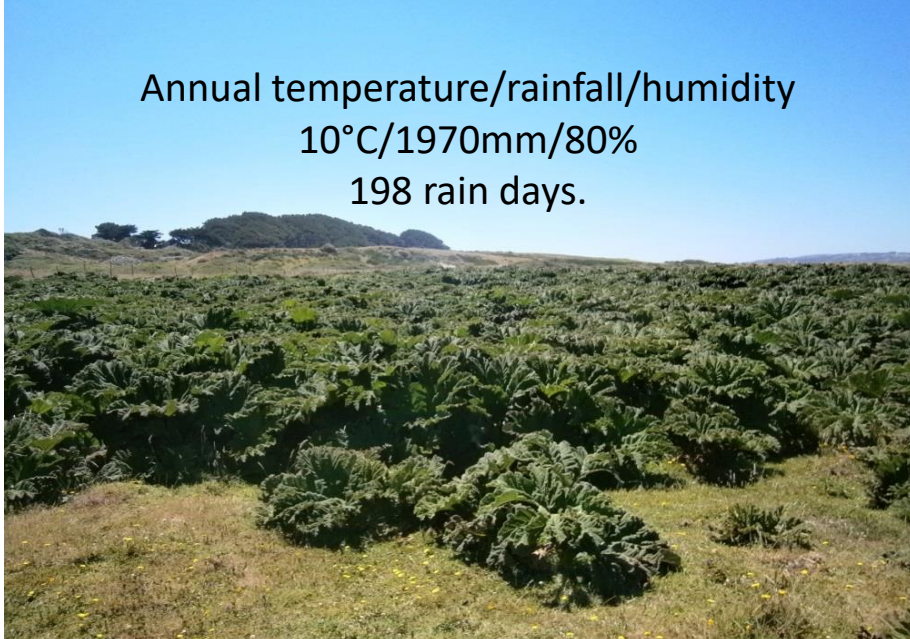


Comparable Habitats-Chile/Ireland

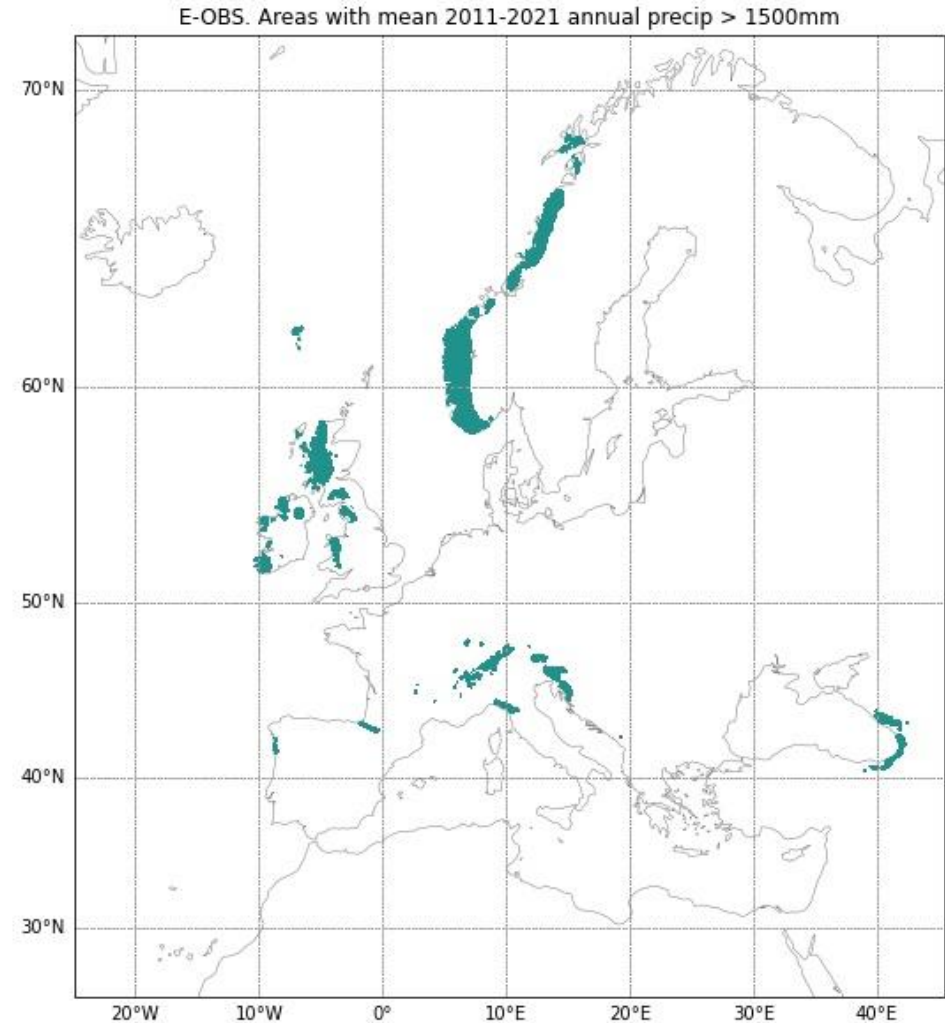
Annual temperature/rainfall/humidity
11°C/1245 mm/79%
248 rain days.



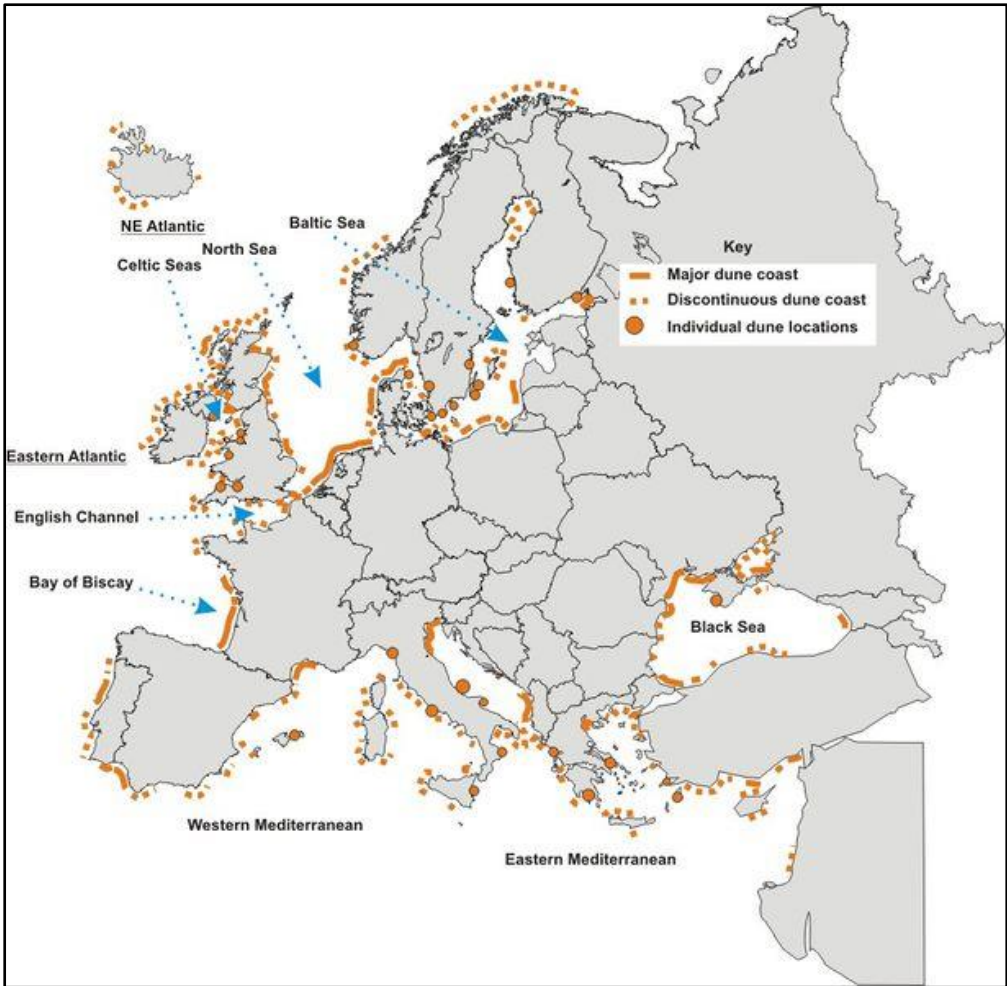
Annual temperature/rainfall/humidity
10°C/1970mm/80%
198 rain days.



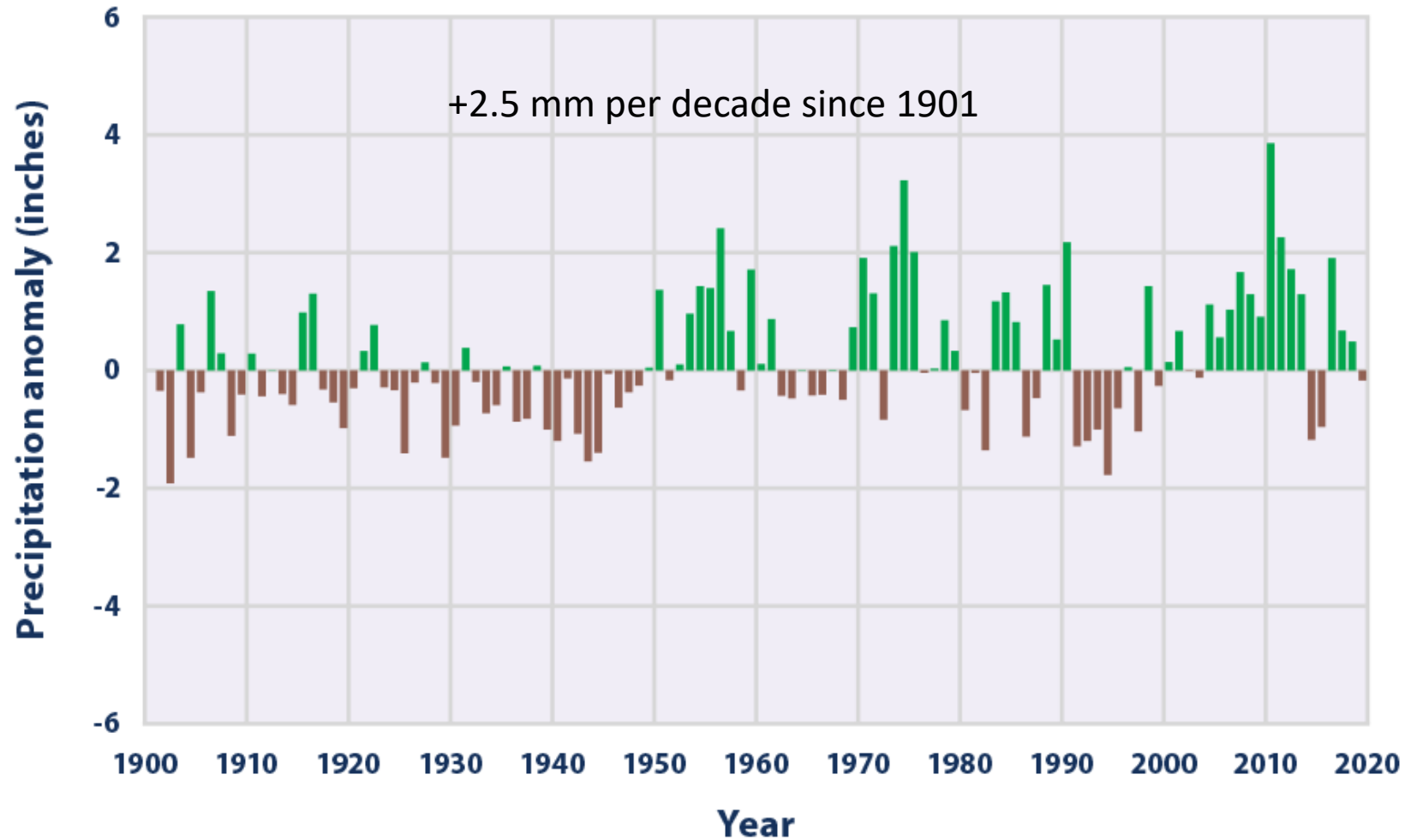
Areas with > 1500 mm annual rainfall:
Conor Sweeney



Sand Dune Distribution
Pat Doody: Coastal Wiki



Change in Global Precipitation



Gunnera tinctoria Populations





MER

HER



Post Invasion Recovery

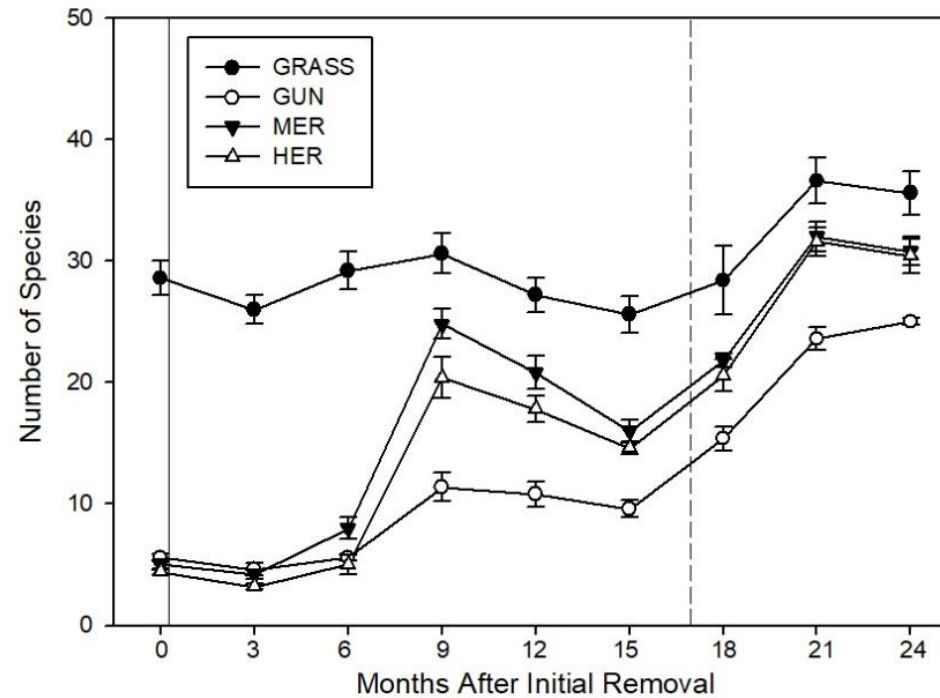


Figure 1. – Time course of changes in the number of species per plot after the physical removal of mature *G. tinctoria* plants or the application of herbicide on Achill Island, Co. Mayo, Ireland (n = 5; mean ± SE). Legend: GRASS, uninvaded semi-natural grasslands; GUN, areas invaded by *G. tinctoria*; MER, mechanical removal; and HER, herbicide (glyphosate) application. Note: the solid-line represents the initial removal, performed in invaded areas on 29th of September 2016, and the dashed-line represents the occurrence of the extreme weather event called Storm Emma, at the end of February and beginning of March 2018.

Post Invasion Recovery

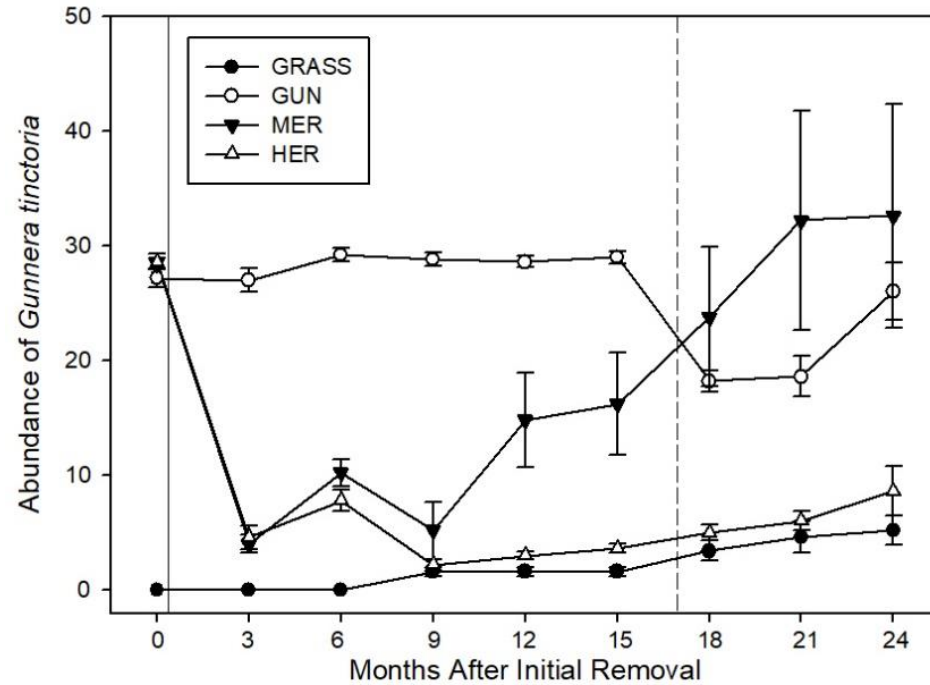


Figure 2. – Time course of the number of mature *G. tinctoria* plants and their seedlings per plot after the physical removal of mature plants or the application of herbicide ($n = 5$; mean \pm SE), on Achill Island, Co. Mayo, Ireland. Legend: GRASS, uninvaded semi-natural grasslands; GUN, areas invaded by *G. tinctoria*; MER, mechanical removal; and HER, herbicide (glyphosate) application. Note: the solid-line represents the initial removal, performed in invaded areas on 29th of September 2016, and the dashed-line represents the extreme weather event called Storm Emma, at the end of February and beginning of March 2018.