

The Impact of Coastal Flooding on Agricultural Land



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Update on the University of Lincoln RIF Project

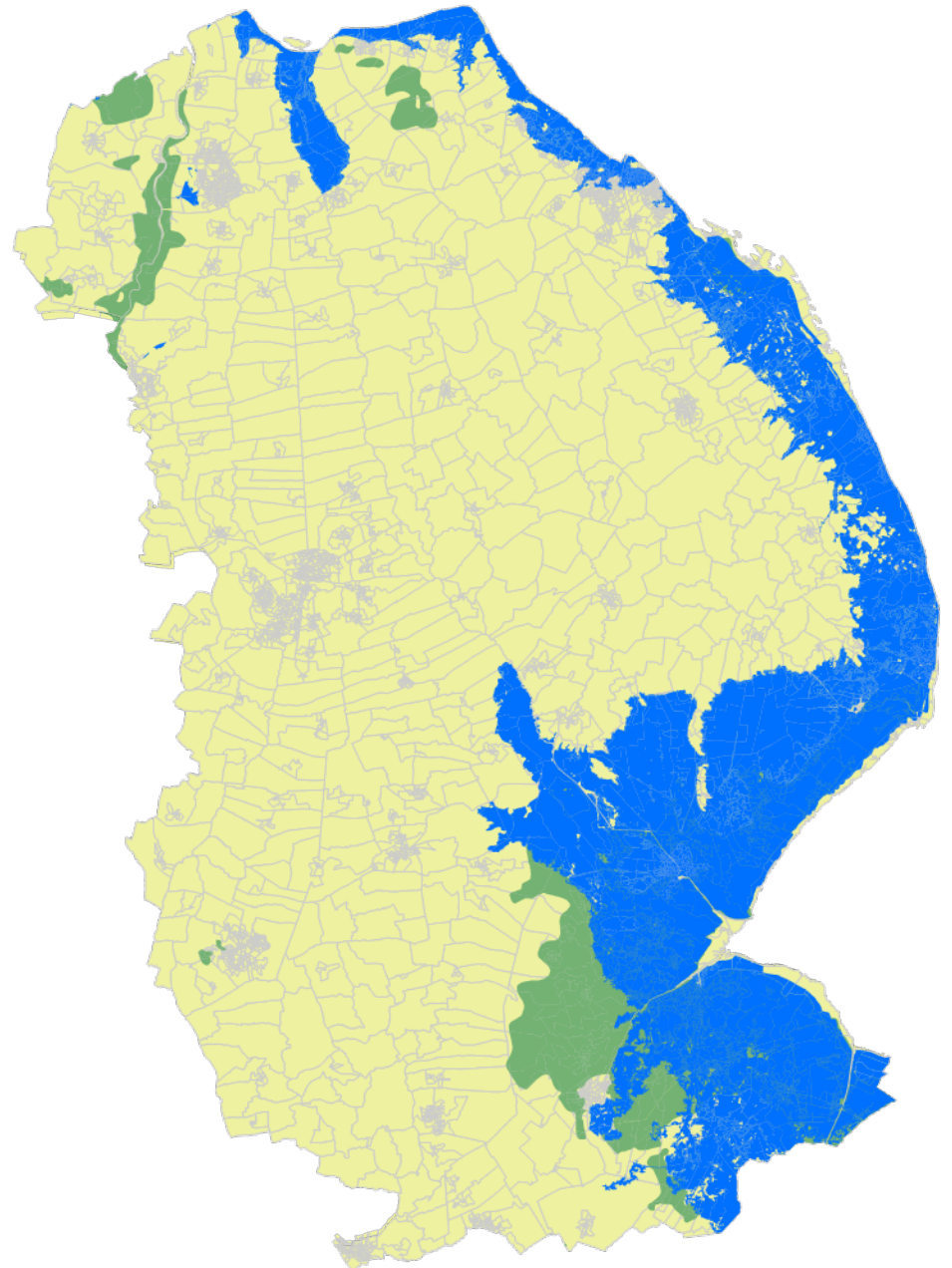
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Lincoln Institute for Agri-Food Technology (LIAT)

Local Importance

Lincolnshire has **24%** of England's Grade 1 Agricultural Land so the economic risk is even more acute.

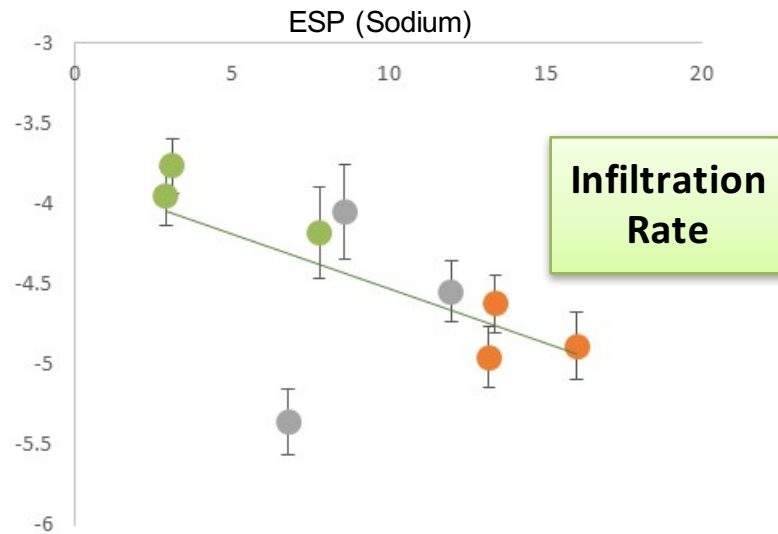
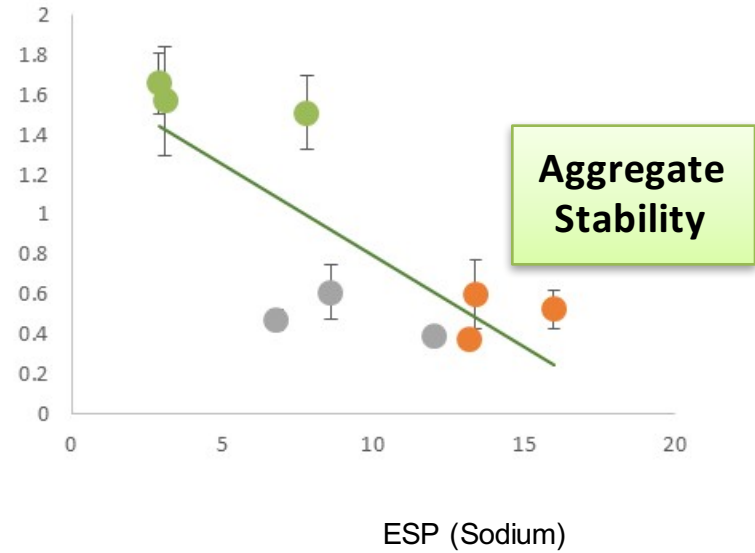
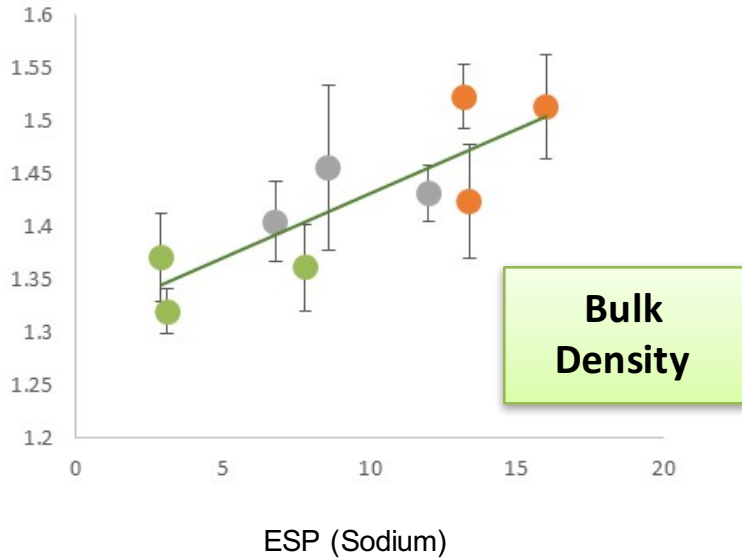
Spatial analysis reveals that nearly two-thirds (**63%**) of the county's Grade 1 land is in EA's Flood Zone 3.



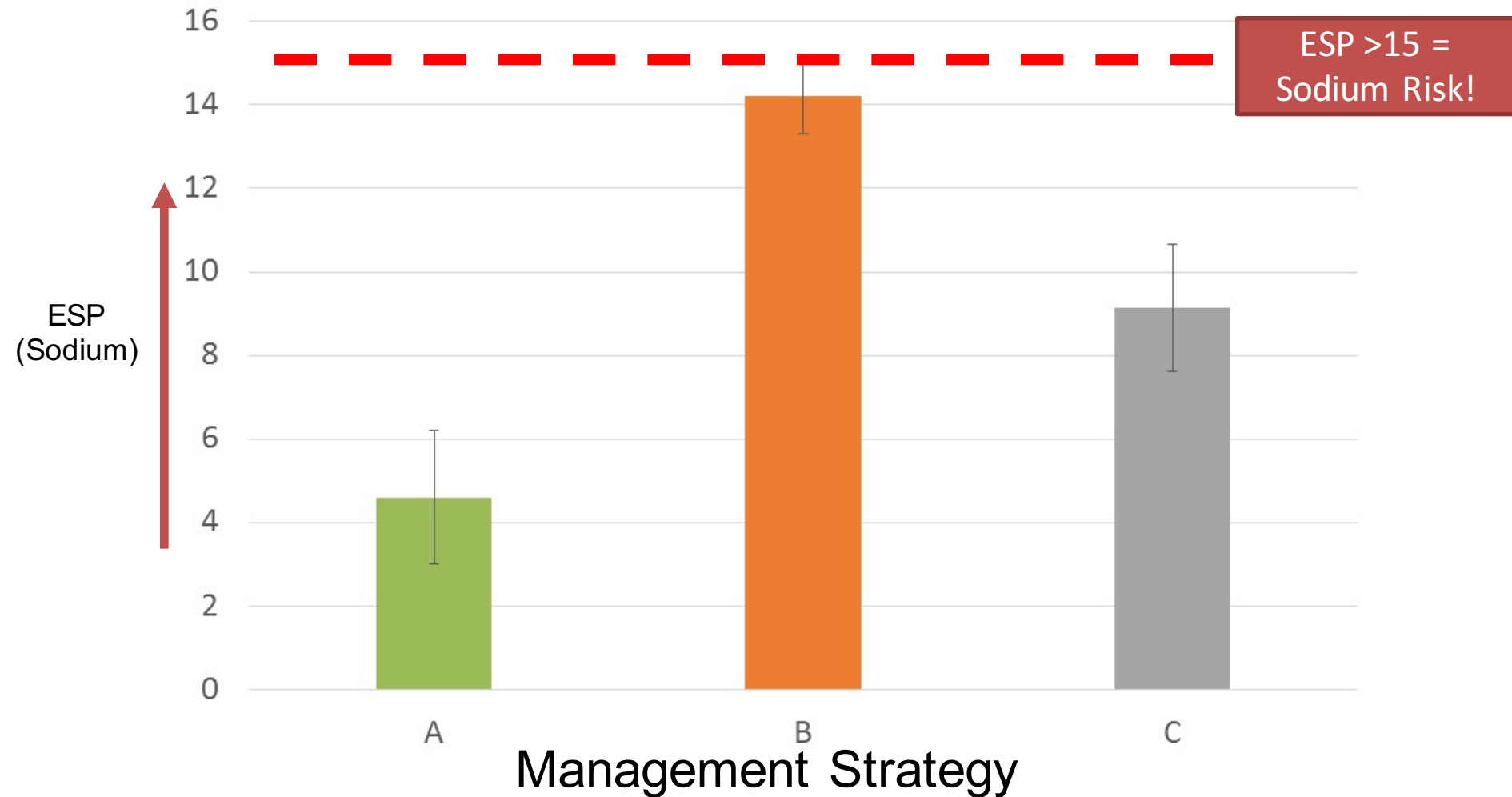
Saltwater Flooding

- Brings in Salts, Sediments, Trash
- More long term damage than freshwater flood
- Sodium (Na) disrupts plant growth and is detrimental to soil structure
- We want to see how different post-flood management practices can reduce sodium levels over time

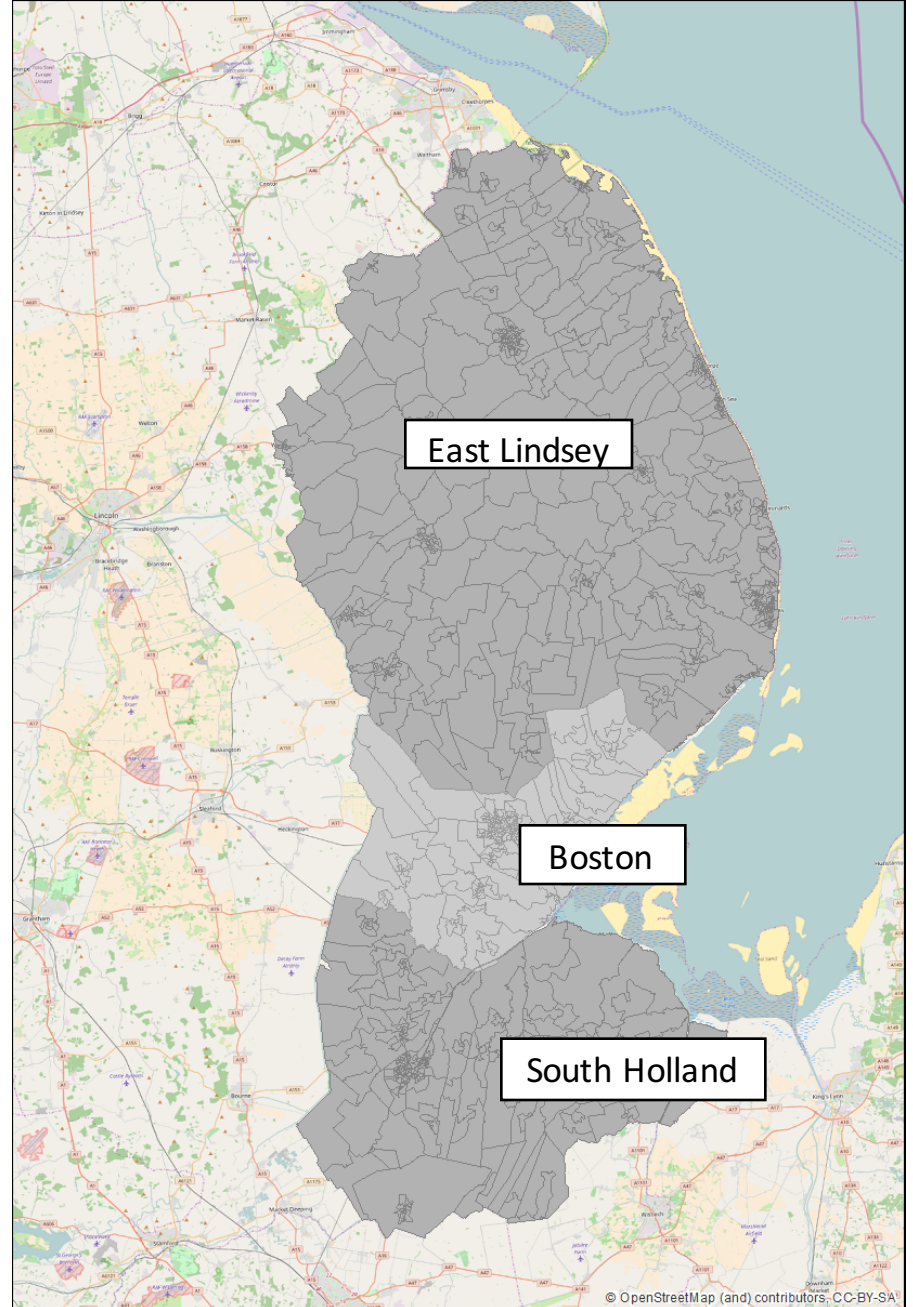
Sodium has a negative effect on soil structure



3 years after a flood, management can significantly reduce the sodium levels

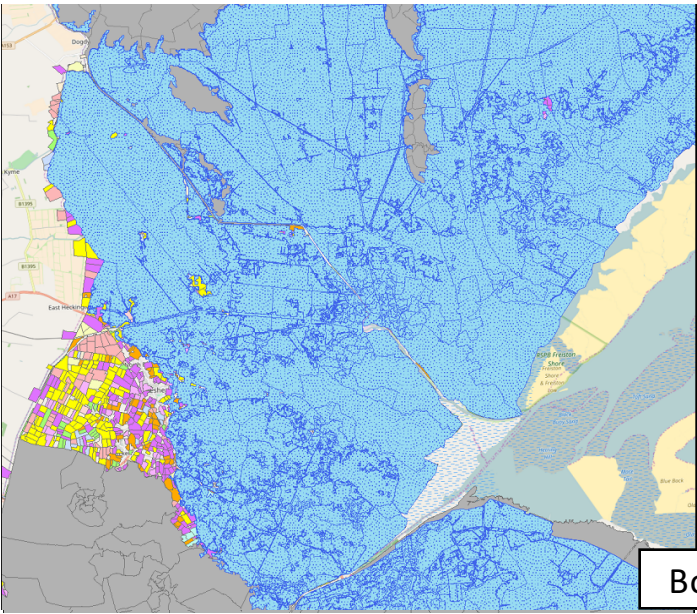
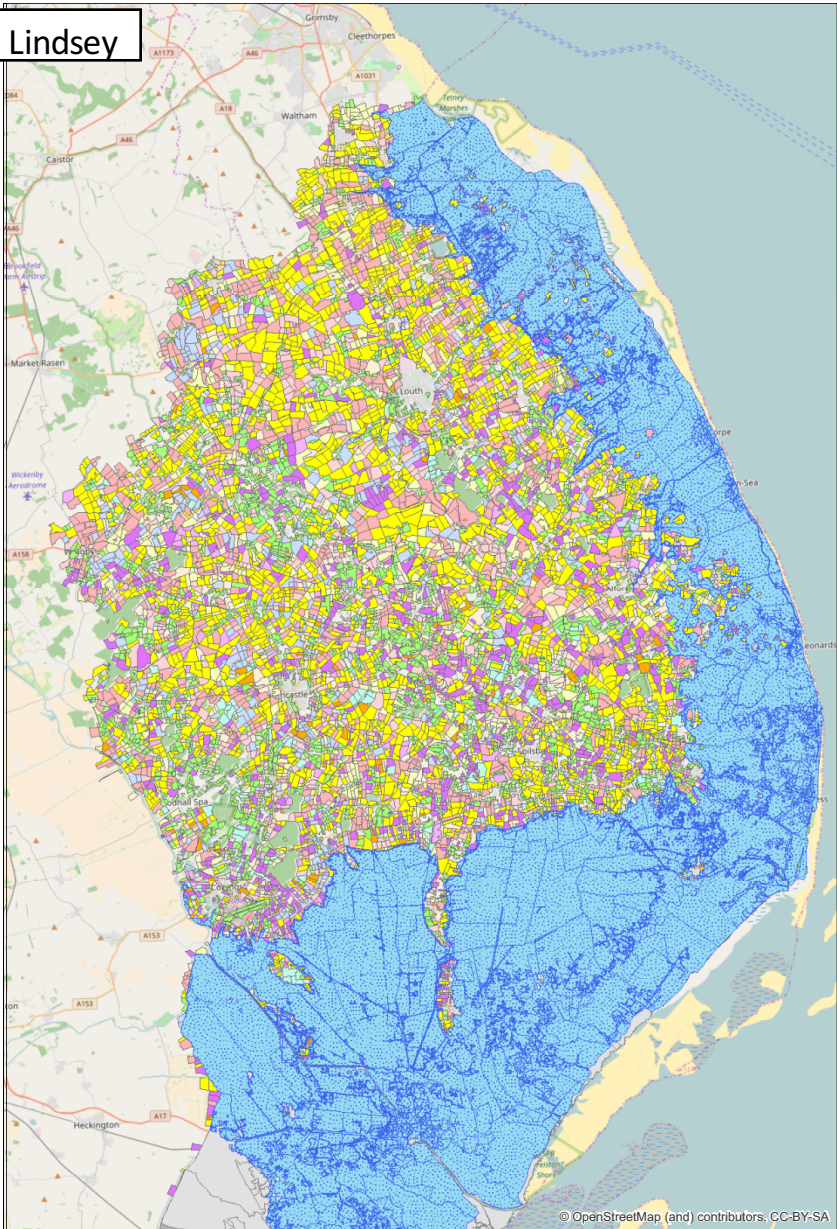


Flood Scenario 1: Flood Zone 3



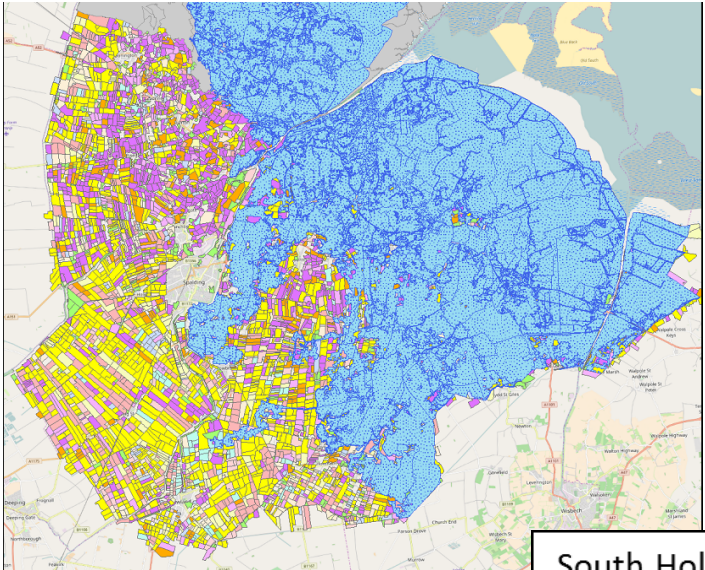
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East Lindsey



Boston

- be
- fb
- gr
- ma
- or
- ot
- po
- sb
- sw
- wb
- ww



South Holland

Crops most affected under this scenario....

East Lindsey

49% of the district's vegetables
16,000 ha of wheat affected

Boston

95 % of the district's spring wheat
>8,000 ha of Veg affected

South Holland

57-59 % of the district's vegetables and potatoes
>10,000 ha of Winter Wheat

Flood Scenario 1: Flood Zone 3

If the salt impacts are long term (depreciation over 7 years)...

In this scenario

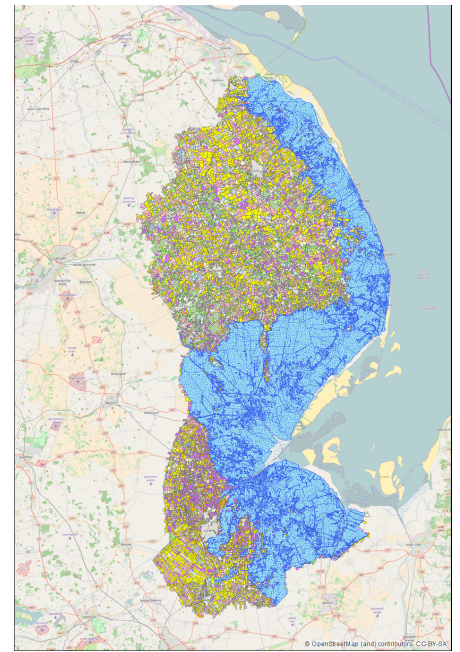
~ **2 million tonnes** of crop (all) at risk in the first year

After 7 years, the region would have lost out on...

1.2 million tonnes of wheat,

Nearly **1 million tonnes** of potatoes

1 million tonnes of veg

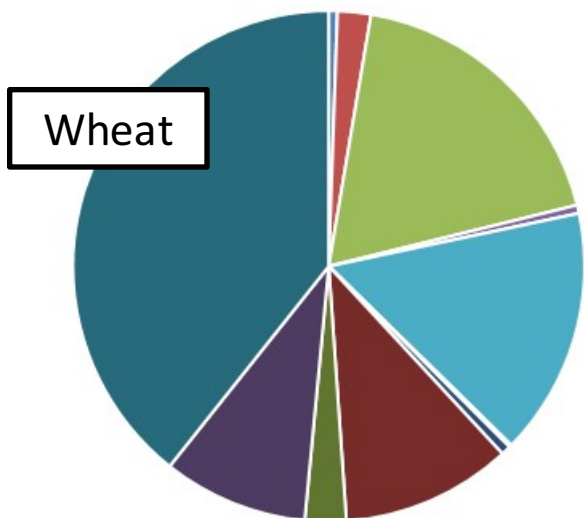


Flood Scenario 2: Breaches

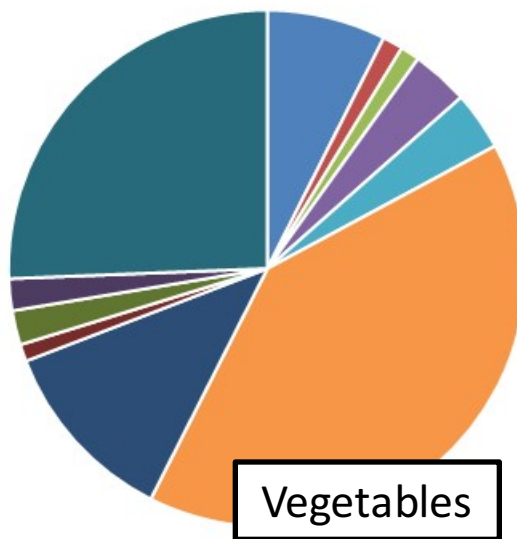
Flood Scenario 2: Breaches

Crops most affected by a breach in...

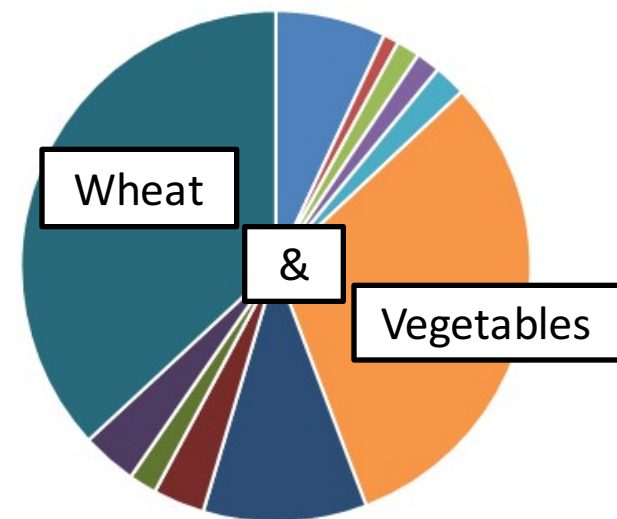
East Lindsey



Boston



South Holland



(% of each simulated breach area taken up by crop type)



Flood Scenario 1: Flood Zone 3

If the salt effects are long term

Total crops lost range from **66,000 tonnes** to **130,000 tonnes** in the flood year

After 7 years, the most sever of our 3 breaches could have impacted:

120,000 tonnes of potatoes

80,000 tonnes of wheat

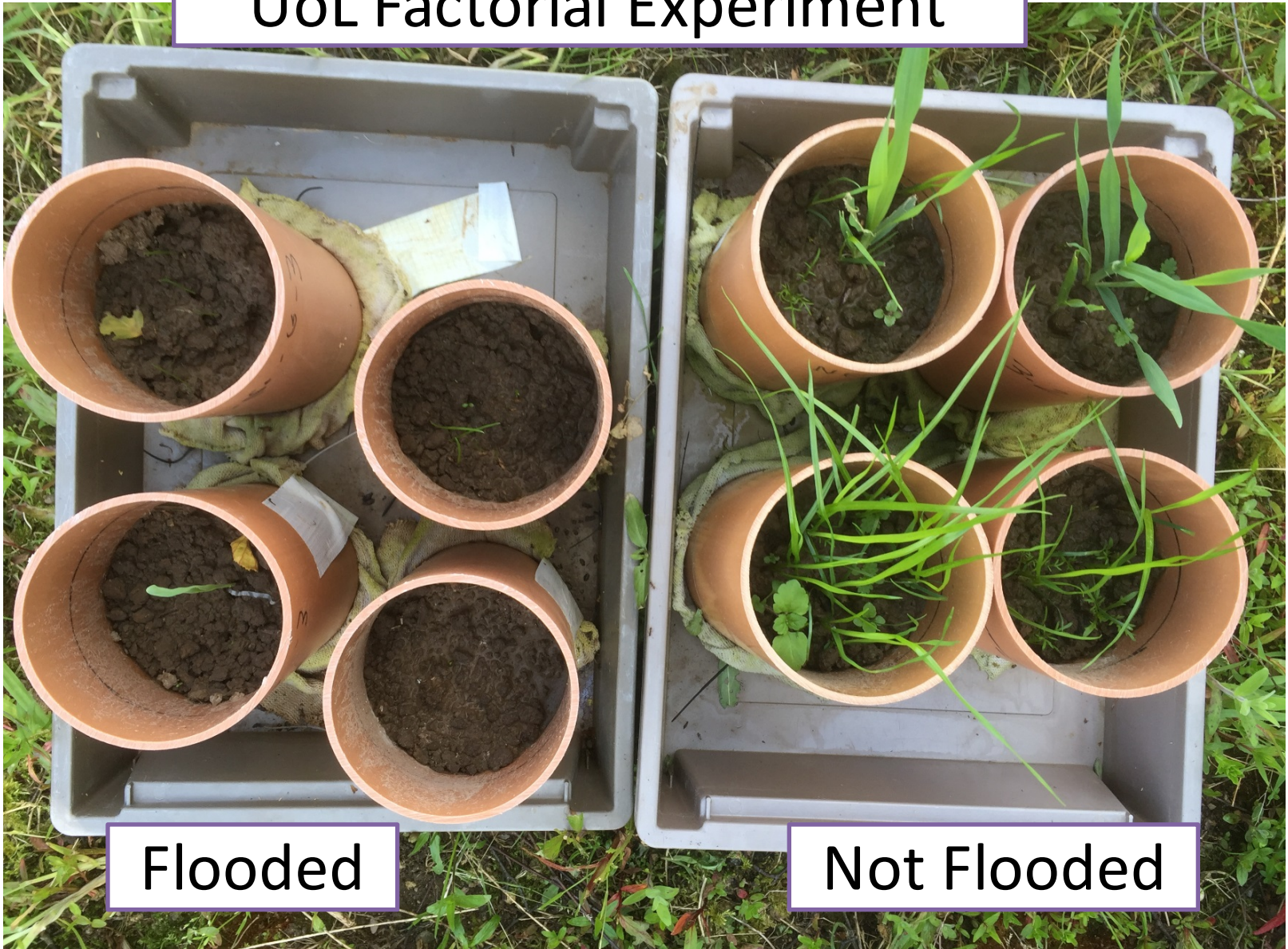
Summary

- Salts degrade soil structure, and remain in the soil over several years
- Changing land management can speed up the recovery of soils
- In our region, vegetable production (as a proportion) and wheat (as a total) are most at risk
- Beyond the financial losses, over time it may have consequences for Food Security

Thank You

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UoL Factorial Experiment



Flooded

Not Flooded



No gypsum – poor soil structure and drainage potential, limited crop rooting capacity

Gypsum applied to soil – visibly better soil structure, increased drainage potential and good crop rooting capacity

