



Research User Perspective: Shaping Agriculture & Climate Change Policy

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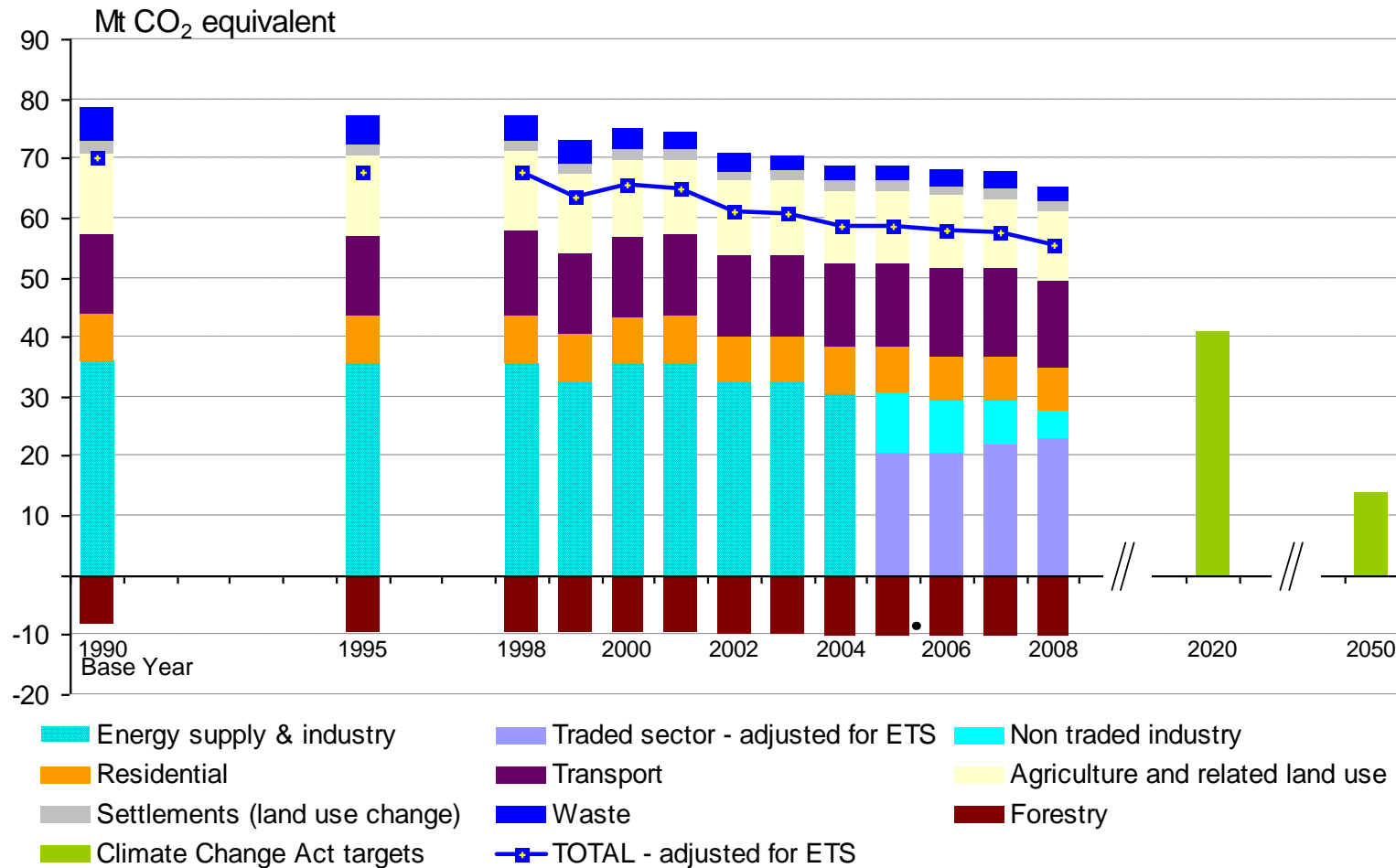
Climate Change (Scotland) Act 2009: A strategic opportunity?



- Act passed unanimously
- Act requires CO₂e reductions
 - 42% by 2020
 - 80% by 2050
- Annual targets
- Limited credit purchases



Emissions in 2008 were 21% below 1990



Adjusted Scottish net greenhouse gas emissions, 1990 - 2008, and 2020 and 2050 targets

The Report on Proposals and Policies March 2011

Low Carbon Scotland: Meeting the Emissions Reduction Targets 2010-2022.

- **Fulfils duty by Climate Change (Scotland) Act 2009 to lay before the Scottish Parliament a Report on Proposals and Policies setting out specific measures for reducing greenhouse gas emissions to meet Scotland's ambitious statutory targets**
- **Not a just a *Carbon Reduction* plan - but a *Low Carbon Future* project**

<http://www.scotland.gov.uk/Topics/Environment/climatechange/scotlands-action/lowcarbon/rpp>



Farming For A Better Climate

www.farmingforabetterclimate.org

Causes

Read about the causes of Climate Change and assess the evidence for yourself

Impacts

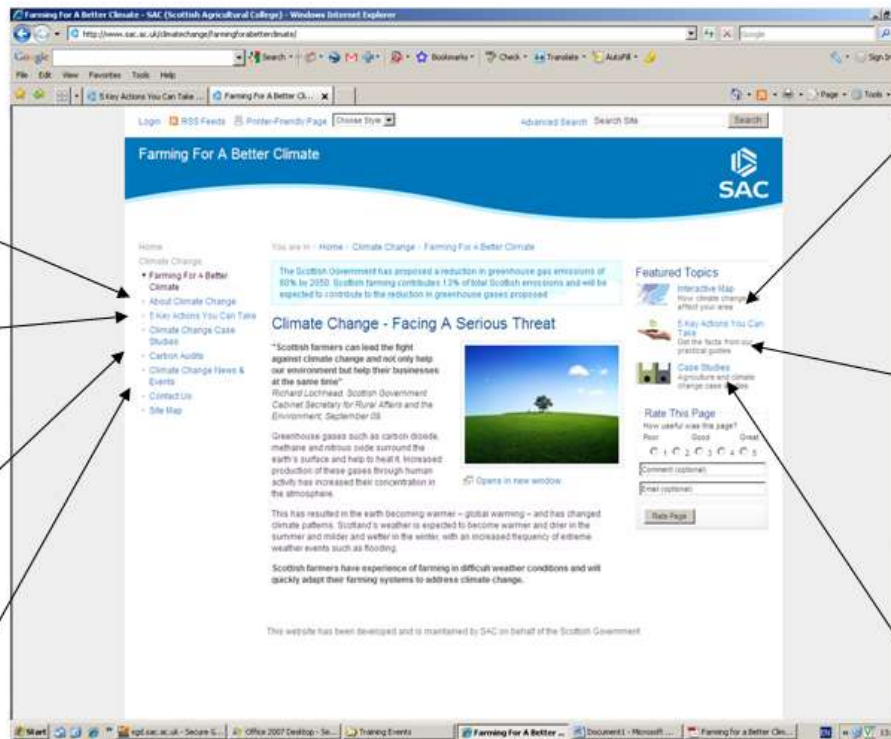
Sector-by-sector impact analyses for Scottish agriculture

Actions

How and why Scottish agriculture can mitigate and adapt

News and Events

Keep up to date with meetings and new resources to help you



Interactive Map

See how Climate Change is predicted to impact where you live and farm

5 Key Areas

Learn about the key actions using the Practical Guides written by specialists in their fields

Case Studies

See real examples of how farmers in Scotland are reducing their business's Greenhouse Gas emissions **and** improving their efficiency

Farming For A Better Climate: 5 Key areas

1. Using energy and fuels efficiently
2. Developing renewable energy
3. Locking carbon into the soil and vegetation
4. Optimising the application of fertiliser and manures
5. Optimising livestock management and storage of waste

Financial savings are key! Focus on promoting 'Low Hanging Fruit'



Climate Change Focus Farms – Practical demonstration



Research currently being commissioned to:

- Improve the evidence base on emissions from and sequestration in carbon-rich soils
- Identify new opportunities to reduce emissions and enhance sequestration from rural land use
- Improve the cost-effectiveness of existing measures
- Identify options for land managers to adapt to future climate conditions
- Develop tools and technologies to improve the resource use efficiency of crops in the face of climatic changes
- Identify opportunities for delivering multiple benefits from land use through technologies and management practices



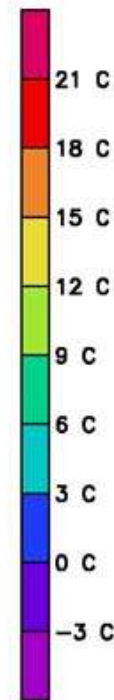
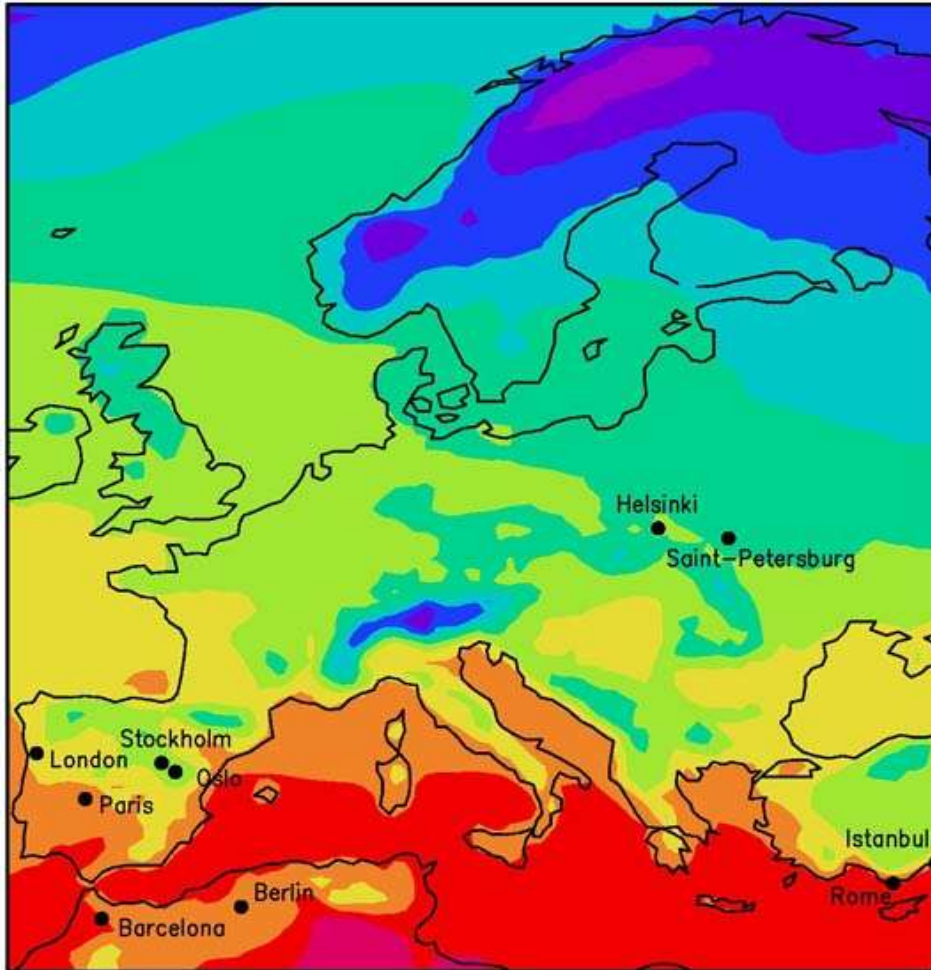
Ongoing involvement in work to improve the UK Greenhouse Gas Inventory, working with UK Government and DAs on:

- Improving the sources of data used**
- Developing methods which better reflect land management and policy actions to reduce emissions and sequester carbon**
- Carrying out the experimental science needed to generate robust data on Scottish/UK farming systems**



Security of the European Food Chain?

The climate map of Europe in 2080: high emissions scenario, based on temperature and aridity (but not rainfall)



The amount our climate could change is significant

Our natural environment is not adapted to the Climate of Southern Europe

This would mean significant changes to how we use land, and manage our water supply.

The affect on the more Southerly Countries will also effect us: trade and relations

International Centre for Research on the Environment and Development (France)
University of Bremen



R & D – what do we know about the future climate?

-Very confident about:

Increased Temperature, Longer growing season etc.

- Less Certain about Rainfall related changes

- Reasonably confident:

Soil moisture deficits will increase (esp. in East)

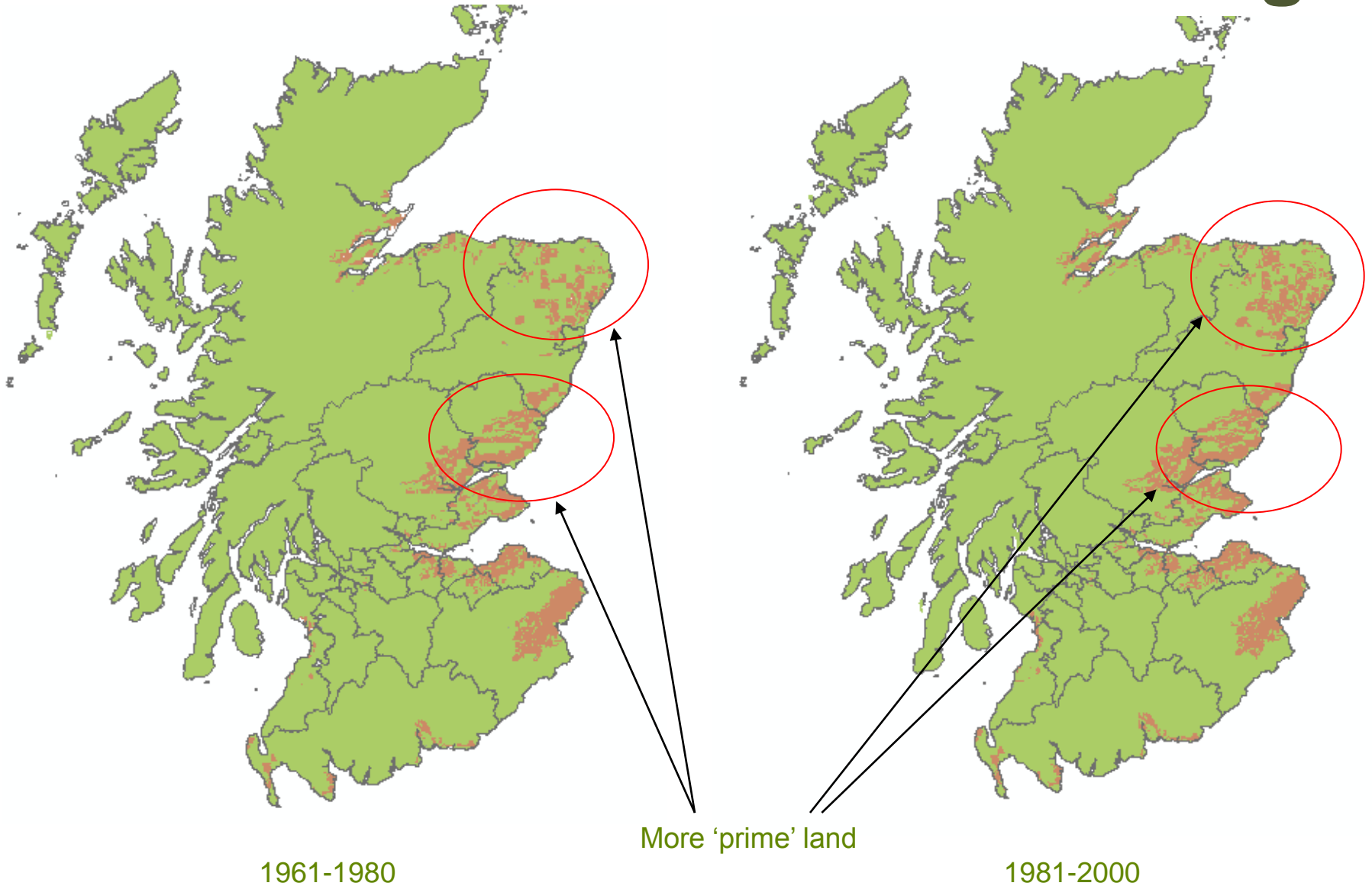
Much less certain about wind, storms etc.



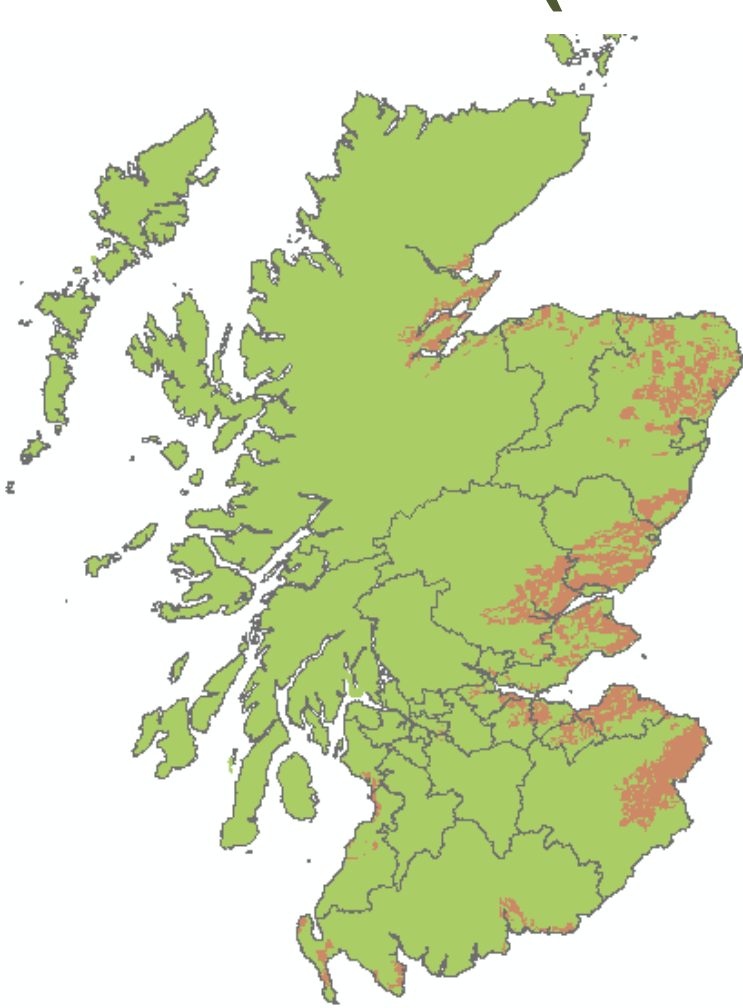
Impacts – Risk & Opportunities for Agriculture

- Water management
- New diseases/pests
- Wider range of crops/longer growing season
- More “better quality” land?
- Using agricultural land to meet other societal objectives

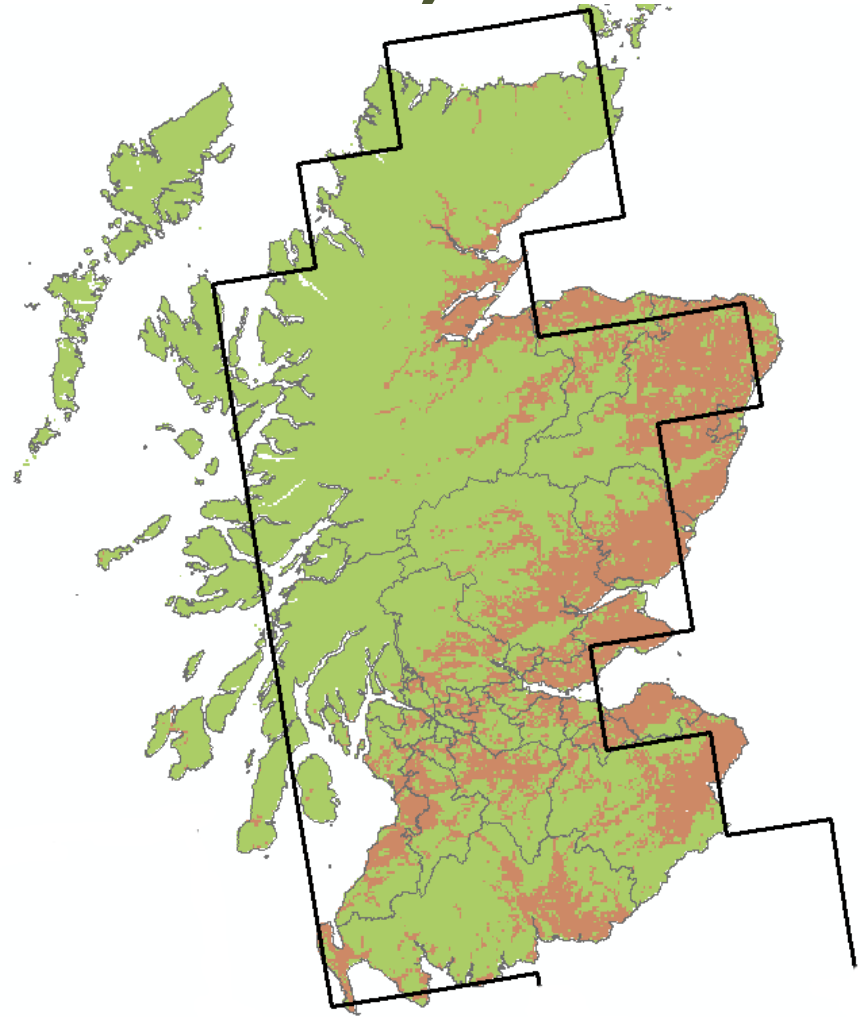
Results: Recent Climate Change



Results: Future Climate Change (Med-High Scenario)



1981-2000

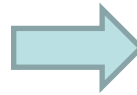
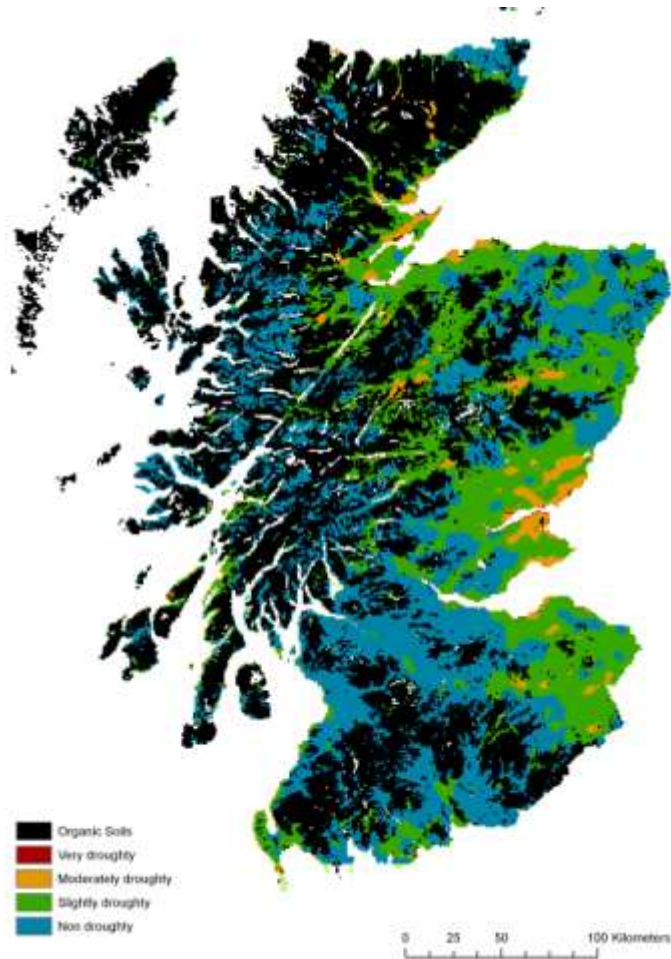


2050s – UKCIP02 Med High Emissions

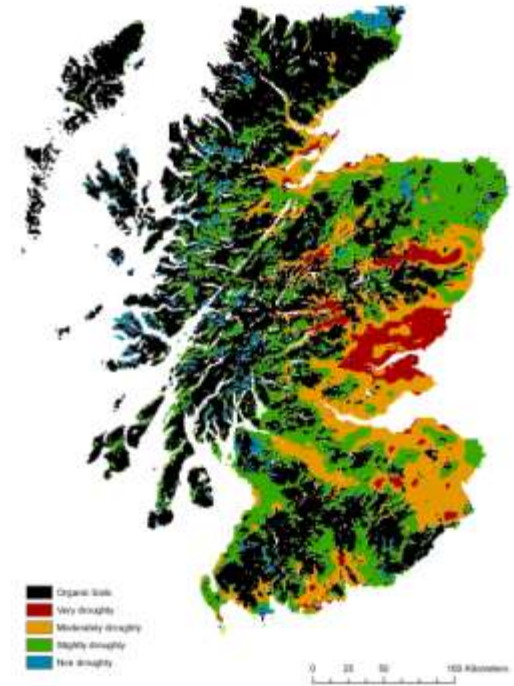
Potential large gains in Prime Land !

Soil- Climate interaction: Indicator crops –

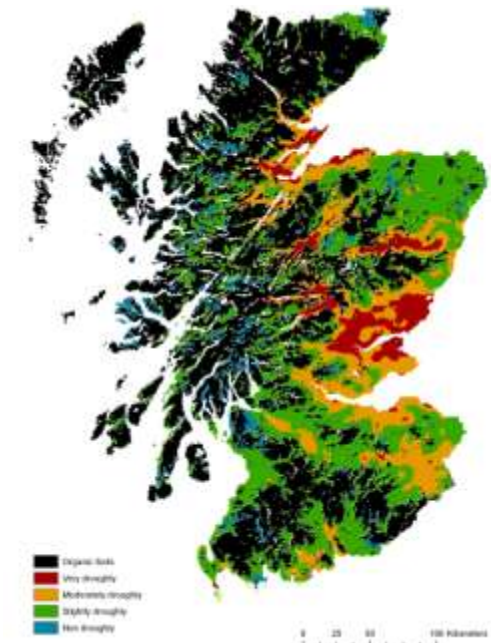
1 Drought risk - cereals



2050s-Q16



2050s-Q3

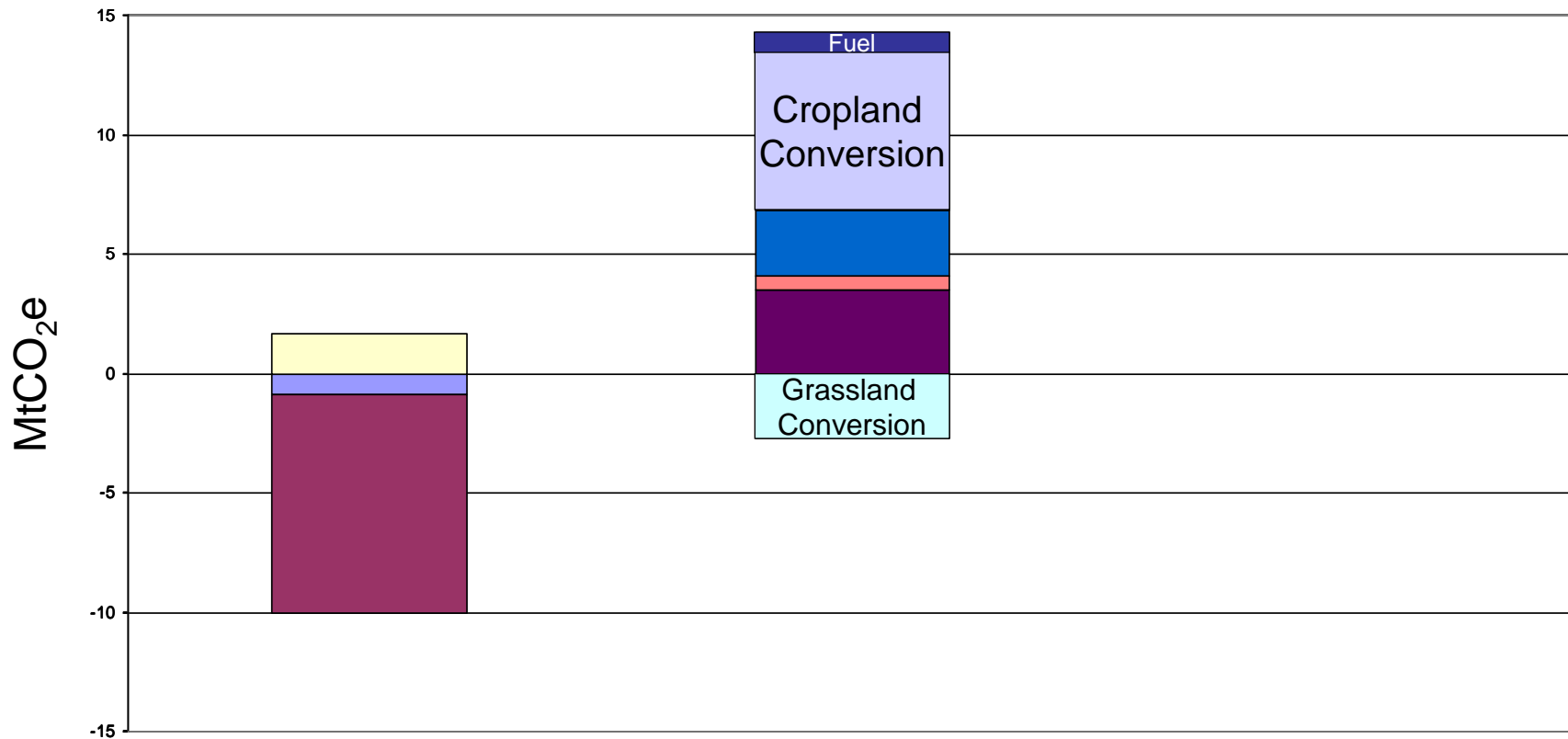


Challenges

- **UK Greenhouse Gas Inventory**
- **Use of evidence and dealing with uncertainty in policy and delivery**
- **How to reach those you want to influence; affecting behavioural change in a subsidised industry**



Defining emissions from agriculture



IPCC sector:

LULUCF

Agriculture

Energy

Agrochemical use

Fuel

Livestock: enteric fermentation

Livestock: waste management

Soil management

Grassland

Cropland

Settlements

Forestry

Harvested wood products

The Policy Cycle

