

Agricultural Decision Support Systems – experience from the past and their future under climate change

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Introduction

- Macaulay nearly 20 years of DSS, interactions with other key developers
- An positive advocate for computer based tools in support of practice and policy
- Reflect on strengths, limitations & challenges

Overview

- Phases of DSS development
- Recognition of an *implementation gap*
- Closing the gap – success factors, roles for DSS
- Approaching DSS as process not technology
- Question assumptions of Information Deficit
- Specific challenges for DSS and climate change?

DSS Origins

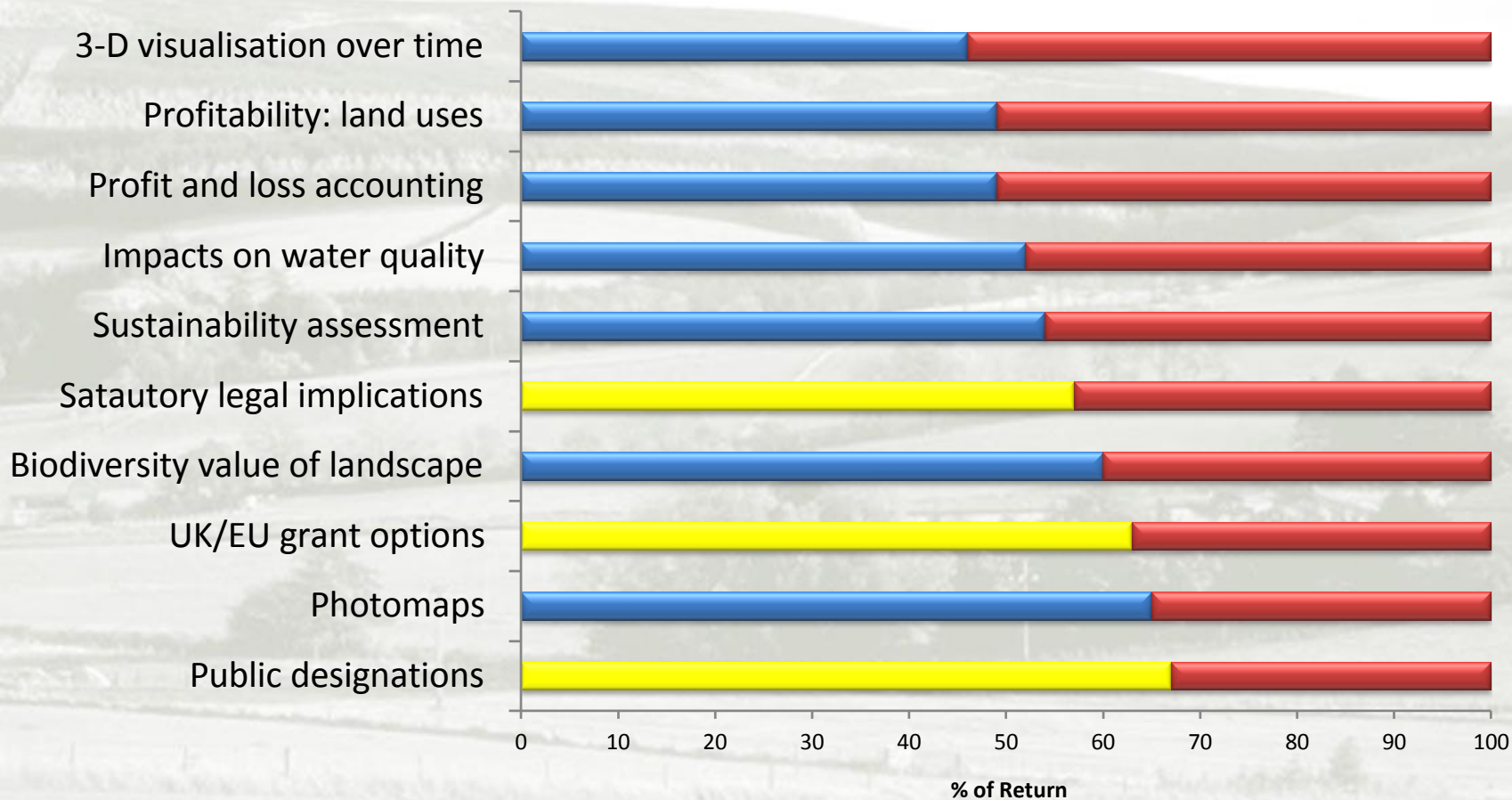
- Late 1970's – problems with sufficient structure, where judgement is crucial, adding to the manager's capability, support rather than automate.
- Mid-late 1990's – *ad hoc* or unexpected problems, valid representation of the real world, support in short time frame, evolve over time.

DSS @ Macaulay

- Market research
- Undertaken to assess commercial potential
- Nearly 10 years ago
- Desired capabilities
- Barriers to uptake and use

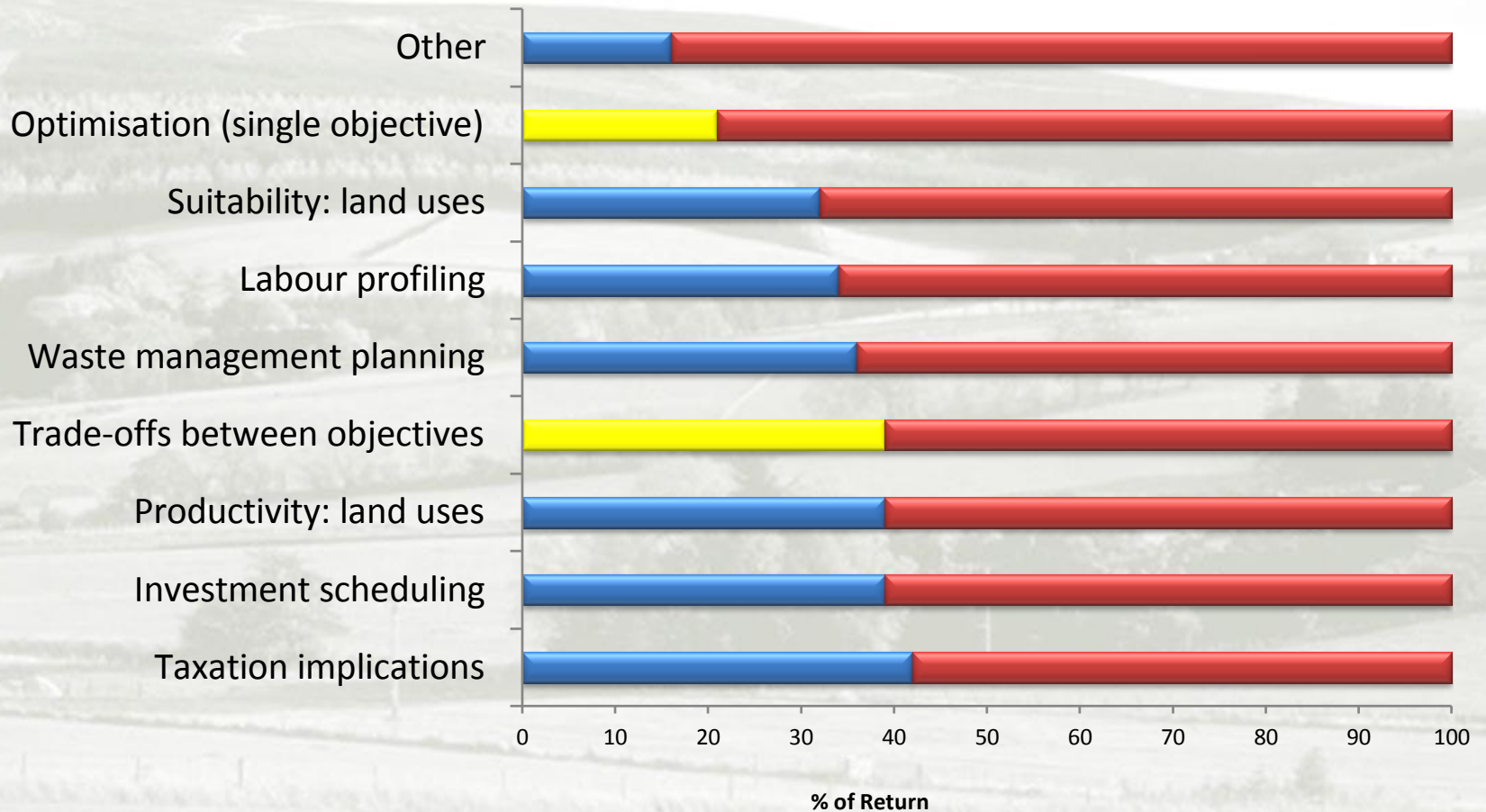
Q - Which of the following capabilities would you consider useful in a software system aimed at assisting decisions on future land use?

More desired Capabilities



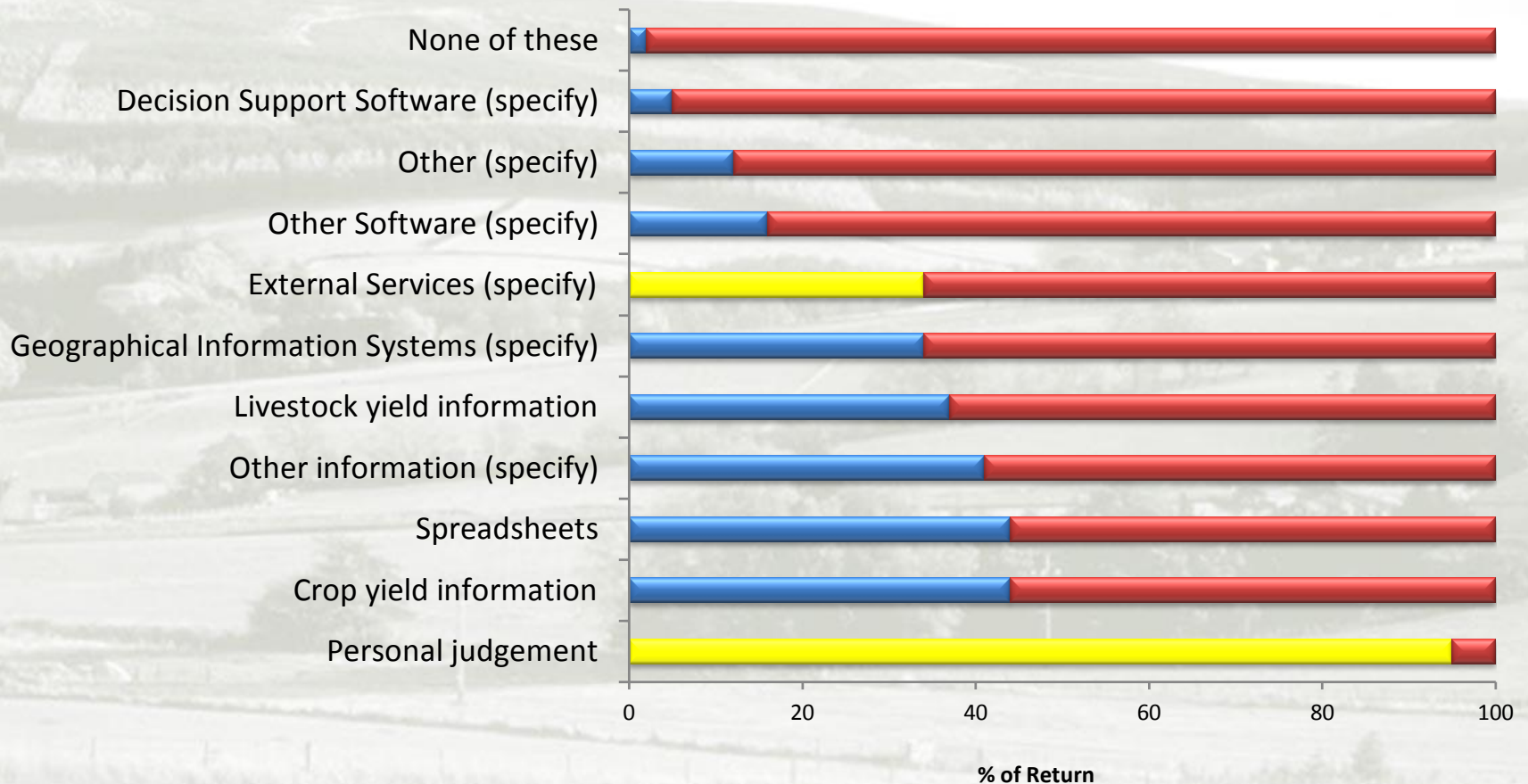
Q (cont) - Which of the following capabilities would you consider useful in a software system aimed at assisting decisions on future land use?

Less desired Capabilities



Q - What tools and resources does your organization mainly use to model the impact of alternative land use scenarios and take decisions on future use/allocation of land?

Tools and Resources



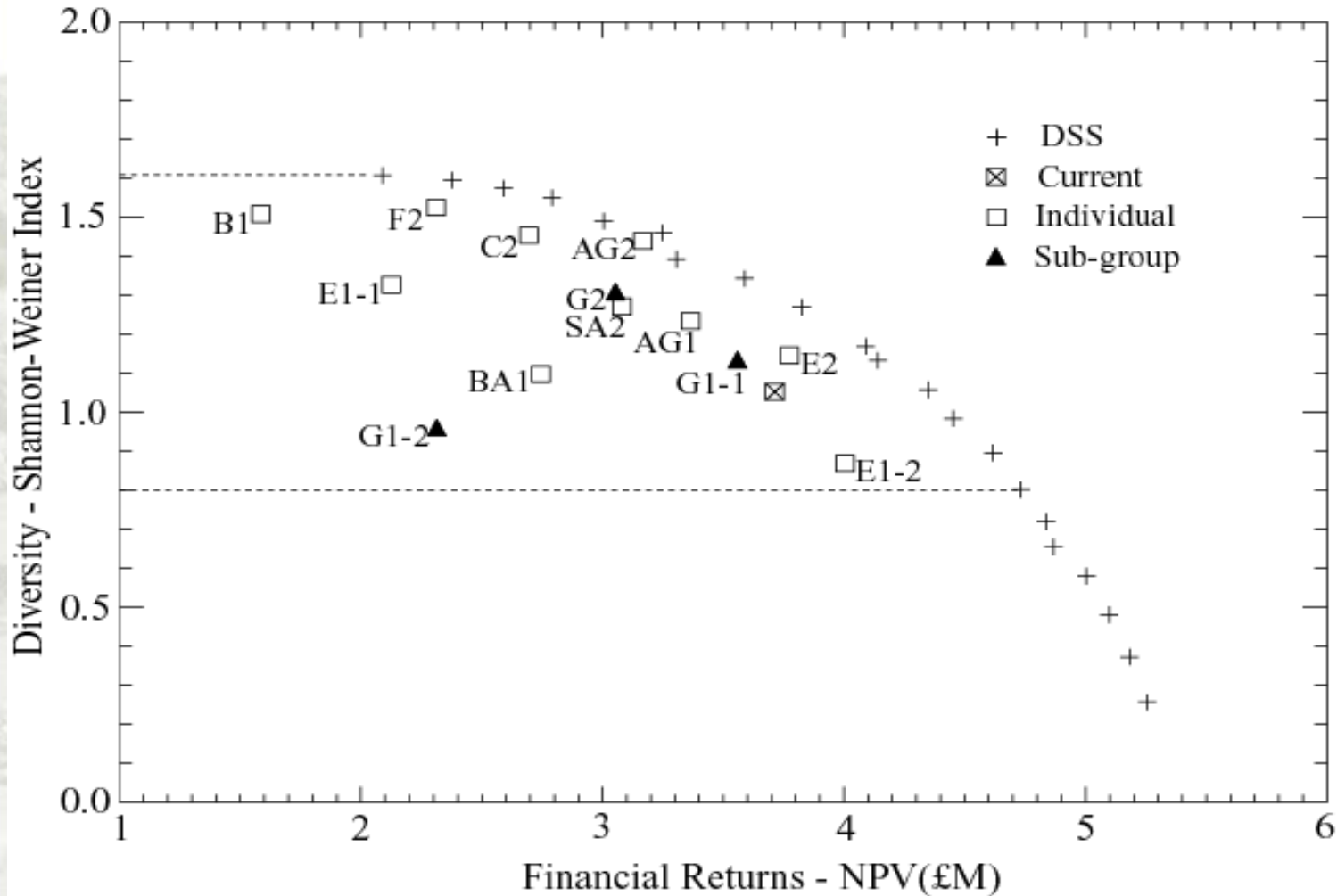
Explaining the Implementation Gap

- Too complex, not transparent, difficult to use
- Too data demanding, inflexible
- Answer the “wrong” questions - saliency
- Just not very good – e.g. don’t reproduce historical conditions – credibility
- Competition – niche filled by consultants
- Taking agency away from expert land manager

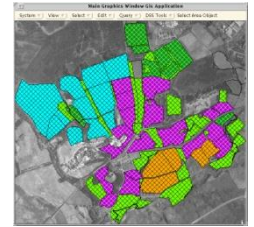
Positive Roles for DSS

- **Calculator** – end user, single issue, tactical, subsumed into experience
- **Record Keeper** – end user, statutory, supports best management auditing, ongoing
- **Flexible Simulator** – consultancy/WWW, counter-factual, strategic, policy and practice
- **Learning Environment** – consultancy/WWW, multiple-perspective, practice and policy

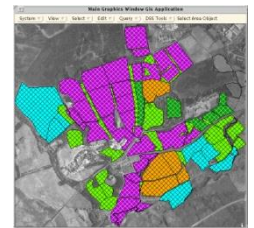
Example: DSS and Deliberation



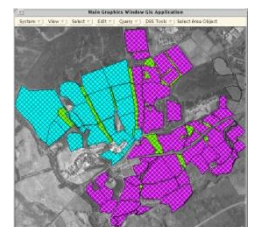
F-2(Diversity)



AG-2(Closest)



E1-2(Financial)



Challenges of DSS Partnerships

- *Stakeholder inclusion/participation as the solution to the implementation gap*
- Yes - DSS need to fit with the way an organisation or individual operates
- How to respond to feedback, how decisions are made (governance)
- Support, training, development etc (overhead)
- Finite project funding – orphaned DSS?

Information Deficit & Outcomes

- More/better information or tools = different decisions and improved outcomes?
- More information = less uncertainty?
- Is the DSS the best or even a good way to “package” information? – audiences

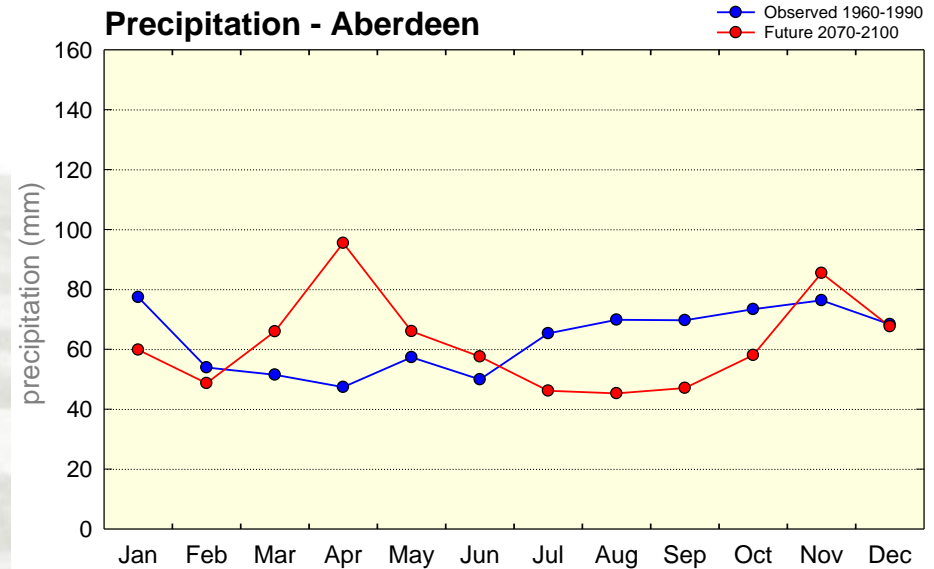
DSS and Climate Change

Climate data – quality & consequences

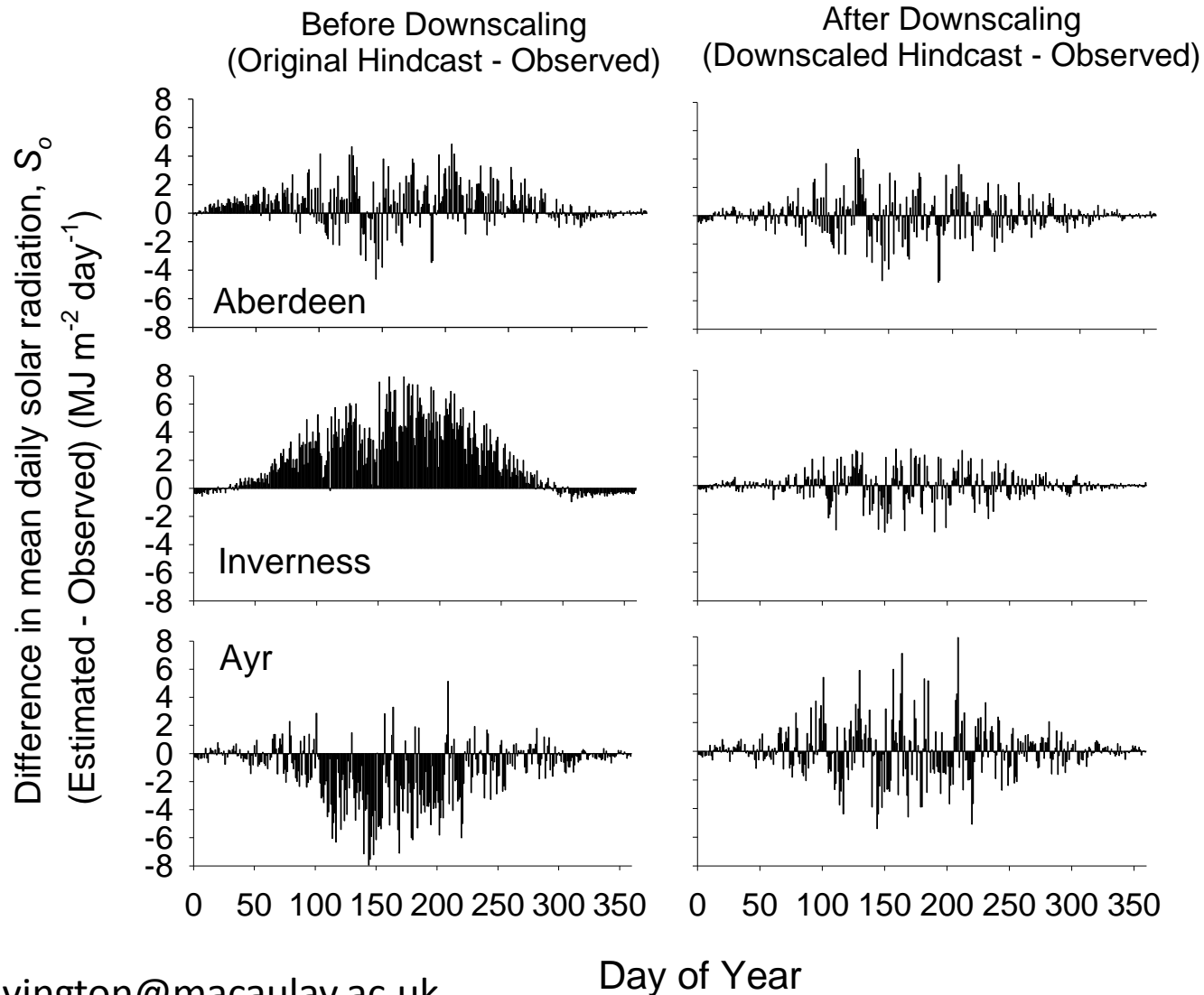
Down-scaling of RCM data

Agro-meteorological metrics and farm-systems models

Communicating Climate Change Consequences for Land Use (C⁴LU)



Data Quality - Downscaling



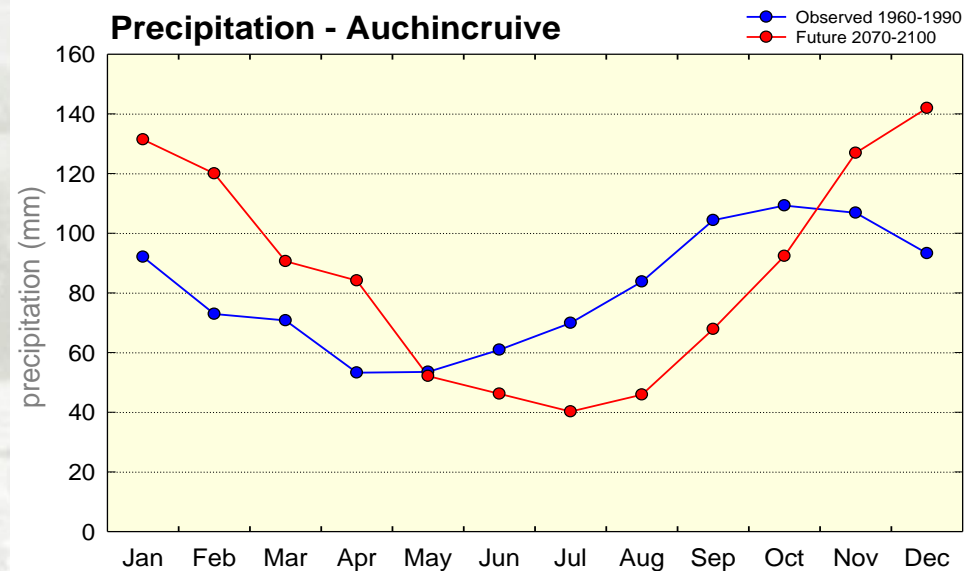
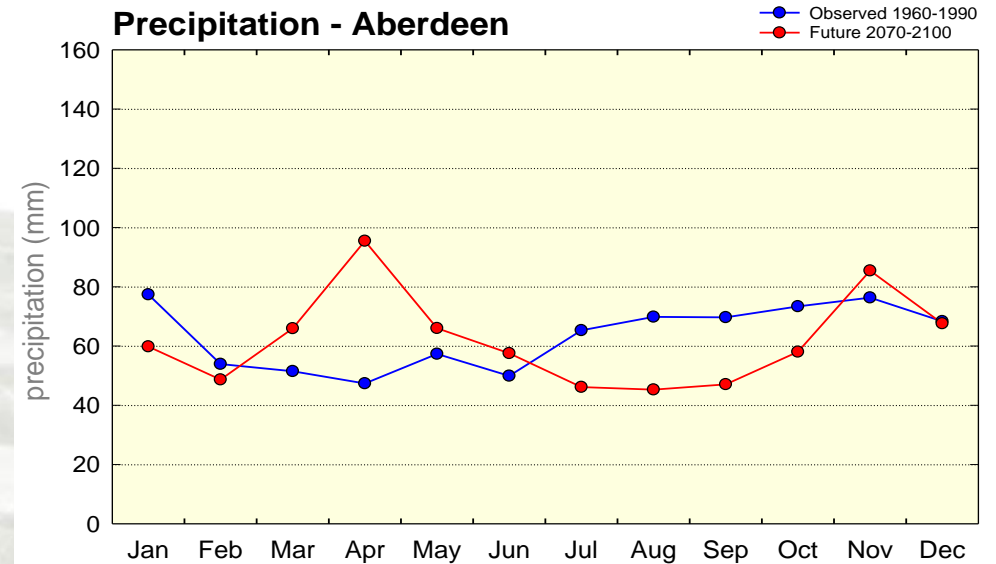
C⁴LU “Results”

Refuting the general with
the particular

Distribution rather than
amounts

Interest in single events but -

Little interest in what stays
the same – what is a
significant difference?

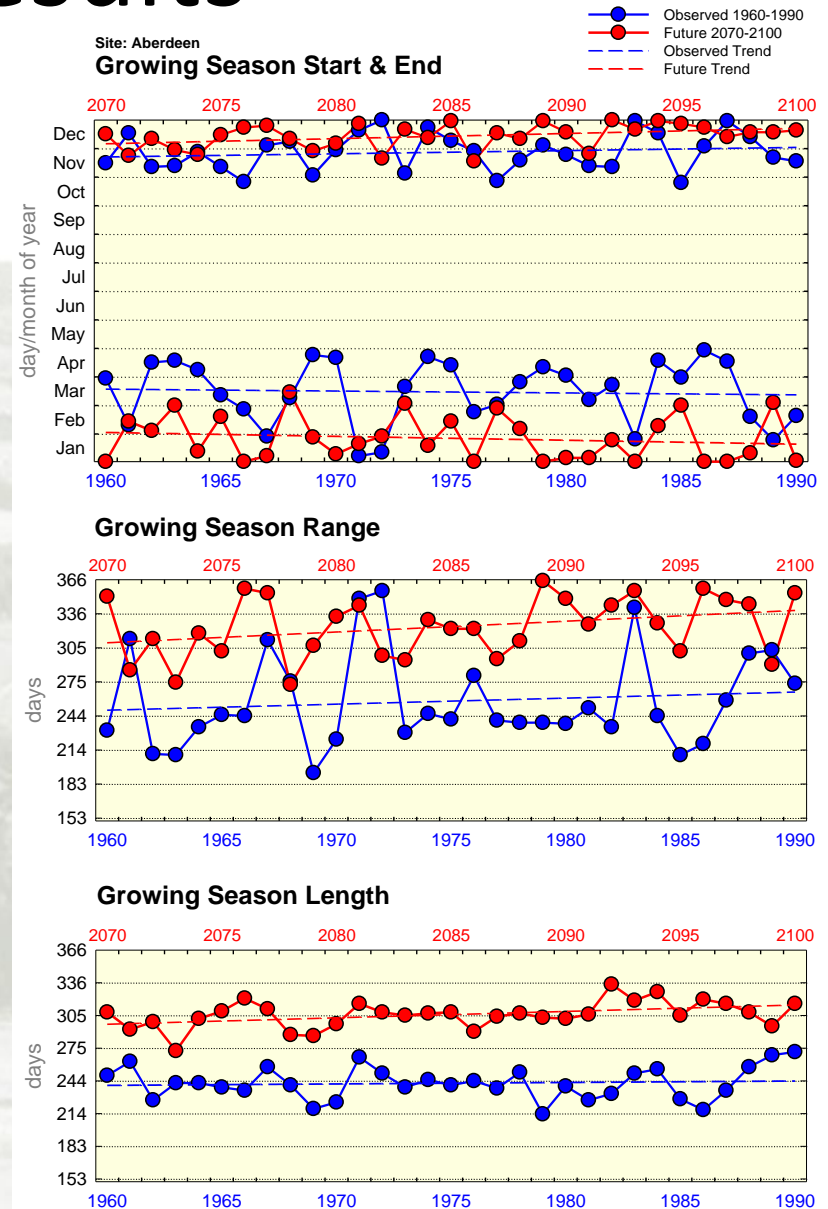


C⁴LU “Results”

Extended and often animated discussion of adaptation strategies (“what would we have to do”)

Comparisons with historical cases (“the drought of 1976”)

Anecdotal evidence of recent events with similarities to the future scenarios (“its already happening”)



Challenges for DSS and CC

- Computers needed for future simulations, but models are mistrusted - credibility
- Time scales – immediacy – climate proofing, investment - saliency
- Contested – CC exists, who's responsible etc - legitimacy

Questions?

Thank You

More information

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