

Roles for visualisation tools and geospatial data in the delivery public policy on land use and public participation

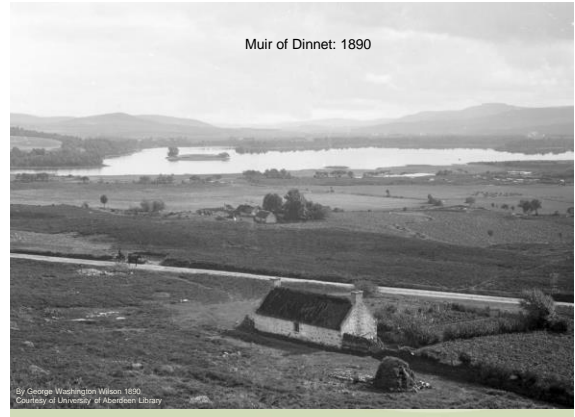


David Miller

Theme Leader, Realising Land's Potential

With Paula Horne, Chen Wang, Gillian Donaldson-Selby, Jane Morrice

University of Zürich, 17th December 2013



Muir of Dinnet: 1890

By George Washington Wilson, 1890. Courtesy of University of Aberdeen Library



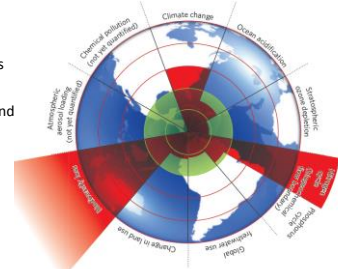
Little Inverey: c1900

By George Washington Wilson, c1900. Courtesy of University of Aberdeen Library

The 'Securities': Environment

Plus, food, energy, water security

- Scarcity and degradation of environmental assets
- Depletion of natural resources (e.g. soil and biodiversity)
- Climate change
- Pollution



Source: Rockstrom et al. (2009) A safe operating space for humanity. *Nature* 461 (24) 473-475.

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Pressures for Change



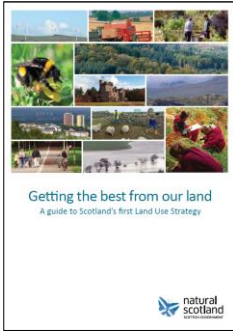
Policy Contexts and Practice

- Breadth of policy and practice contexts increasing rapidly
- Increasing number of teams, people and organisations



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Scottish Land Use Strategy

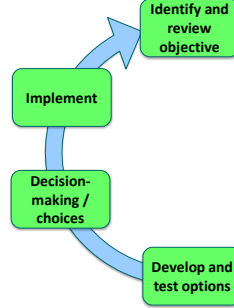


Principle 1:
 'People should have **opportunities** to contribute to debates and decisions about land use and management which affect their lives and their future'

Proposal 12:
 Identify and publicise **effective ways** for communities to contribute to land-use debates and decision-making'

Ecosystem Approach

Approaches advocated for adaptive management



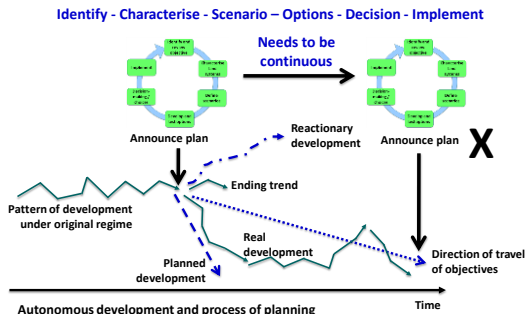
"Integrated management of land, water and living resources in an equitable way."

Source: UN Convention on Biological Diversity, 2000.

- People centred approach
- Participation at key stages to develop resilience

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Planning and Change



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Public Engagement, Consultation, Awareness Raising



Purposes

- Research
- Consultation
- Awareness raising
- Communicating results
- Feedback

Introduce Tools: Voting

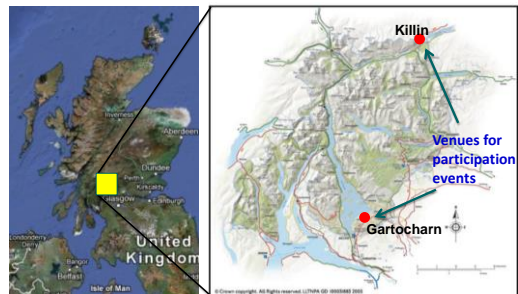


Lesson: Make event enjoyable, and provide local links

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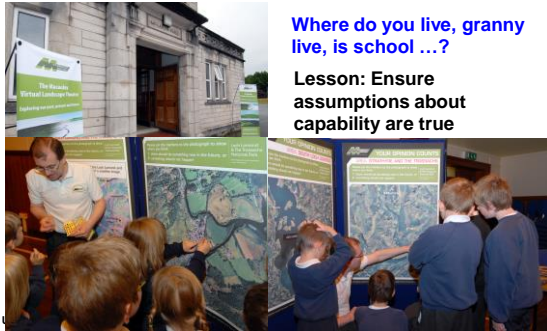
Younger People: Visioning

Loch Lomond and The Trossachs National Park



Making the Connection

Loch Lomond & Trossachs National Park: Planning



Where do you live, granny live, is school ...?

Lesson: Ensure assumptions about capability are true

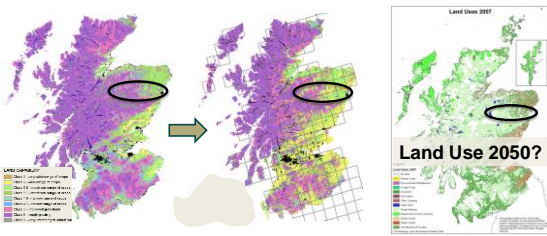
Younger People: Visioning

- Energy: small not large scale wind, more hydro
- Woodland: replace lost trees, no more plantations
- Concern Dentist 1 hour, no ambulance, affordable housing
- Facilities: Clothes and food shops (NOT MacDonalds/Burger King)



In collaboration with Loch Lomond and The Trossachs National Park Authority

Developing Scenarios of Future Land Use Link socio-economic scenarios with biophysical change



- New opportunities: e.g. expansion of energy crops
- Increased potential competes with enhanced agricultural capability
- Needs adaptation of land management systems

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Future Land Use Patterns

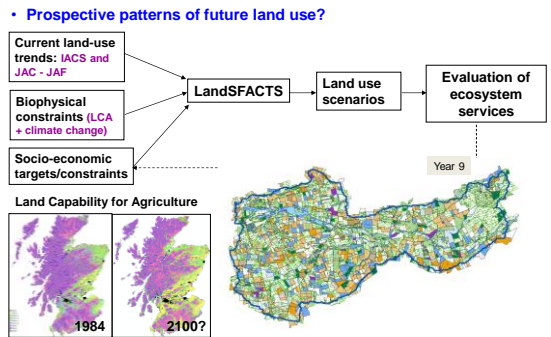


Image courtesy: Marie Castellazzi

Land Use Scenarios

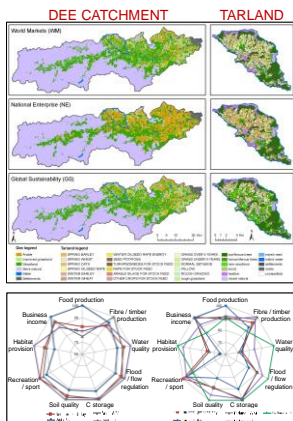


Modified from IPCC, and UK Risk Assessment

Land Use Change (multiple scales)



Implications for Ecosystem Services



Public Discussion

- Select priority topics (e.g. renewable energy, woodlands, housing, transport, conservation)
- 'Drag and drop' feature into place
- Discussion of issues, voting on audience agreement



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Community Visions for Future Land Uses



At what scale is it best to make the plan and the decision?

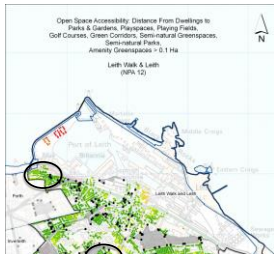
Urban Landscapes: Green space, Health and Well-being

• Understanding the contribution of greenspace to human health and well-being



Pressures on greenspace due to urban land use change
Significance? To whom? Where?

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Cortisol slope linked to: physical activity and % of green space

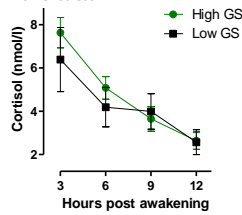
Self-reported stress linked to: % green space

In economically deprived areas, living in vicinity of more greenspace linked to lower levels of self-reported stress

Greenspace and Well-being

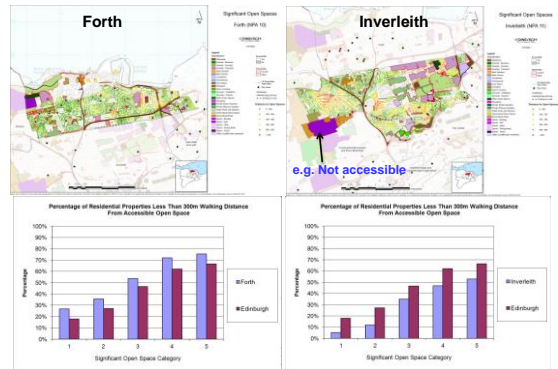
Are perceptions and measures of greenspace linked to physical and mental health, and well-being?

High % greenspace is conducive to lower stress

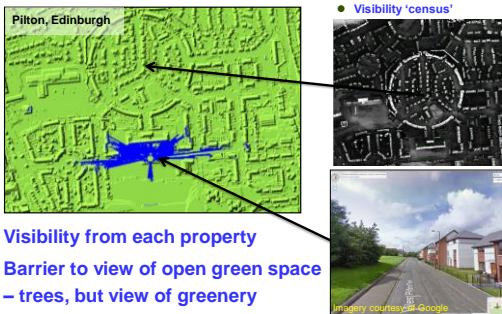


Laing et al. (2009) Environment and Planning B
Ward Thompson et al. (2012) Landscape and Urban Planning

Access and Availability



'Visible Access'



- Visibility from each property
- Barrier to view of open green space – trees, but view of greenery
- Visual definition of area

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Physical and Visual Accessibility

• Combine walking distance and visibility of green space



- Distance: 300 m
- Distance: 200 m
- Visibility: median view
- Visibility: median view

Current research:

- Changes in self-reported stress relating to land use and demographic change
- Dependencies – demographics and household change, land use (plan and vertical)

Miller et al. (2012) Design and Decision Support Systems

Green space services: Community views

Aim Enable community selection of features for future uses of spaces

- Peace and quiet, read, escape
- Play, sport, socialise
- Habitat management – green and blue



Virtual Landscape Theatre, Finmill Centre, Dundee



Green space services: Community views



Virtual Landscape Theatre, Finmill Centre, Dundee

- Agreement: dog restricted areas, more trees, park benches, shelter
- Disagreement: benches on south facing slope – for sunshine, or in trees – for shade
- Surprise: car parking, for weekend football matches!
- Area reputation: different associations by age group and time in area

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Wang et al. (2013) IEEE Computer Science and Automation Engineering



Multi-functional Green Spaces

More woodland – noise buffers Link woodland units – green network



Burn – a boundary Water - relaxing Play – fish nets?
Community management of burn

Current research:

- Relationship between scale, function and services (Scottish Government Programme) (Finlathen Park, Dundee)

Awareness Raising: Aberdeen Offshore Windfarm



- Public**
- Increase understanding:
 - Renewable energy
 - Offshore wind farms
 - Potential impacts

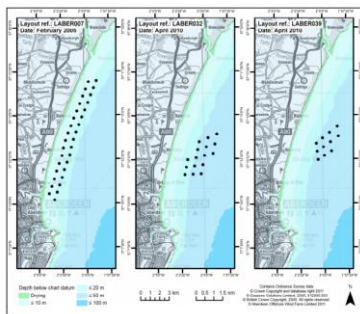
- Discussion forum:
 - Potential impacts

Scottish Parliament

Children, Hands on

Lesson: Understand audience authority – decision-maker, advisor, ...

Changes in Layout Over Time



Drivers of change?

Describe, Explain, Ask



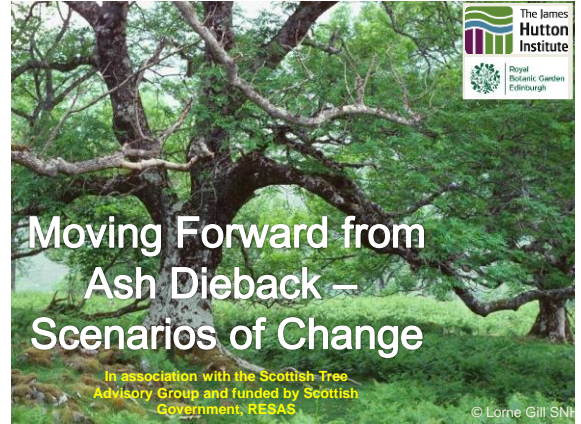
Polling opinions

Changes: Issues Raised Over Time



Is this change significant?

Will opinion changes in support or as a reaction to Mr Trump?



Background

Communications
Strategy of National
Chalara Action Plan

Aims
Raise public awareness
Promote good practice



In collaboration with Forestry Commission Scotland, Royal Botanic Gardens Edinburgh
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Chalara dieback of ash



Mid-1990s

Courtesy of:
Rimvys Vasaitus,
Assoc. Professor,
Swedish University of
Agricultural Sciences

Chalara dieback of ash



2012

Courtesy of:
Rimvys Vasaitus,
Assoc. Professor,
Swedish University of
Agricultural Sciences

Public Engagement

Format
Introduce issue
Present facts
Encourage discussion



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Illustrate Change

Present scenarios of disease spread and impact



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Highlight Good Practice

How you can help:

TO PREVENT PLANT DISEASES SPREADING, YOU SHOULD TRY TO AVOID TRACKING UP PLANT GERMS, AND MAKE SURE YOU DON'T MOVE THEM TO NEW AREAS. FOR EXAMPLE:



Park on hard standing if possible.

Clean mud and leaves off your boots, bike etc. before you leave.

If you have to drive on muddy areas, clean as much as possible off your wheels and wheel arches before you leave.



Clean footwear and equipment well **away** from streams, which could carry germs to other areas.

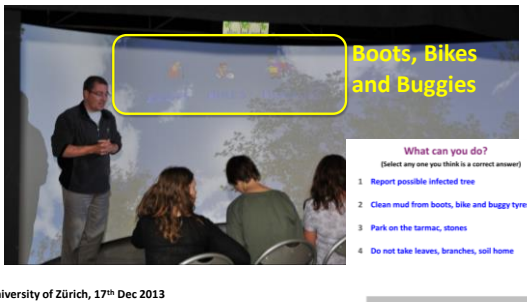
Don't take any plant material away with you – you could bring infection back to your garden.

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Source: Scottish Government, 2013

Check on Communication Success

- Test for lessons remembered by audience
- Ensure that everyone leaves with a right answer!



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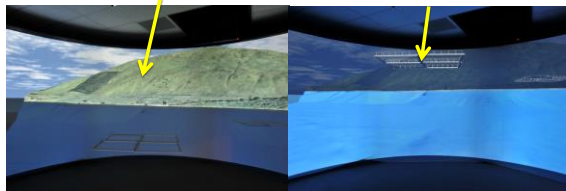
Tune Event to Audience



Above and Below Water

- What impact does land use have on sea/coastal use?

Increase forestry here Impact on fish farm here?



Above waterline view

Below waterline view

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Engaging Young Researchers

21st June 2012

"There was a very excited little girl here this morning when your parcel arrived! I thought you should share the moment with the pictures.

Many, many thanks for this, and for all your efforts in arranging the event itself. I'm sure there are times when you think about the value given the effort and time involved. I've discovered that with children, you never can tell the point of revelation for them, or what was important in the build up to a decision in later life to pursue a particular course, in this case in science etc. But those moments are there. The pupils here had a great time and an even better experience of something that without your input, would never have happened. Thank you."

Best wishes
Graham
Graham Dickie
Headteacher
Kilchrean Primary School
by Taynuilt

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Examples of Feedback



Examples of Feedback

Loch Lomond & Trossachs National Park events

Pupils:

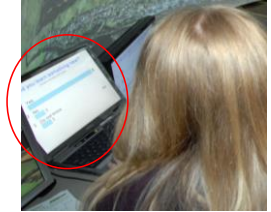
Enjoyed event	94%
Learnt something new	78%
Learnt something of use in class	68%

Percentage participation (individual voting)

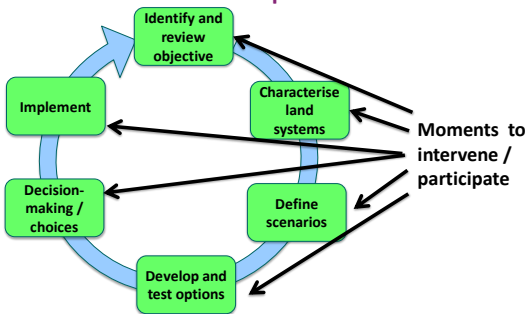
Response consistency	81%
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Teachers:
Relevance Very High

Direct link to Curriculum for Excellence



Ecosystem Approach – Moments to Participate



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Current Research

Landscapes

- Identify 'tipping points' in landscape character
- What are the path dependencies in landscapes?
- Methods – eye-tracking linked to 3D modelling

• Landscape and well-being

- What role have cultural services in human well-being?

• Multiple benefits and trade-offs

- Direct and indirect effects of drivers of change: Common Agricultural Policy, renewable energy, climate change, urbanisation

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