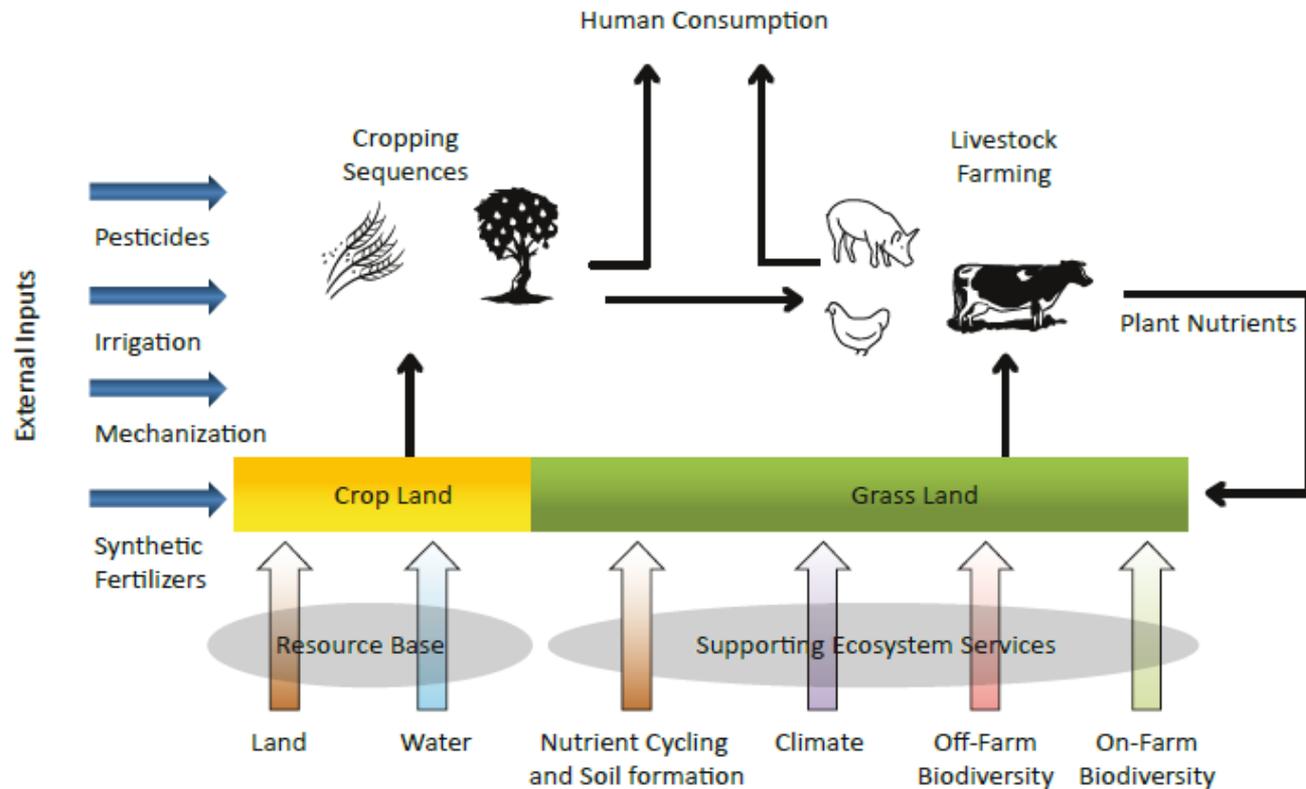


Biodiversity, Ecosystem Services and Indicators

MATT WALPOLE

Biodiversity provides a range of ecosystem services for food and agriculture...



... including maintaining soils

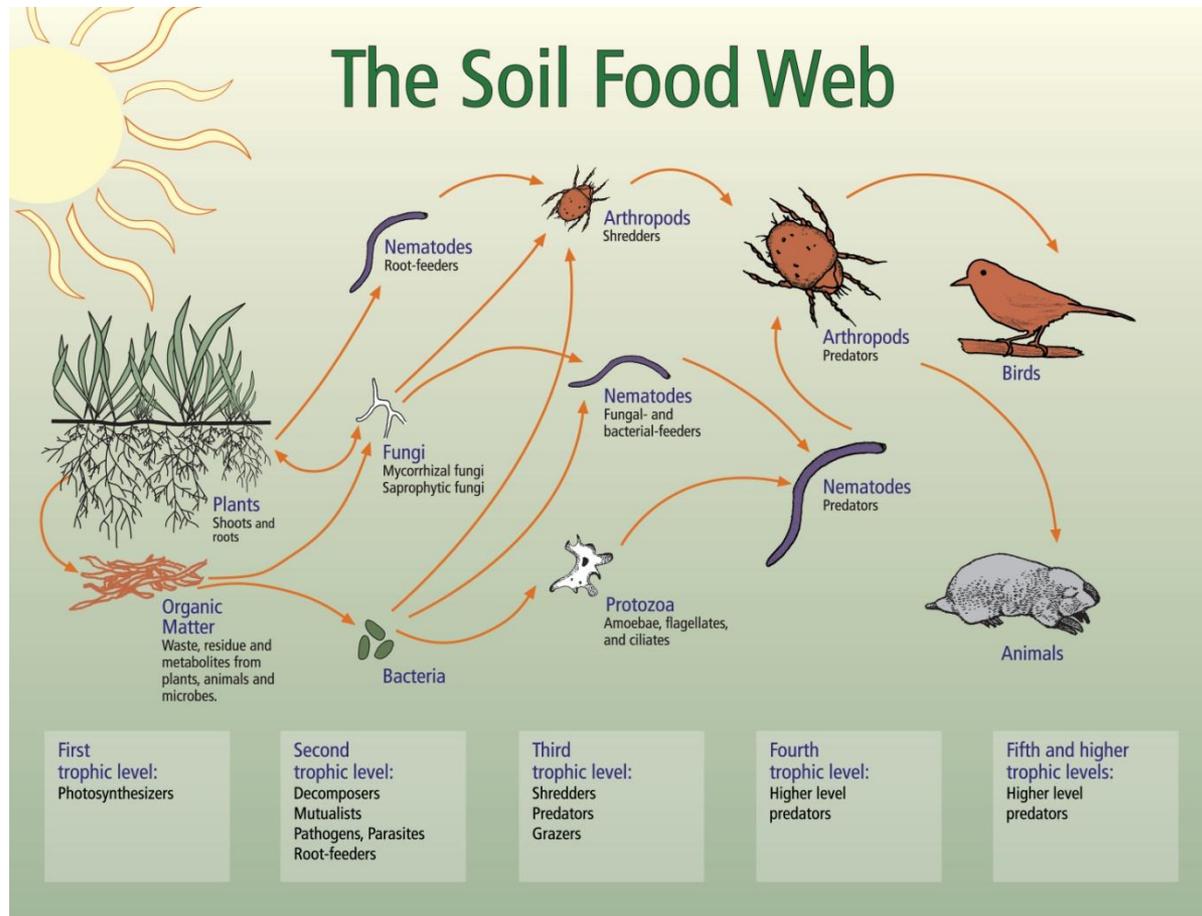
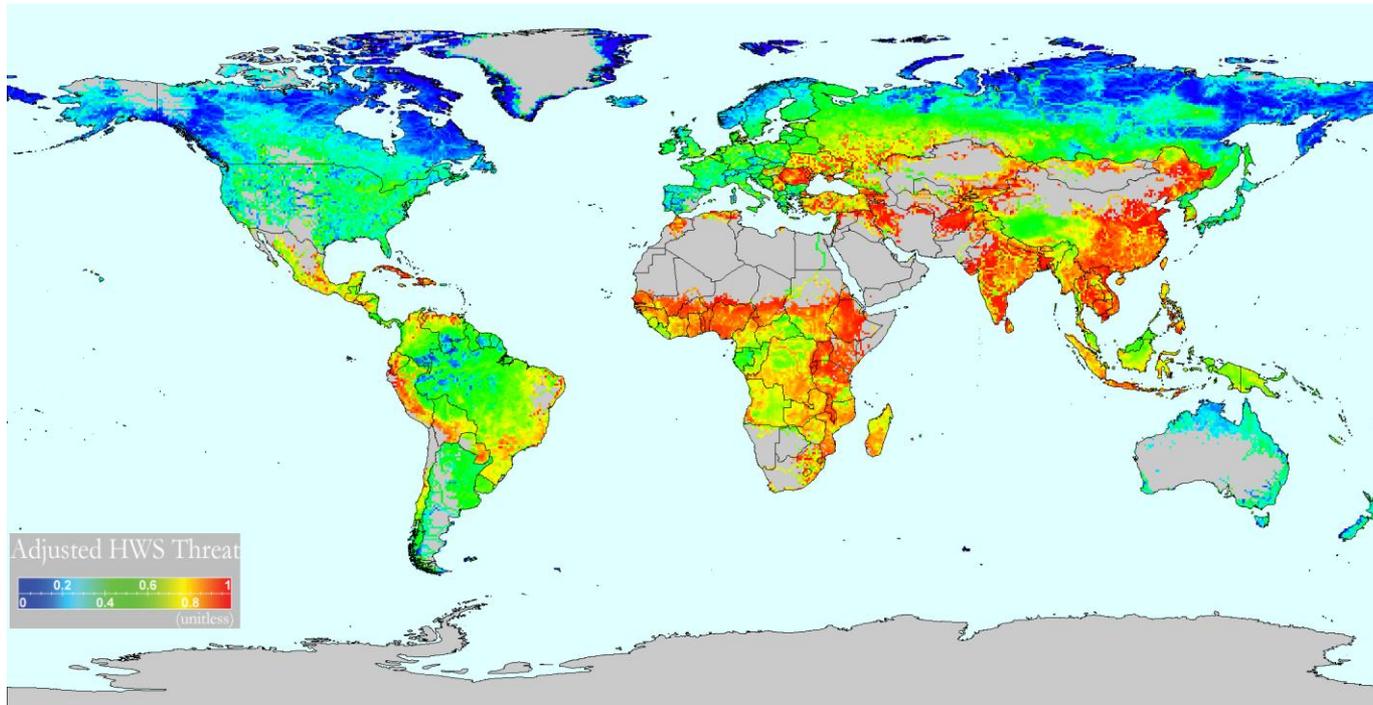


Image courtesy of USDA Natural Resources Conservation Service, http://soils.usda.gov/sqi/concepts/soil_biology/biology.html

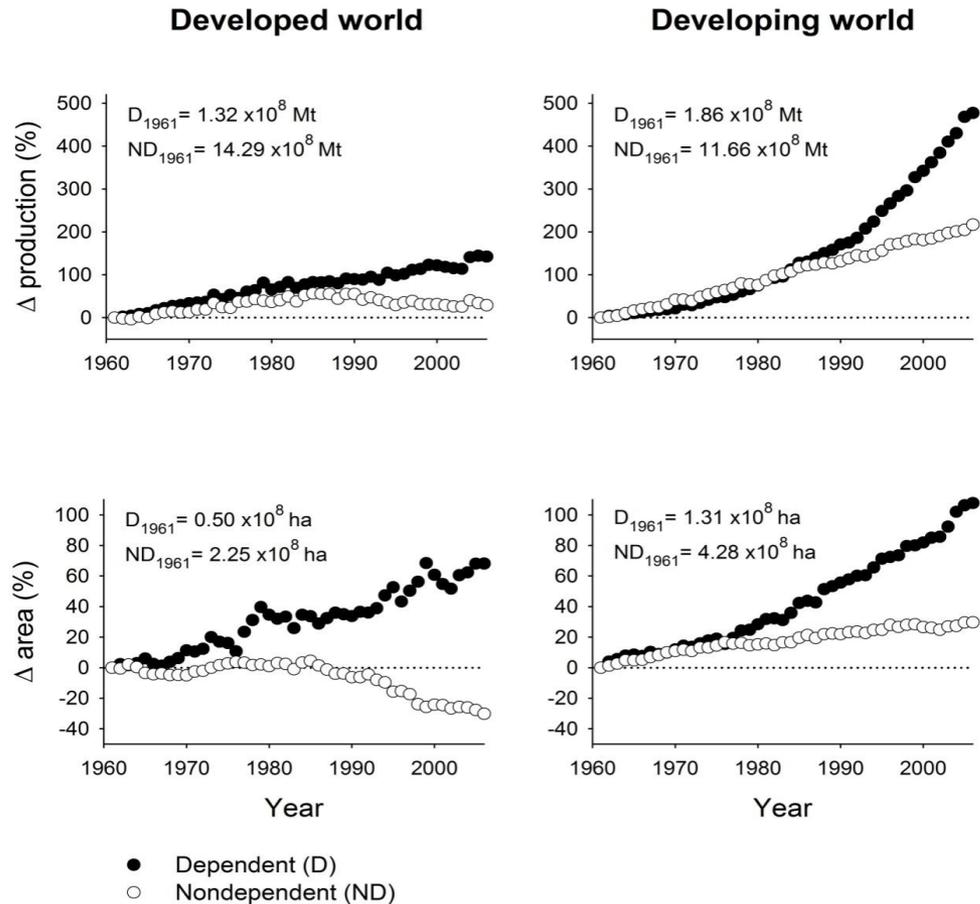
... freshwater provision



Human water security (HWS) threat to river systems

Source: Vörösmarty et al. 2010

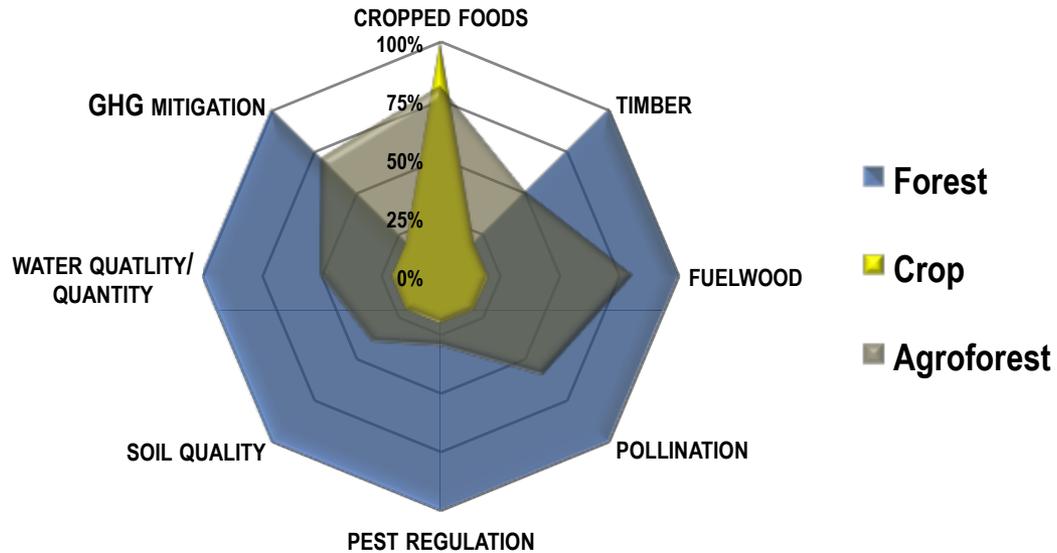
... and pollination services



Increasing proportions of crop area/production are pollinator dependent

Source: Aizen et al. 2008

Ecosystem management on and off farm therefore affects services and sustainability



The Aichi Biodiversity Targets reflect this



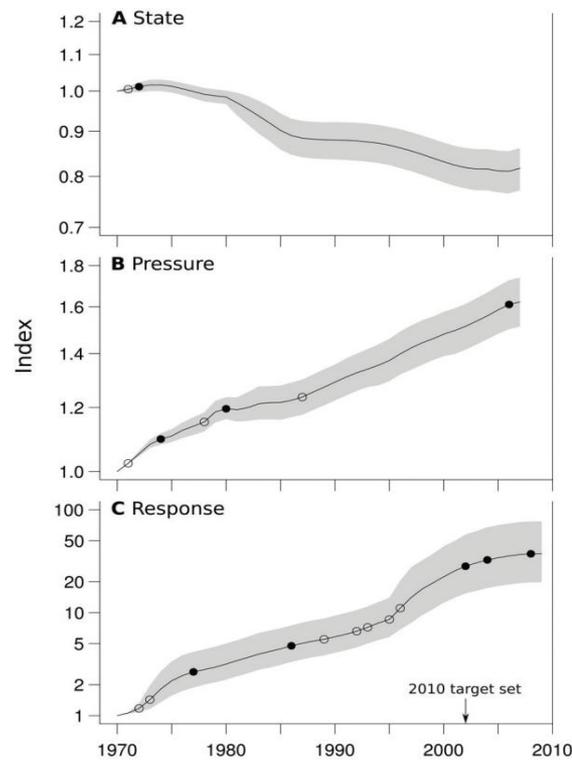
Biodiversity Indicators Partnership

‘WORKING TOGETHER TO TRACK GLOBAL BIODIVERSITY TRENDS’



www.bipindicators.net

Bringing together indicators of state, pressure and response



Global Biodiversity: Indicators of Recent Declines

Stuart N. M. Butchart,^{1,2*} Matt Walpole,³ Ben Collen,³ Arco van Strien,⁴ Jörn P. W. Scharfmann,⁵ Rosamunde E. A. Almond,⁵ Jonathan E. M. Baillie,⁶ Bastian Bomhard,¹ Claire Brown,¹ John Bruno,⁷ Kent E. Carpenter,⁸ Geneviève M. Carr,⁷† Janice Chanson,⁸ Anna M. Cheney,³ Jorge Csirke,⁹ Nick C. Davidson,¹⁰ Frank Dentener,¹¹ Matt Foster,¹² Alessandro Galli,¹³ James N. Galloway,¹⁴ Piero Genovesi,¹⁵ Richard D. Gregory,¹⁶ Marc Hockings,¹⁷ Valerie Kapos,^{1,18} Jean-Francois Lamarque,¹⁹ Fiona Leverington,¹⁷ Jonathan Loh,²⁰ Melodie A. McGeoch,²¹ Louise McRae,² Anahit Minasyan,²² Monica Hernández Morcillo,³ Thomasina E. E. Oldfield,²³ Daniel Pauly,²⁴ Suhel Quader,²⁵ Carmen Revenga,²⁶ John R. Sauer,²⁷ Benjamin Skolnik,²⁸ Dian Spear,²⁹ Damon Stanwell-Smith,³ Simon N. Stuart,^{1,12,30,31} Andy Symes,² Megan Tierney,¹ Tristan D. Tyrrell,³ Jean-Christophe Vie,³² Reg Watson³³

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Including genetic diversity ...

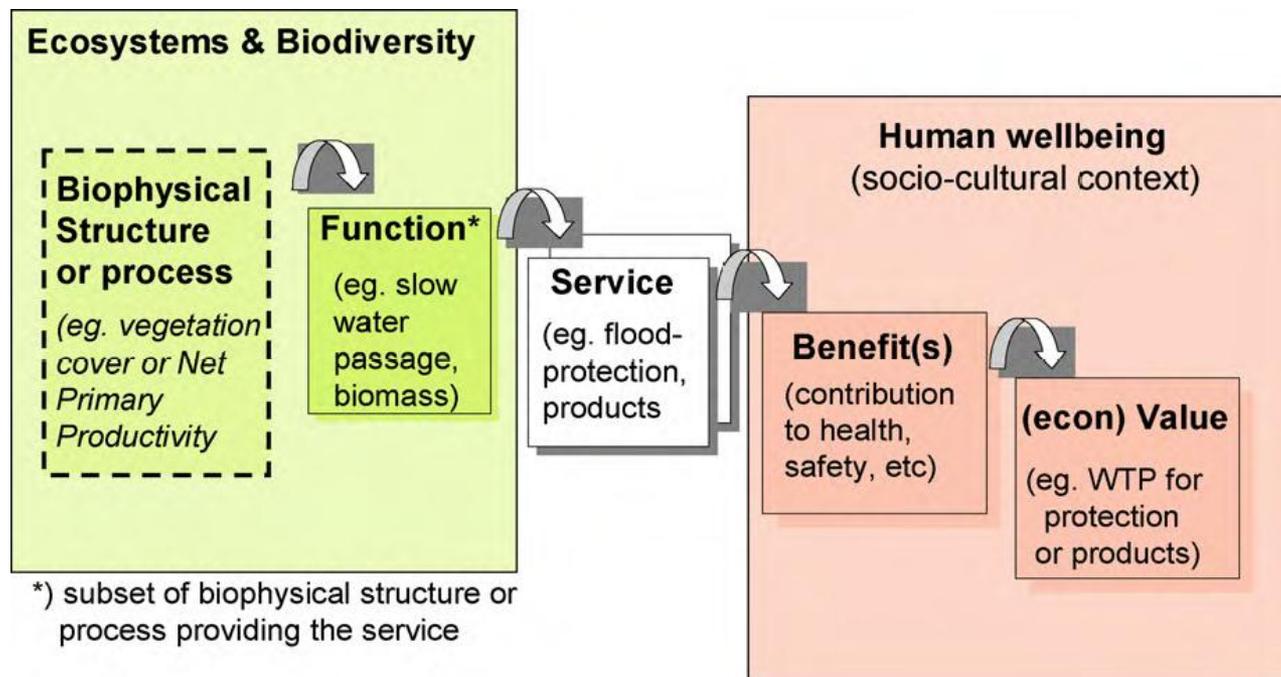
Aichi Biodiversity Target 13

*By 2020, the **genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives**, including other socio-economically as well as culturally valuable species, is **maintained**, and **strategies have been developed** and implemented for **minimizing genetic erosion** and **safeguarding their genetic diversity***



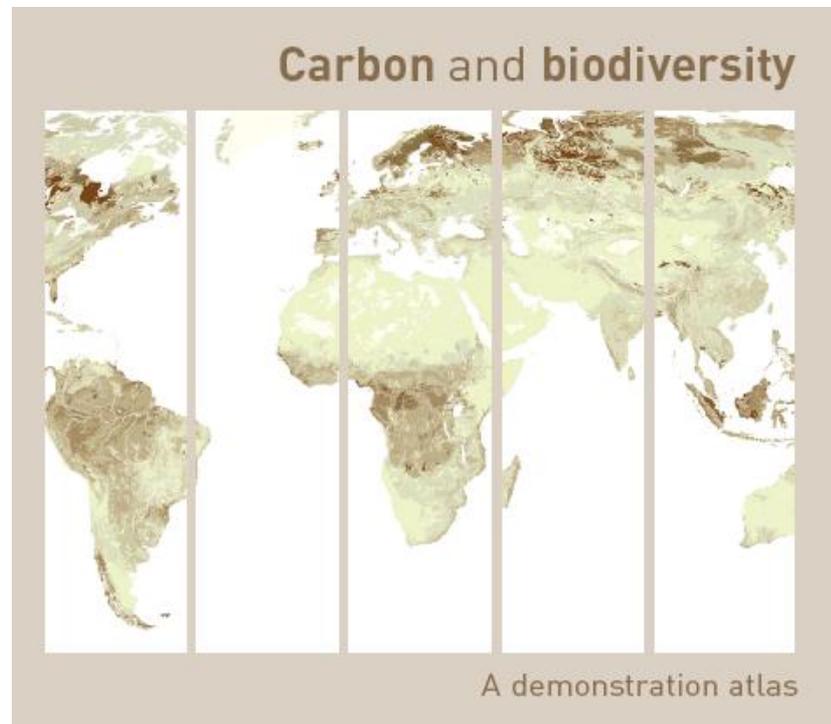
What about ecosystem service indicators?

Is it enough to focus on the state of the ecosystem?



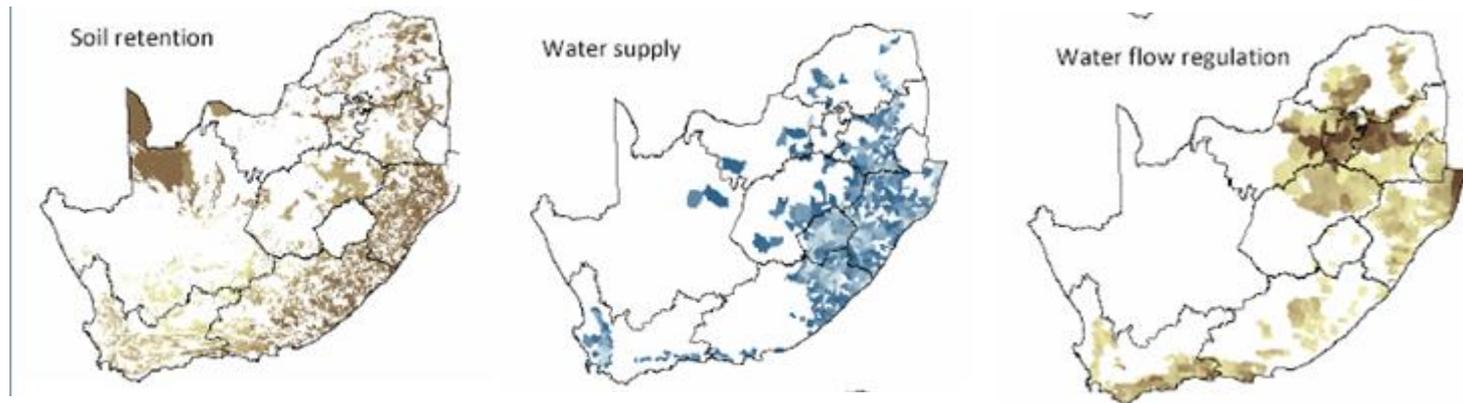
Mapping and modeling ecosystem services

Useful tools for some services, if properly validated



Mapping and modeling ecosystem services

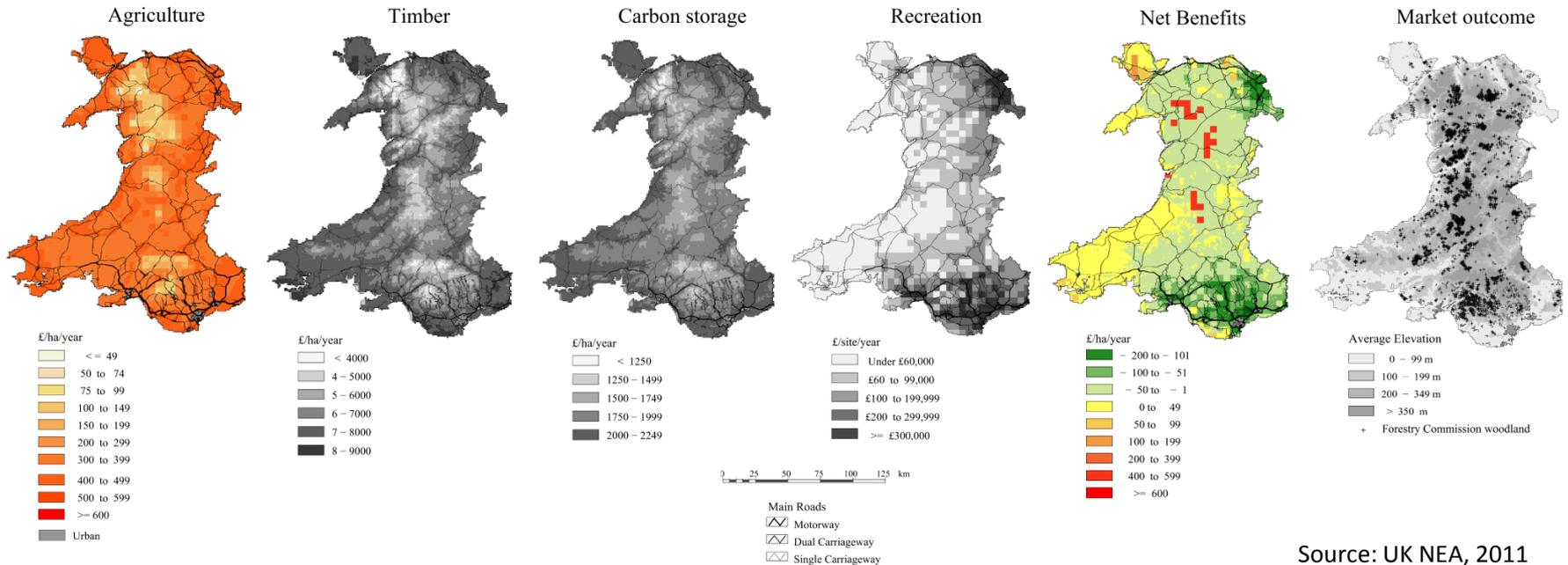
Useful tools for some services, if properly validated



Source: CSIR

Valuing ecosystem services

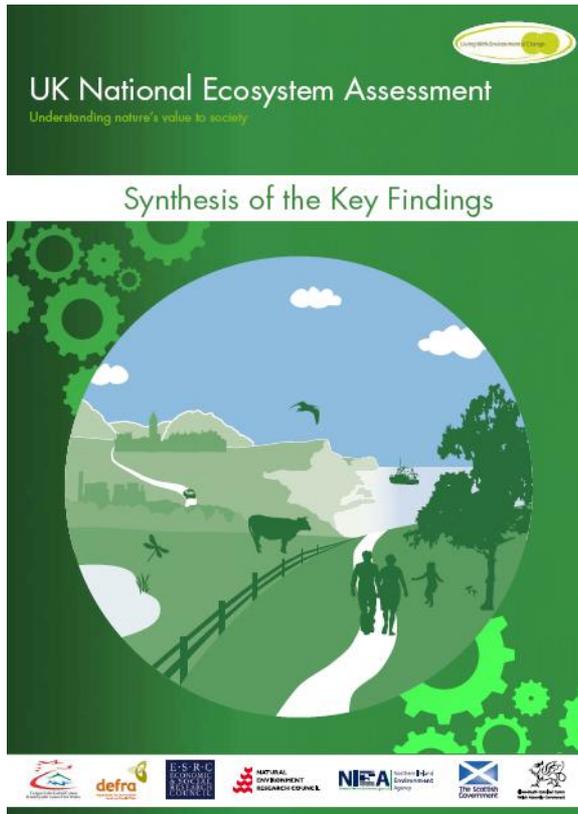
Techniques are improving....



Source: UK NEA, 2011

Ecosystem Service Assessments

Often rely on expert opinion ...



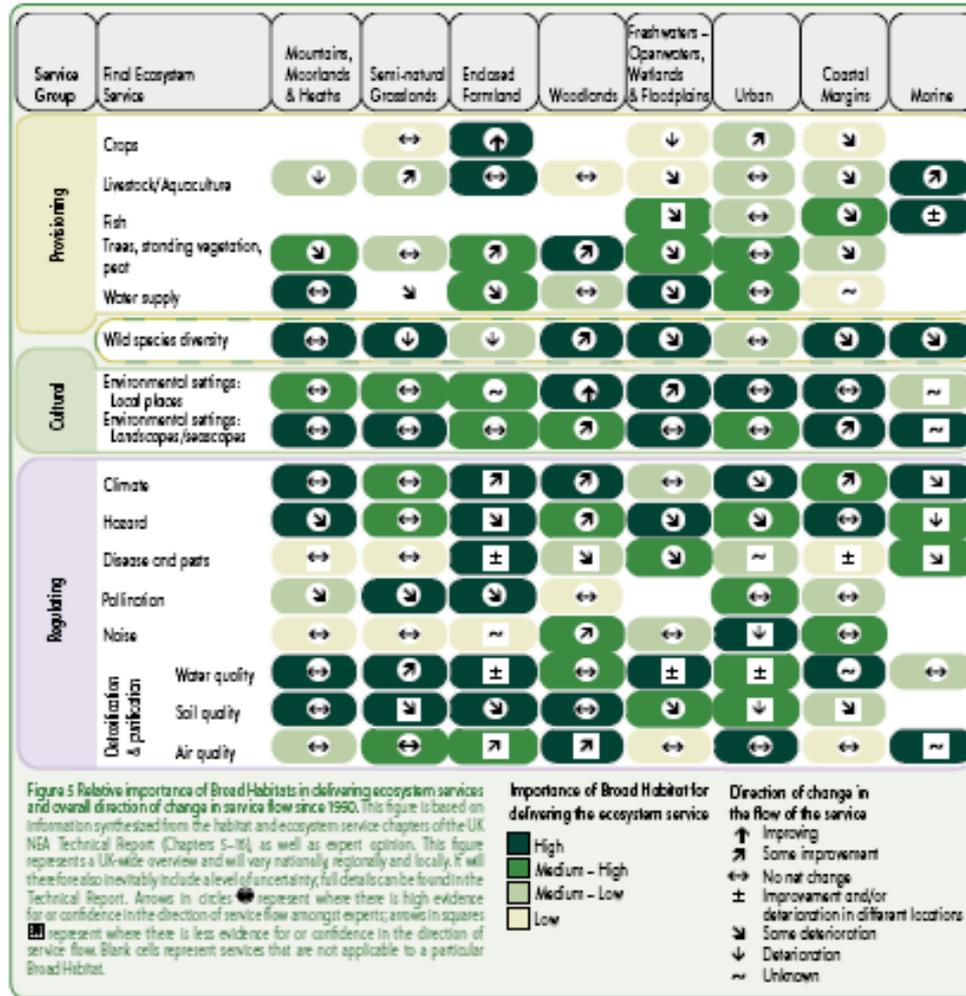
"I know nothing about the subject,
but I'm happy to give you my expert opinion."

Ecosystem S

Often rely on exp

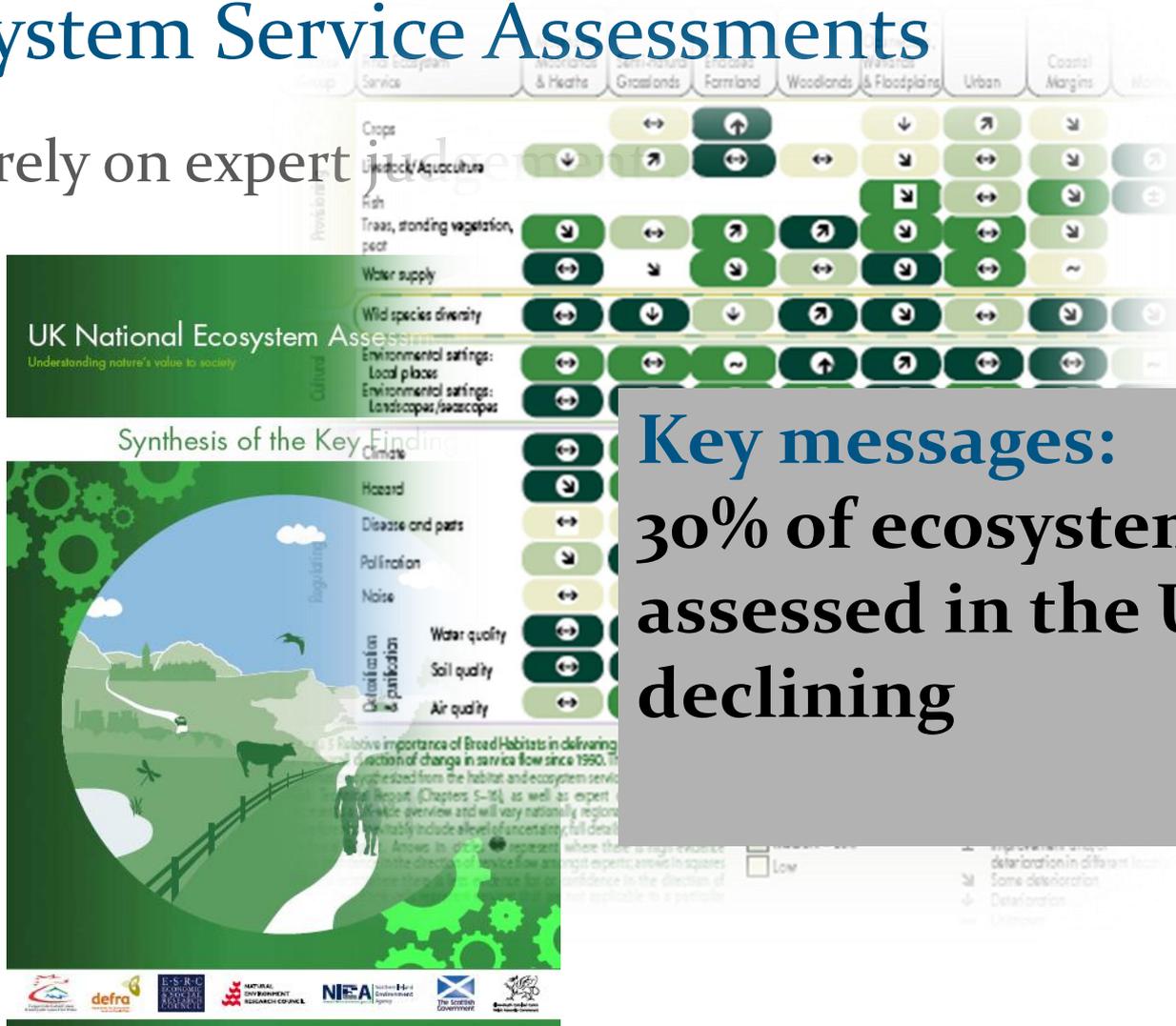


Synthesis of



Ecosystem Service Assessments

Often rely on expert judgement



Ecosystem service beneficiaries

It isn't just about supply – beneficiary distributions also vary:

“There is much more to be explored and understood in terms of the ways that different people in different places benefit from ecosystem services.”

UK NEA, 2011.

Summing up – key message/s

- Assessing change and developing good indicators is critical for management
- Building on what exists and drawing from different processes and sectors is valuable
- A suite of linked indicators helps to tell a coherent story
- Looking beyond the biodiversity of crops, livestock and fisheries to understand implications of biodiversity change in wider ecosystems (for ecosystem functioning and services) is important