Blue Communities

Interdisciplinary research – aligning the economy with ecology and ecosystems to create decision support tools

Mel Austen
Plymouth Marine Laboratory
mcva@pml.ac.uk

PML | Plymouth Marine Laboratory

Funded by UK Government

Funded by:

GCRF Global Challenges Research Fund
UK Research and Innovation

PEMSEA EAS Congress 2018
November 2018; Iloilo, Philippines

www.blue-communities.org

Twitter: @BlueCommunities | FaceBook: @BlueCommunitiesGCRF

Blue Communities

Outline:

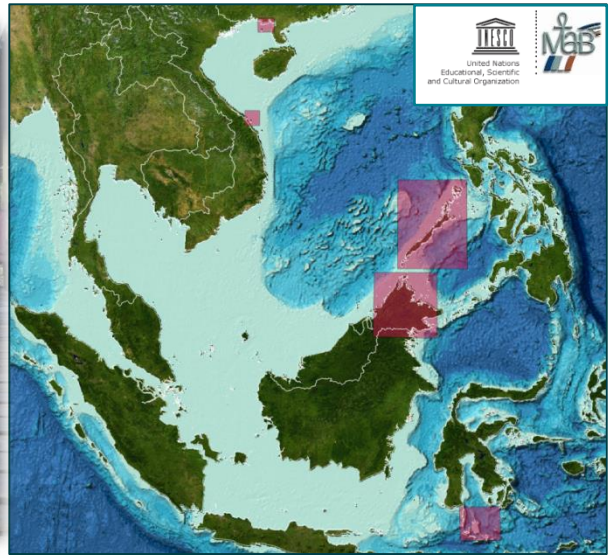
Blue Communities Interdisciplinary research

- The marine planning challenge
- Underpinning research approaches
- Interdisciplinary ecosystem service and natural capital approach to support decisions - to bring in and consider the environmental externalities and trade-offs in an economic and social setting
- Linking the disciplines to develop decision support tools

Blue Communities

GCRF Blue Communities

Building capability for marine planning in SE Asia: because actively, well-managed marine ecosystems are better able to support the health, wellbeing, food security and livelihoods of people



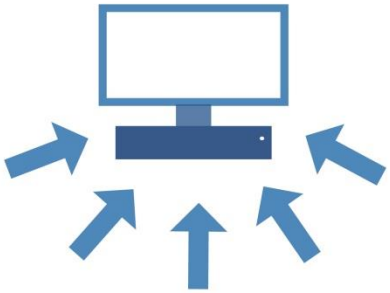
Why are we doing this?

? Capacity to implement marine planning throughout E and SE Asia is needed

Marine Spatial Planning - an approach to determine where each economic sector* may act in the marine environment to exploit its natural resources, taking into consideration their distribution, trade-off between sectors, sharing of space and the economic, ecological and social impacts of these activities.

Overarching challenge: to improve the integrated management of marine and coastal environments

- reduce conflict between users,
- mitigate risks associated with expanded or new uses,
- and protect fragile ecosystems
- while supporting livelihoods, food security, health and well-being of coastal communities

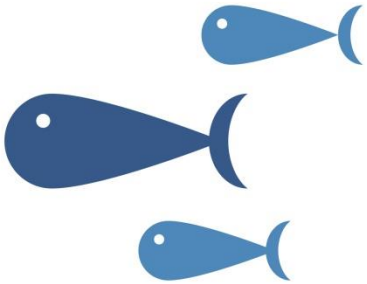


Evidence synthesis

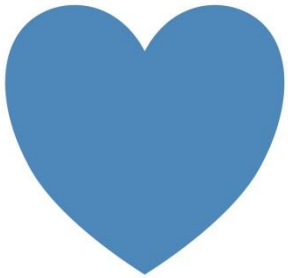
Critical analysis of marine planning model applications

Impacts on ecosystem services and values

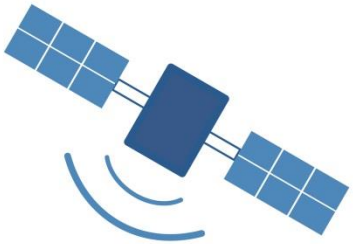
Marine renewable energy



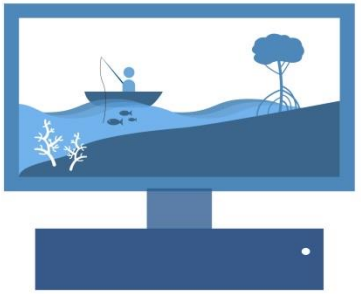
Small-scale coastal tuna fisheries management



Well-being benefits and risks of coastal living

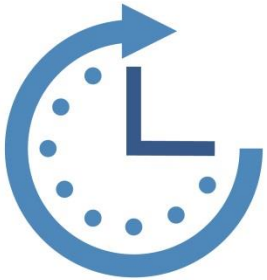


Earth observation approaches



Ecosystem service trade-offs

Principles and approaches to decision making



Future scenarios of changes in resources

Ecosystem level policy and management options

Systematic scenario planning

Critical analysis of marine planning model applications

Critical analysis of the current application of different models of marine planning. This is considering how marine planning can add value to existing investments in governance, management and planning approaches, as well as supporting future trends and aspirations.

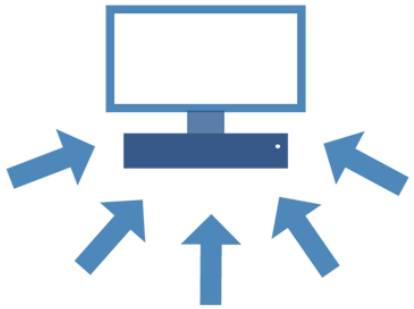
Principles and approaches to decision making

Analysis of ecosystem service and wellbeing trade offs arising from marine planning to consequently co-design with stakeholders the generic principles and approaches to making the hard political and ethical decisions about acceptable trade-offs

Health and Wellbeing

Evidence Synthesis

Evidence mapping and systematic reviews on the interconnections between marine conservation/ management and human health and wellbeing



Wellbeing benefits and risks of coastal living

Developing a database of how use of the marine environment may be affecting the health and wellbeing of local coastal populations including locally administered surveys

Developing approaches to improve access to and uptake of health services by coastal communities reliant on fisheries, and strengthen community understanding of the links between human and ecosystem health

Ecosystem services and decision support

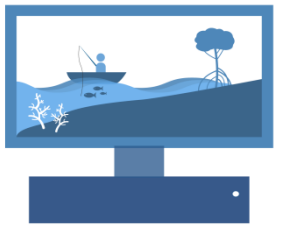
Synthesis of knowledge on current impacts on ecosystems and services

Synthesising existing data to understand the current social, economic and environmental conditions of case study sites and how they are utilised by local communities and businesses

- Providing baseline evidence for marine planning
- Identifying evidence gaps needed for effective marine planning

Decision Support Tools

Developing Bayesian Belief Networks as decision support tools that can provide spatially explicit representations of the ecosystem service trade-offs associated with different management options



Models of the Future situation

Future scenarios of changes in resources

Models are being developed and applied to project the long-term productive capacity of marine fisheries under climate and fisheries management scenarios

Ecosystem level policy and management options

Analysis to understand how climate change may impact living marine resources and what consequences or opportunities this may bring to associated economic sectors and marine conservation in each area.

The key aim is to deliver an analysis that can support adaptive, climate-ready ecosystem level policy and management options including marine spatial planning.

Alternative Future Scenarios

Systematic scenario planning

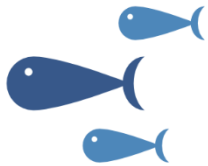
Bring together climate, ecological and social data to produce a range of scenarios. These will be used as a discussion and communication tool to explore impacts (benefits and risks) of development and communicate with relevant stakeholders about desired outcomes and management.

Applications and tools

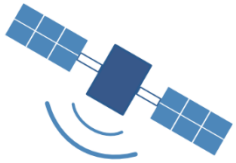
Marine Renewable Energy & Impact Assessment

Developing holistic approaches to feasibility and impact assessment, to inform plans for using low carbon energy to support sustainable development

Small-scale coastal tuna fisheries management



For small-scale coastal tuna fisheries: examining their governance and identifying derived social & economic benefits.



Earth observation approaches

Training and capacity building in the use of satellite Earth observation (EO) approaches for monitoring marine habitats, including for aquaculture (harmful algal blooms, spread of aquaculture)

Blue Communities

Keys to success in Blue Communities will be:

- ✓ Interaction, integration and synthesis
- ✓ Coordination of training
- ✓ Coordination of stakeholder engagement

…. Across all Projects

These are being revisited iteratively throughout the programme

Blue Communities

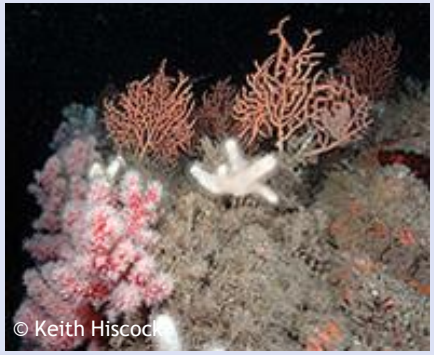
Natural Capital & Ecosystem Services

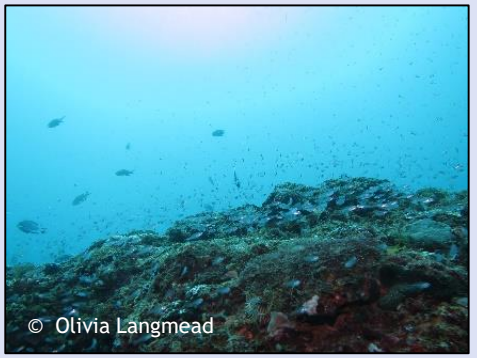
Natural Capital

Our environmental **assets**: the ocean, land, freshwater, air, the species and habitats they contain..

Stocks

.. the **processes and functions** that occur within them.





Blue Communities

Natural Capital & Ecosystem Services

Natural Capital

Our environmental **assets**: the ocean, land, freshwater, air, the species and habitats they contain..

.. the **processes and functions** that occur within them.

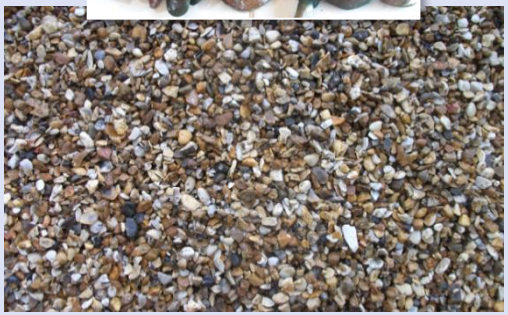
Ecosystem services

Flows

The components of the natural environment that are directly useful to us.

Ecosystem services are grouped into three categories:

Provisioning: Food and raw materials



Natural Capital & Ecosystem Services

Natural Capital

Our environmental **assets**: the ocean, land, freshwater, air, the species and habitats they contain..

.. the **processes and functions** that occur within them.

Ecosystem services

The components of the natural environment that are directly useful to us.

Ecosystem services are grouped into three categories:

Provisioning: Food and raw materials

Regulating: Protection from harm and extreme events (e.g. climate regulation, flood protection, waste removal)

Natural Capital & Ecosystem Services

Natural Capital

Our environmental **assets**: the ocean, land, freshwater, air, the species and habitats they contain..

.. the **processes and functions** that occur within them.

Ecosystem services

The components of the natural environment that are directly useful to us.

Ecosystem services are grouped into three categories:

Provisioning: Food and raw materials

Regulating: Protection from harm and extreme events (e.g. climate regulation, flood protection, waste removal)

Cultural: The way environmental interaction shapes our experiences (e.g. recreation, inspiration, heritage)

Blue Communities

Natural Capital & Ecosystem Services

Natural Capital

Our environmental **assets**: the ocean, land, freshwater, air, the species and habitats they contain..

.. the **processes and functions** that occur within them.

Ecosystem services

The components of the natural environment that are directly useful to us.

Ecosystem services are grouped into three categories:

Provisioning: Food and raw materials

Regulating: Protection from harm and extreme events (e.g. climate regulation, flood protection, waste removal)

Cultural: The way environmental interaction shapes our experiences (e.g. recreation, inspiration, heritage)

Goods and Benefits

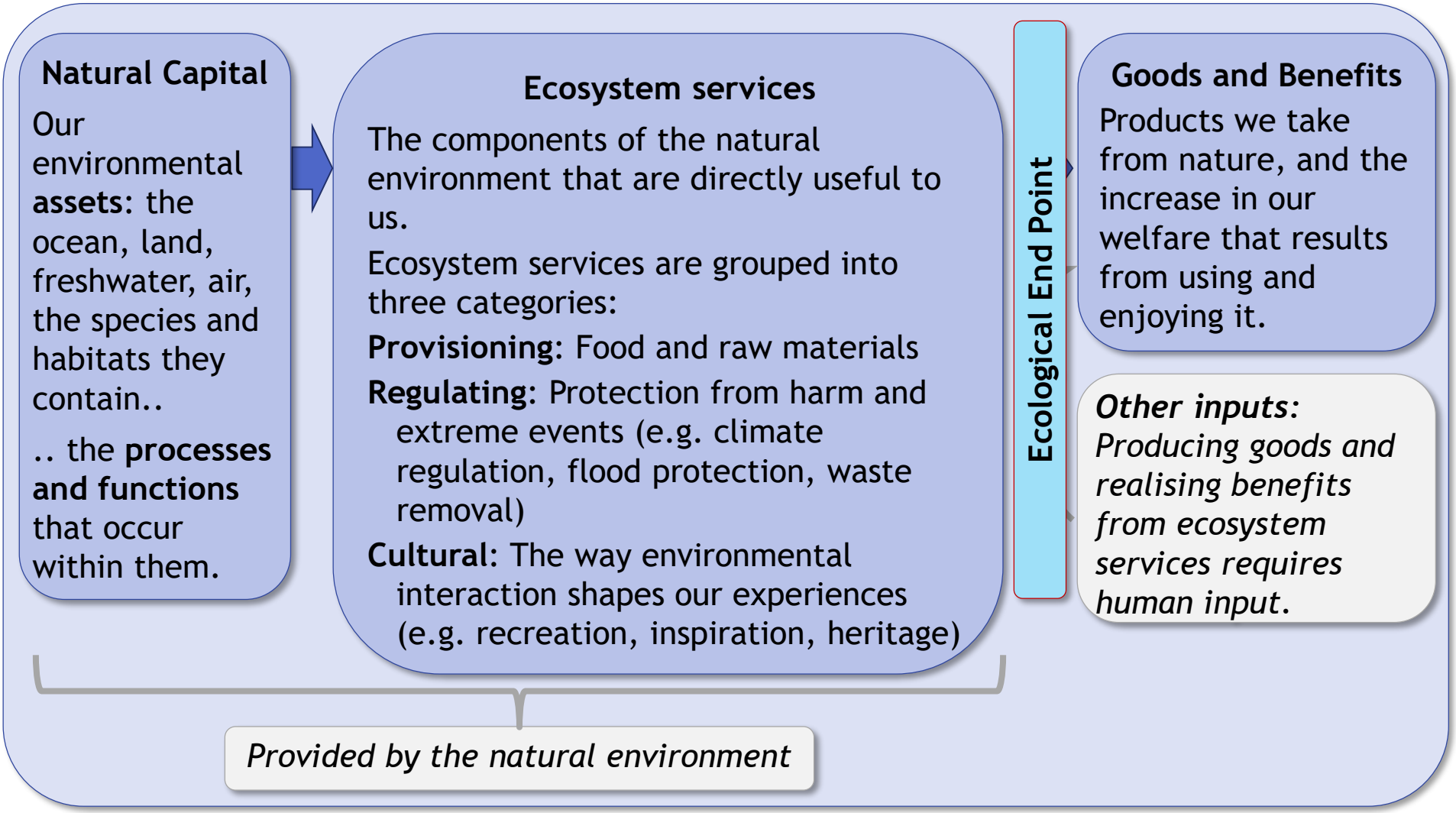
Products we take from nature, and the increase in our welfare that results from using and enjoying it.

Other inputs:
Producing goods and realising benefits from ecosystem services requires human input.

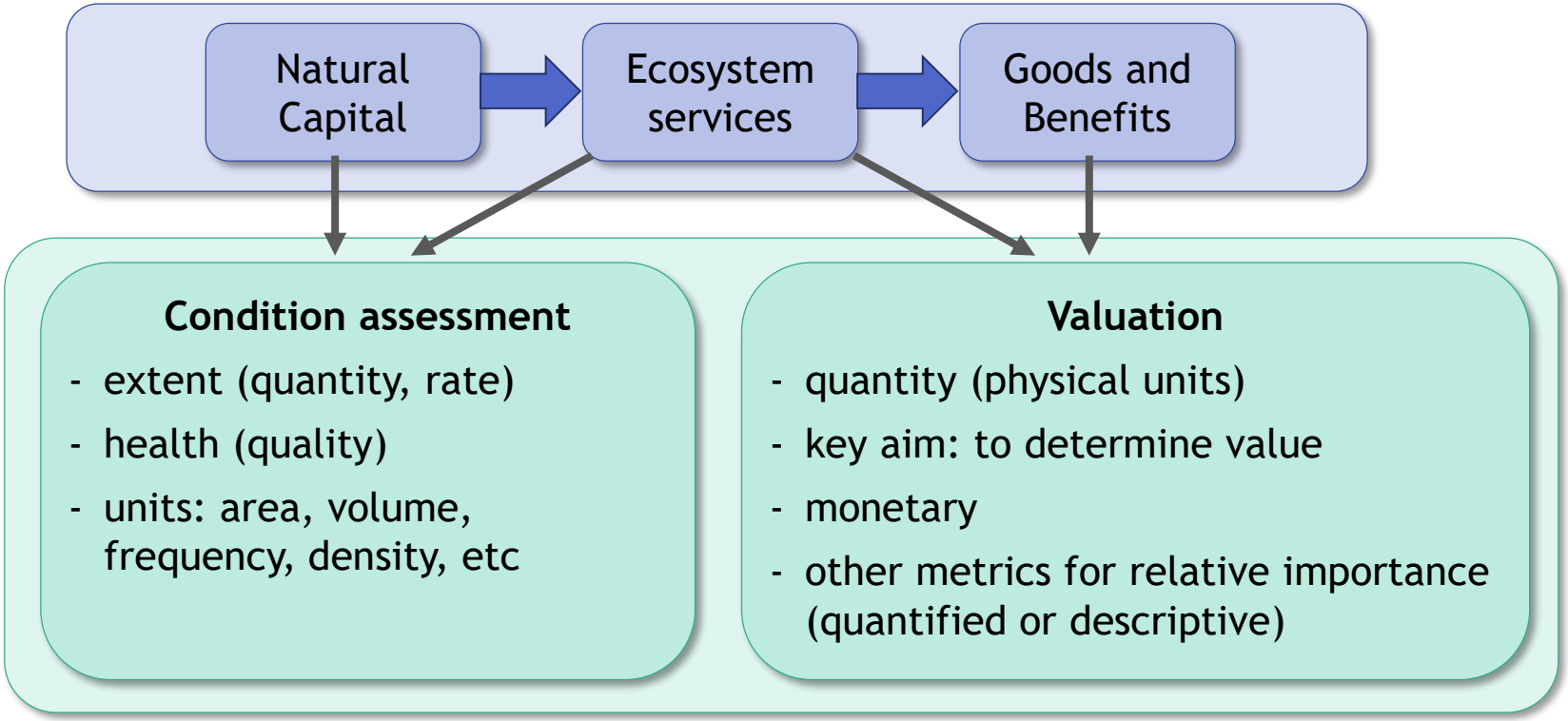
Provided by the natural environment

Blue Communities

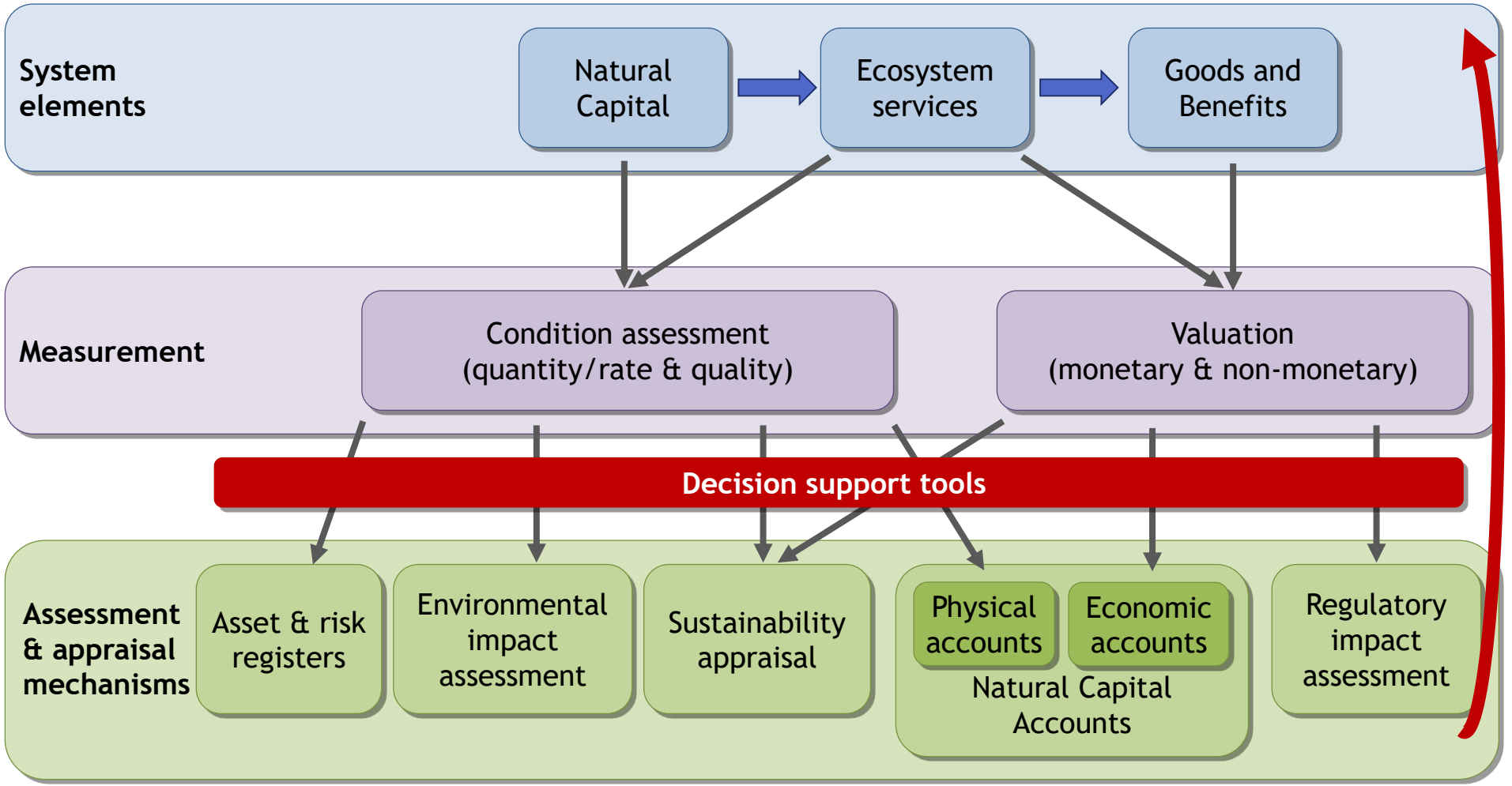
Natural Capital & Ecosystem Services



Why the distinctions are important

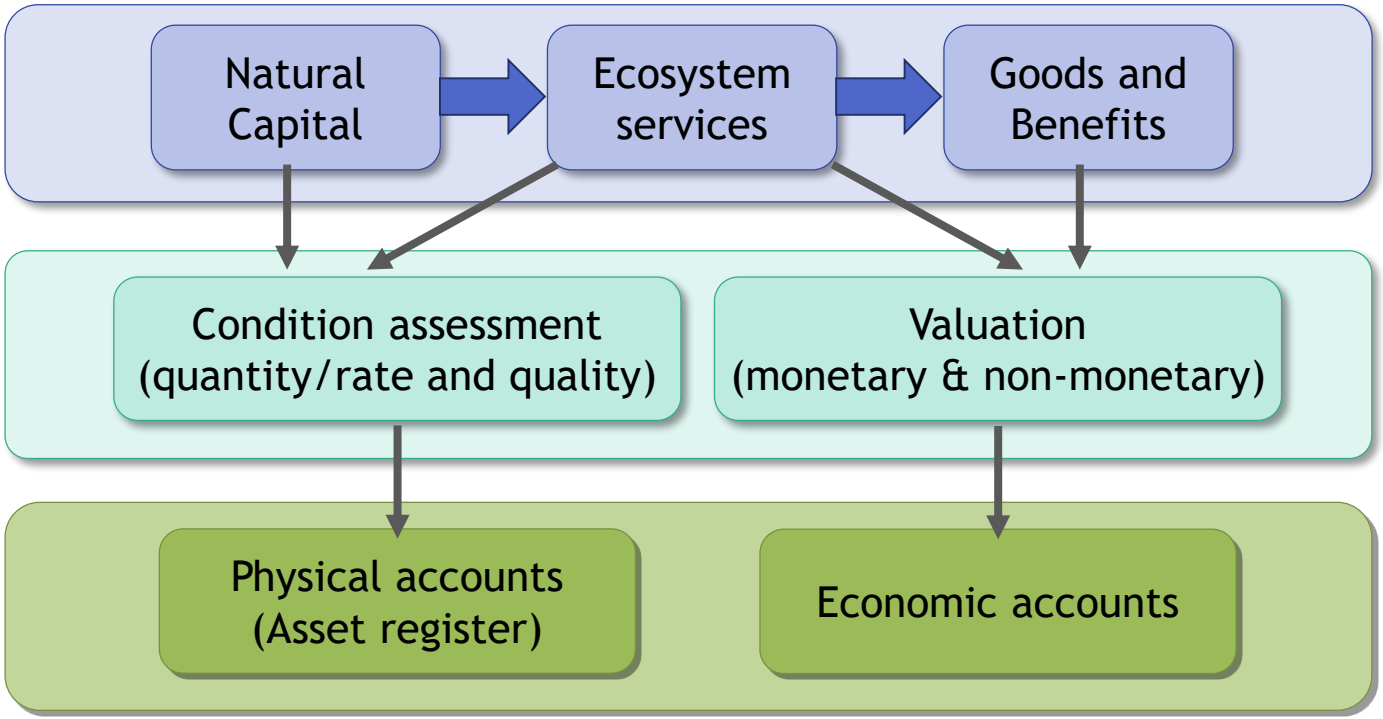


Using the Approach in Decision Support



Natural Capital Accounts

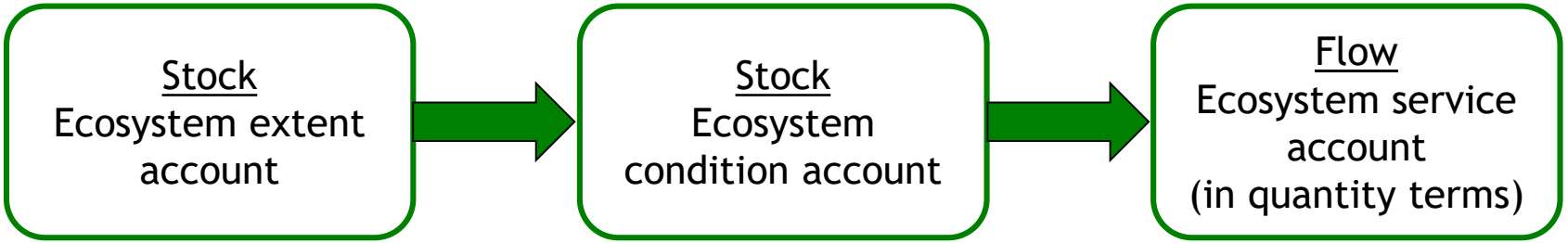
*""Enabling organisations to gather **natural capital information** in a **coherent and comparable format** will help both **companies** and **policy-makers** to make **better informed decisions** about the management of natural capital assets."*



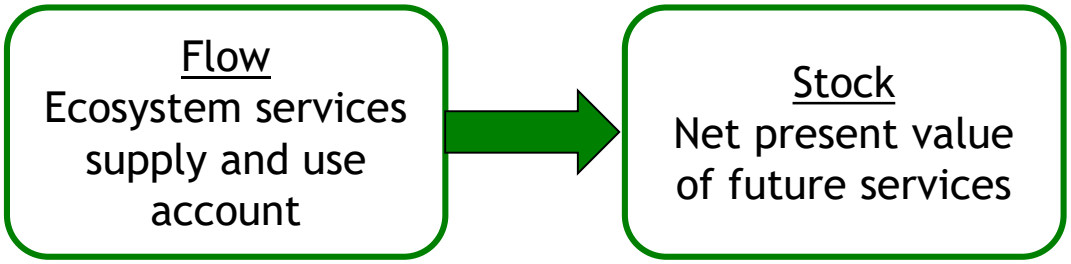
Natural Capital Accounts

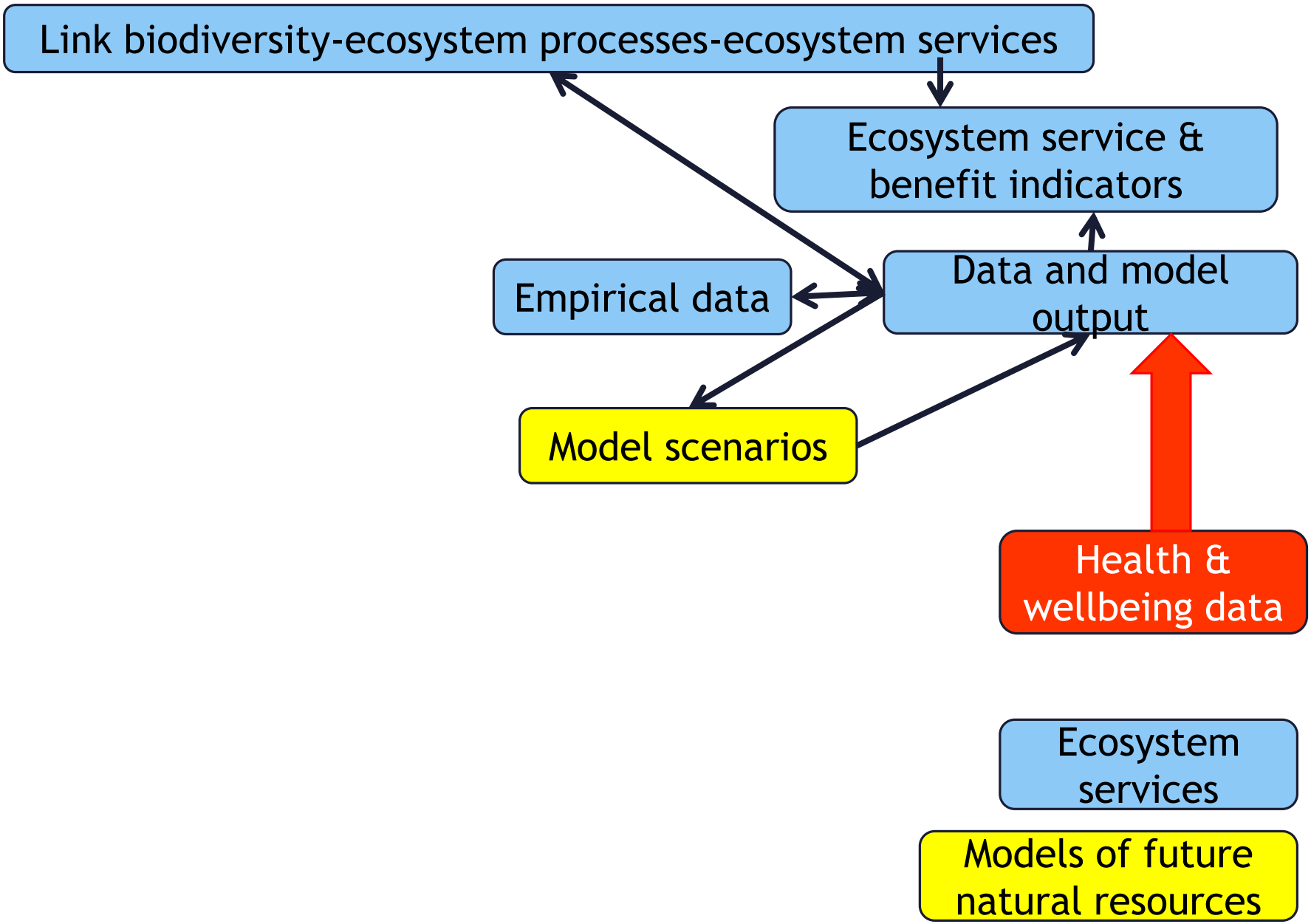
*"A tool to **measure the changes** in the stock and condition of natural capital at a variety of scales and to **integrate the value** of ecosystem services into **accounting and reporting systems**."*

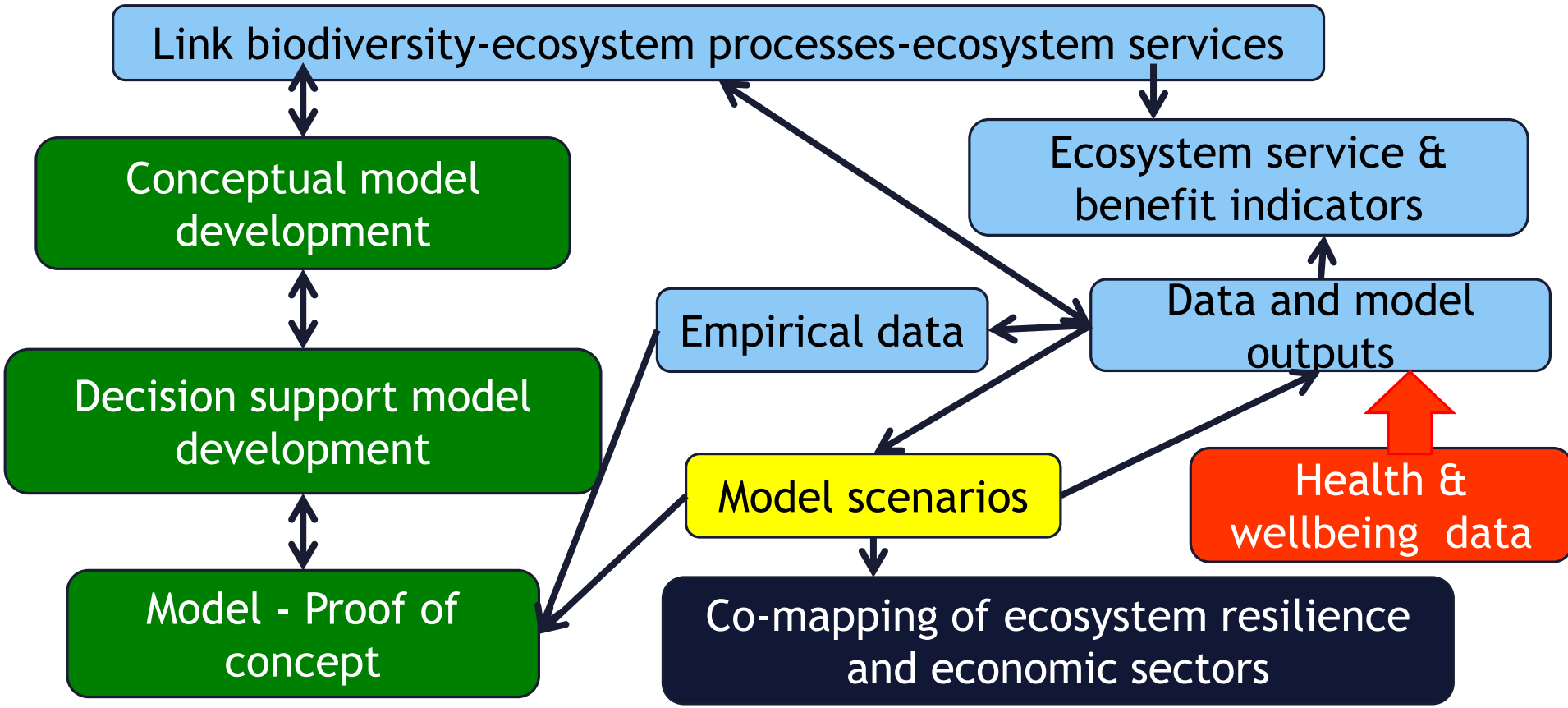
***Physical** : classify and record measures of extent, condition and annual service flow.*



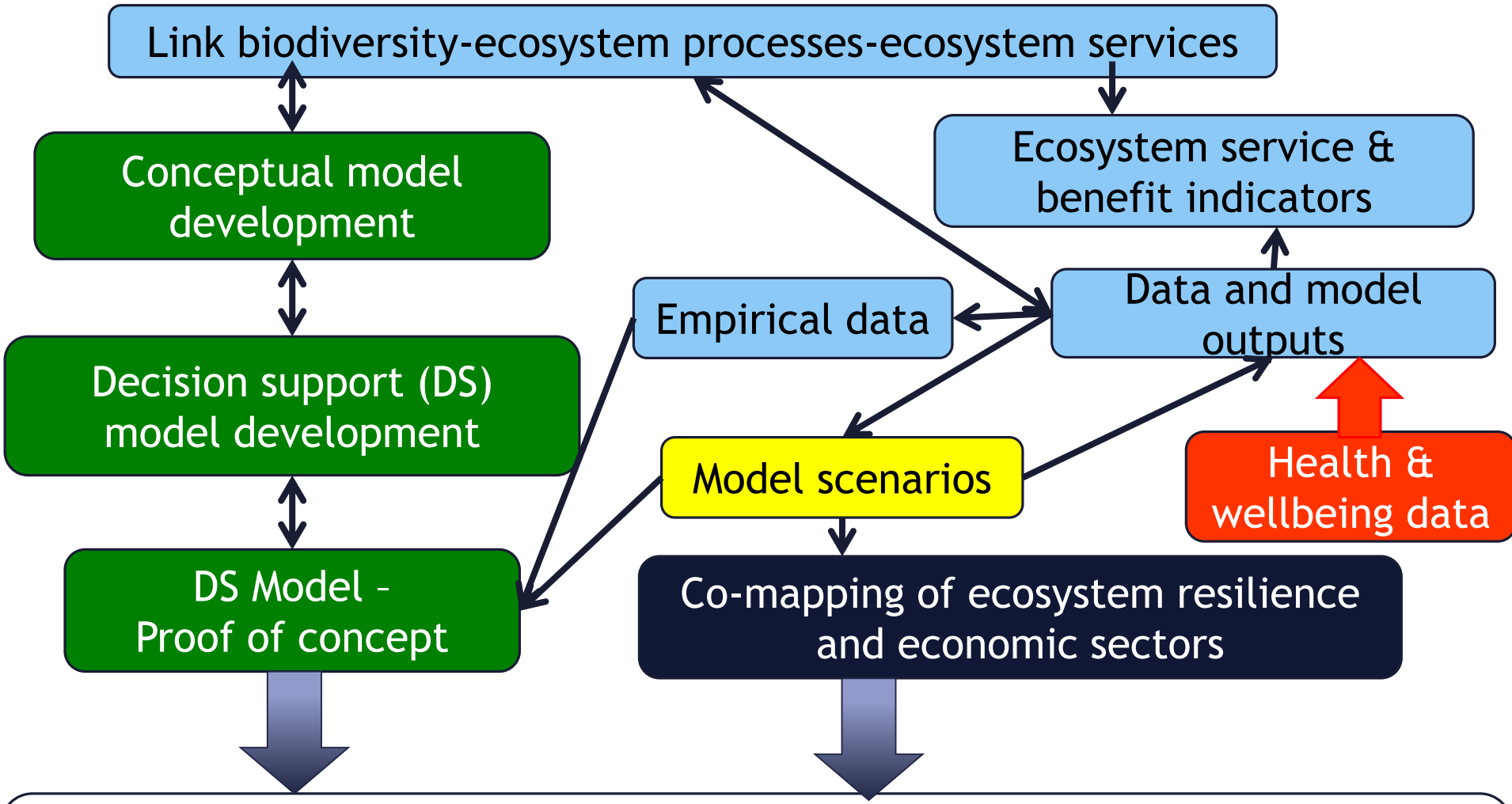
***Monetary** : assign a monetary valuation to selected services on an annual basis and record an overall valuation of the natural asset's ability to generate future service flows.*




Link biodiversity-ecosystem processes-ecosystem services
Ecosystem service & benefit indicators
Empirical data
Data and model output
Model scenarios
Health & wellbeing data
Ecosystem services
Models of future natural resources



Ecosystem services | Models of future natural resources | Decision Support Tools | Ecosystem level policy & management options



- Key processes and biodiversity elements
- Future projections of all ecosystem services under management/policy scenarios
- Future planning

Blue Communities

GCRF Blue Communities

Building capability for marine planning in SE Asia: because actively, well-managed marine ecosystems are better able to support the health, wellbeing, food security and livelihoods of people