

# Ocean Accounts

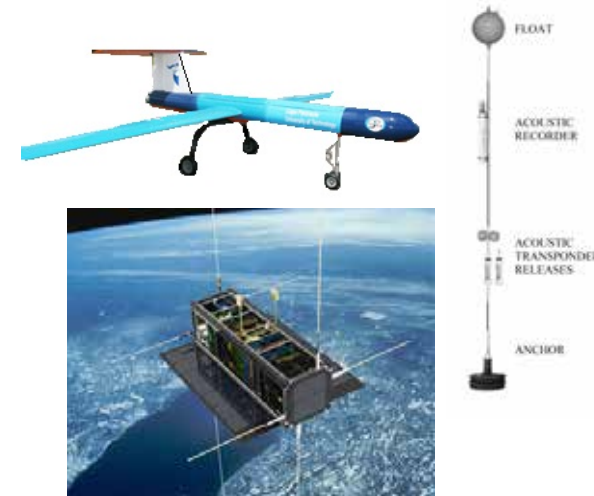
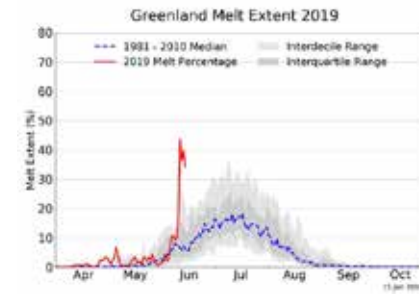


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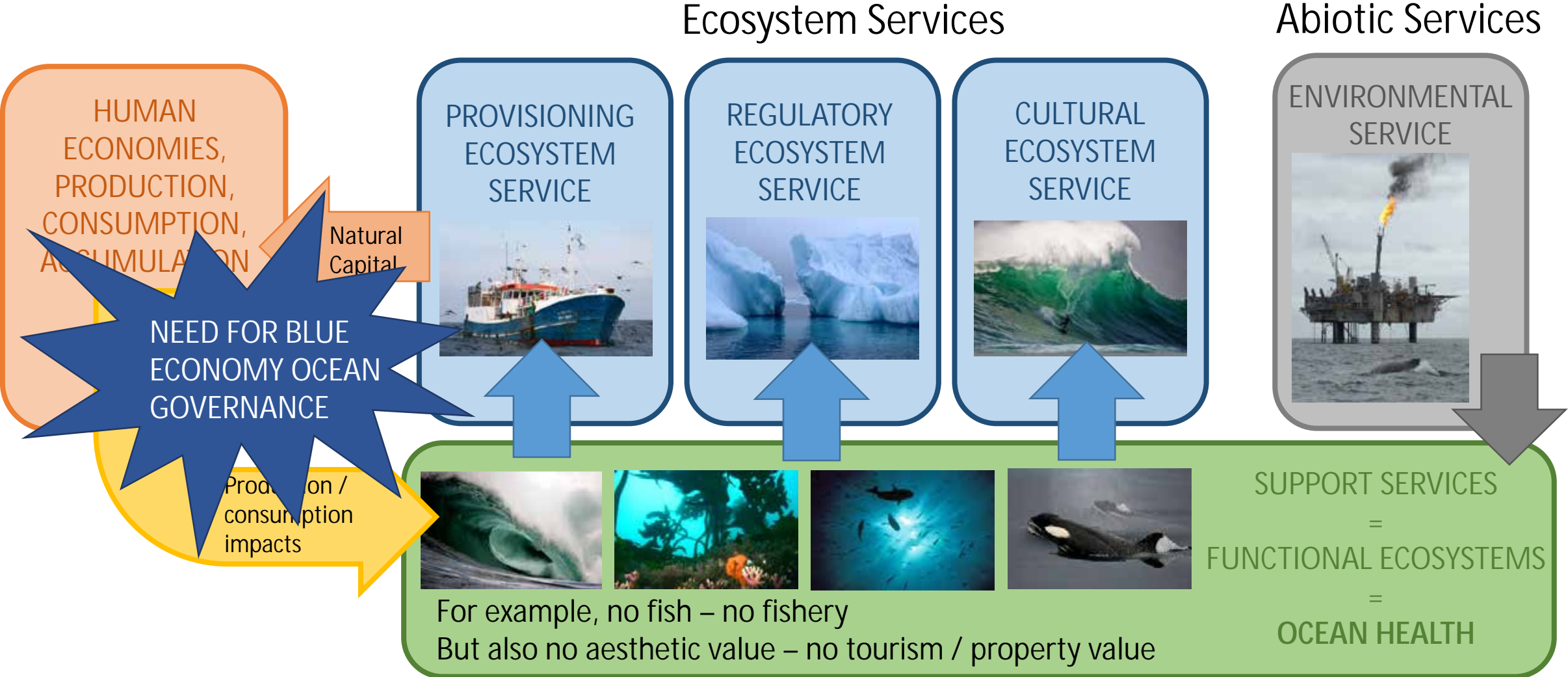
# Sea Change

1. **Oceans are Changing** - temperature; acidification; deoxygenation; circulation and chemistry, sea levels; increased storm intensity; diversity and abundance of marine species
2. **Ocean Use is Changing** - Global increases in Ocean Economies and Blue Economies\* as nations or regions turn to new opportunities to foster economic growth and ensure food and energy security.
3. **Ocean Measurement and Monitoring is Changing** - 4IR; Ocean Robotics; Remote Sensing; Direct Sampling; Big Data; Analyses and Modelling; Machine Learning; Automated Analytics
4. **Ocean Governance** (or more correctly governance of the human use of ocean resources) needs to account for such changes

\* **Blue Economy** – here taken to mean inclusion of sustainability, equity and equitable access and inclusivity within ocean economy governance models and policy.



# Ocean Use: Humans derive numerous benefits from ocean systems through Ecosystem and Environmental Services



There are global expansions of Ocean Economies.

Maximising utility through allocation of scarce resources in the **production, consumption and accumulation** of wealth. Production factors obviously include Land, Labour, Capital and Entrepreneurship.

Valuation of Ocean Economies (largely GVA derived) are fraught within inconsistencies.

Often difficult to define Land Production Factor in Ocean Economies given ocean dynamics, fluidity, boundary porosity, resource commons and 3D nature of ocean space.

Spatial Conflicts between 1) competing Sectors and 2) Sectors and the Environment in both production and consumption (the “externalities”).

Governance of Conflicts requires Spatial Trade- Offs in policy development

Ecological governance - “a process of **informed** decision-making that enables **trade-offs** between competing resource users so as to **balance environmental protection with beneficial use** in such a way as to mitigate conflict, enhance equity, ensure sustainability and allow accountability”  
Turton *et al.* 2007

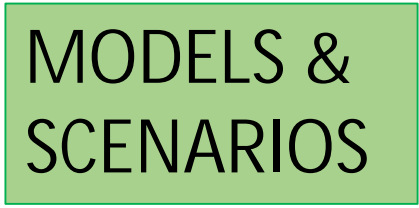
Trade-Offs require valuations (across nested environmental social and economic domains)

# GOVERNMENT

Rule Making  
Rule Implementation  
Rule Adjudication

# POLICY & GOVERNANCE

# SOCIETY

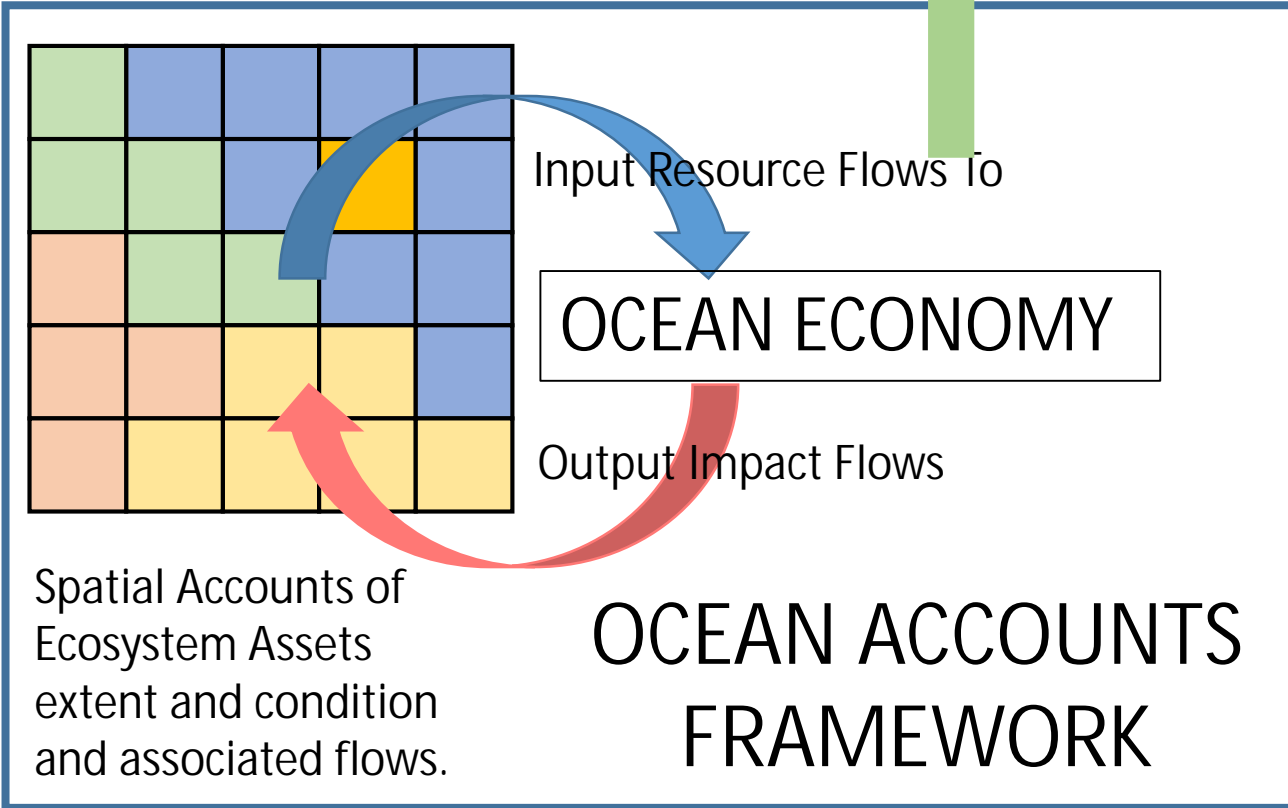


## OCEAN DATA

4IR IN OCEAN SCIENCES  
Large Volumes of New Data

Ocean Robotics  
Remote Sensing  
Direct Sampling  
Big Data  
Analyses and Modelling  
Machine Learning  
Automated Analytics

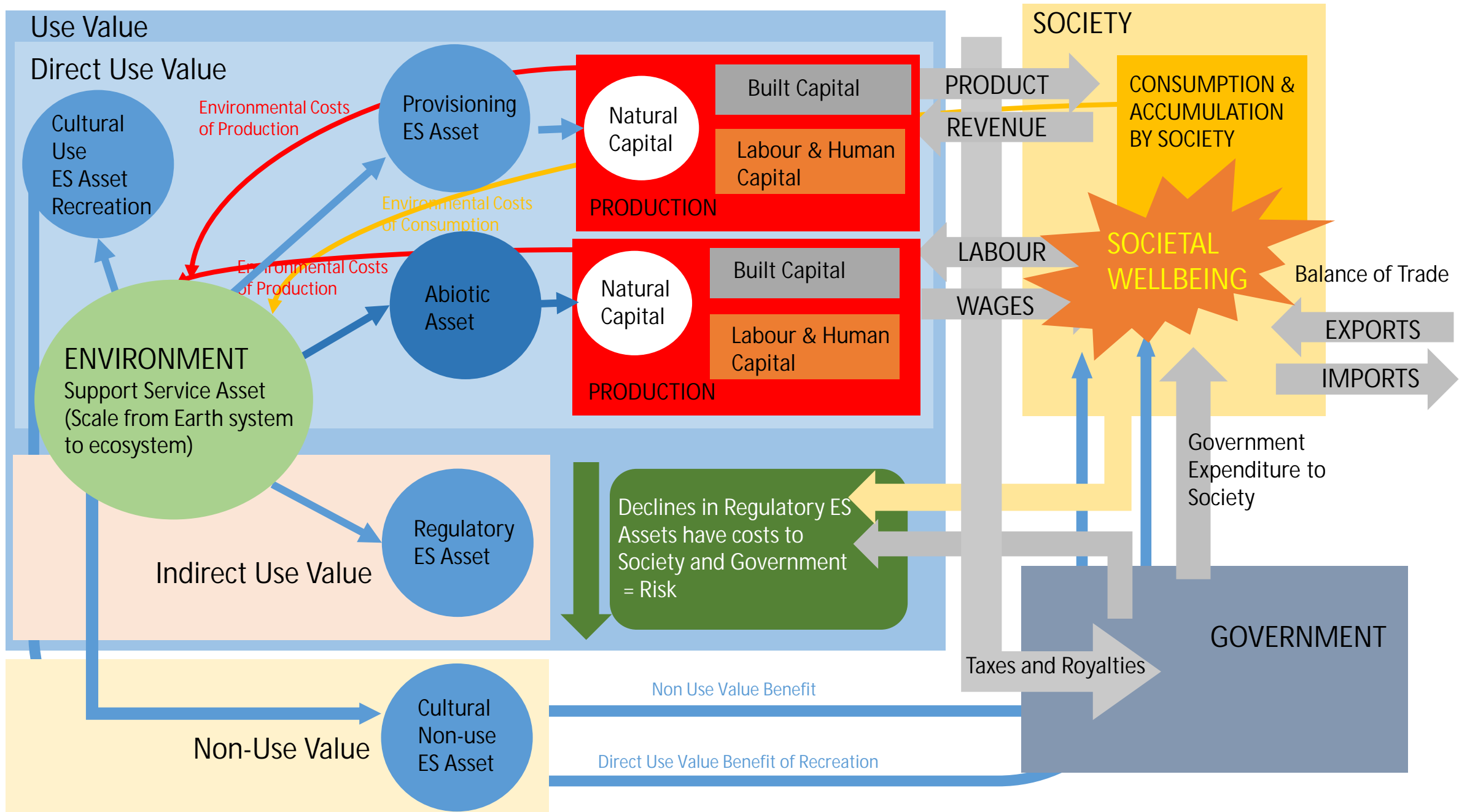
- Oceanography
- Biodiversity
- Ecosystem Services and Abiotic Services
- Social Sciences
- Economic Sciences
- Risk Information
- Governance



OCEAN ECONOMY

OCEAN ACCOUNTS FRAMEWORK

# Ocean Accounts Framework is complex



<p><b>THE USE OF OCEAN ACCOUNTS TO UNDERPIN OCEAN ECONOMY MODELS</b></p>	<p><b>SYSTEM OF ENVIRONMENTAL ECONOMIC ACCOUNTS – SEEA – CF</b></p>	<p><b>SYSTEM OF NATIONAL ACCOUNTS</b></p> <p>ISIC Ocean Economic Activities</p>	<p><b>SOCIETAL ACCOUNTS</b></p> <p>Employment Tables</p> <p>Benefit and Costs Tables</p> <p>Economic Social Wellbeing Equity and Inclusivity</p>
<p><b>SYSTEM OF ENVIRONMENTAL ECONOMIC ACCOUNTS – EXPERIMENTAL ECOSYSTEM ACCOUNTING</b></p> <p>Ecosystem classification from biophysical data – <b>Ecosystem Tables</b></p> <p><b>Ecosystem extent and condition Tables as Ecosystem Asset Tables</b></p> <p><b>Ecosystem Service Asset Supply Tables</b></p>	<p><b>Ecosystem Service Input Tables</b> Natural Capital and ES inputs into Economy (Economic supply / ES Asset Use) Physical to Monetary</p> <p><b>Output (Residuals) Tables</b> Impacts of the Economy of the Environment</p> <p>Expenditures to Mitigate Impacts (from Governance Tables)</p>	<p>Production, Consumption, Accumulation, Balance of Trade</p> <p>Production, Income or Expenditure Approaches to measuring Ocean Contribution to GDP</p>	<p><b>NATIONAL WEALTH ACCOUNTS</b></p> <p>SNA and SEEA Balance Sheets Critical Natural Capital Assets Resource Sustainability</p>
	<p><b>SEEA – WATER, ENERGY AGRICULTURE, FORESTRY, FISHERIES</b> Sectoral detailed Tables</p>	<p><b>RISK ACCOUNTS</b></p> <p><b>SENDAI FRAMEWORK</b></p>	<p><b>GOVERNANCE ACCOUNTS</b> <b>Governance Tables</b> Protection and Management Laws and Regulations Taxes, Royalties and Subsidies Research, Technology and Innovation <b>Corporate Governance</b></p>

# OCEAN ACCOUNTS FRAMEWORK

Asset Extent and Condition

Stocks and Flows

Physical and Monetary Values

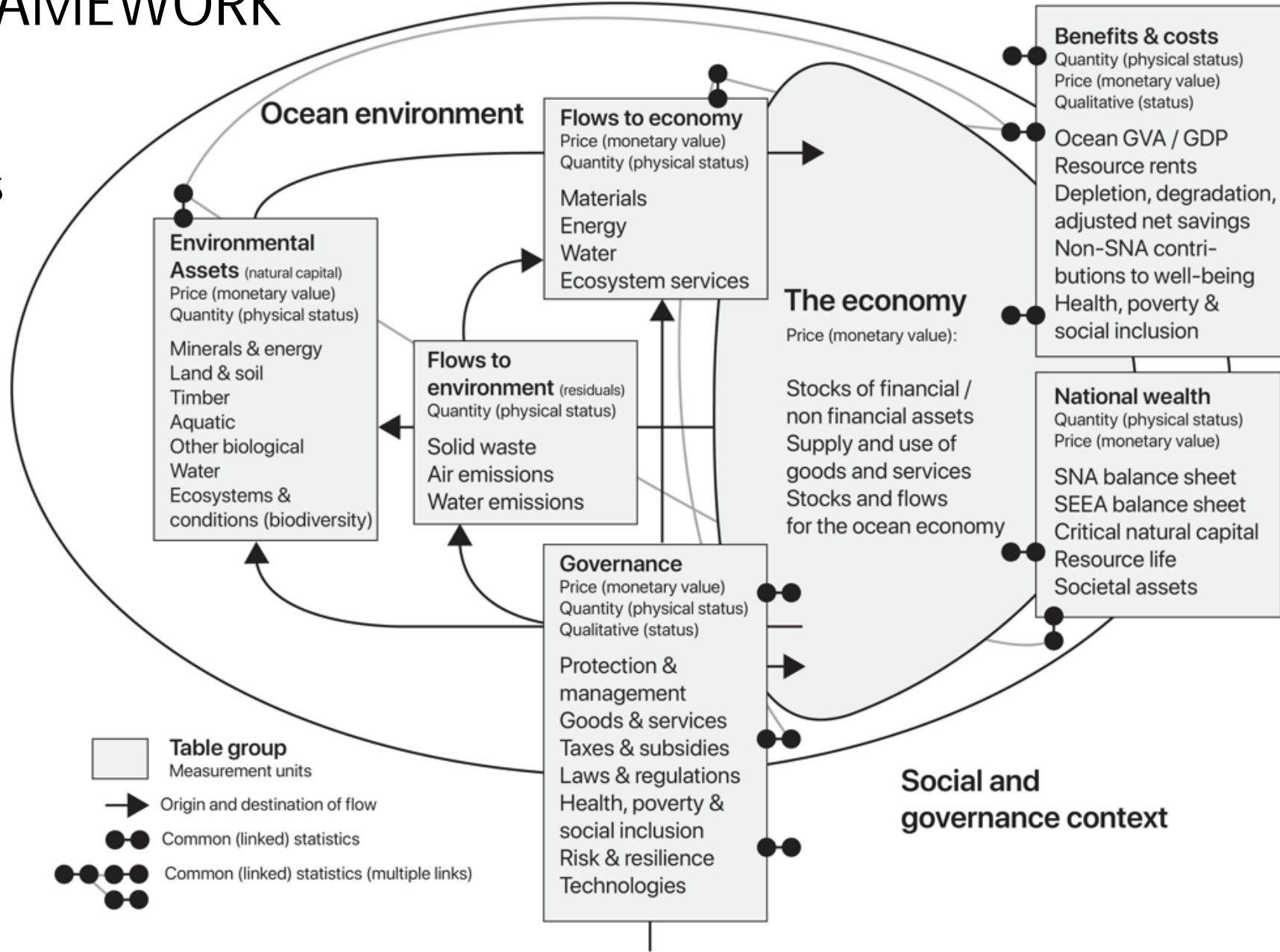



Figure 2. Detailed table structure of Ocean Accounts Framework







Thank You for your attention

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