How to satisfy industry and nature - the ability to create an integrated Estuarine Planning Support System (*or* Nature protection - *bête noire* or *raison d'être!)*

Professor Dr Mike Elliott[1],

With Sue Boyes[1], Jemma-Anne Lonsdale[1,2], Lindsay Ibbetson[1] and Steve Barnard[1]

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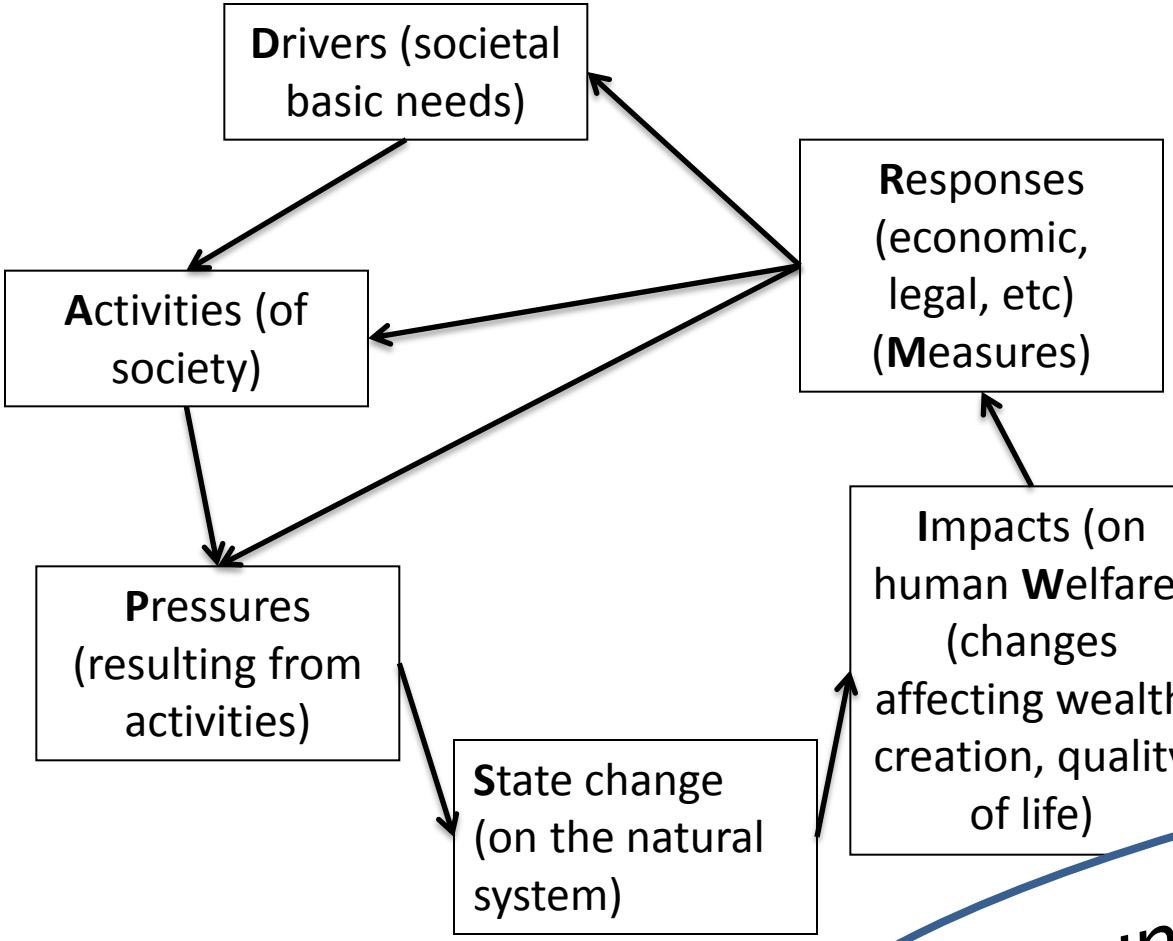
DAPSI(W)R(M) framework



(for each EnMP cf. Ex

Pronounced "dapsiworm"!

Marine Pollution Bulletin 86 (2014) 1–4
Contents lists available at ScienceDirect
Marine Pollution Bulletin
journal homepage: www.elsevier.com/locate/marpolbul

Editorial

Integrated marine science and management: Wading through the morass

Ecological Economics 128 (2016) 55–67
Contents lists available at ScienceDirect
Ecological Economics
journal homepage: www.elsevier.com/locate/ecolecon

Analysis

Processes for the sustainable stewardship of marine environments

Henrik Scharin [a,b,*], Siv Ericsdotter [a], Michael Elliott [c], R. Kerry Turner [d], Susa Niiranen [a], Thorsten Blenckner [a], Kari Hyytiäinen [e], Lassi Ahlvik [f], Heini Ahtiainen [f], Janne Artell [f], Linus Hasselström [g], Tore Söderqvist [h], Johan Rockström [a]

frontiers in Marine Science
REVIEW
published: 14 September 2016
doi: 10.3389/fmars.2016.00177

DPSIR—Two Decades of Trying to Develop a Unifying Framework for Marine Environmental Management?

Joana Patrício [1], Michael Elliott [2], Krysia Mazik [2], Konstantia-Nadia Papadopoulou [3] and Christopher J. Smith [3]*

frontiers in Marine Science
REVIEW
published: 05 August 2016
doi: 10.3389/fmars.2016.00144

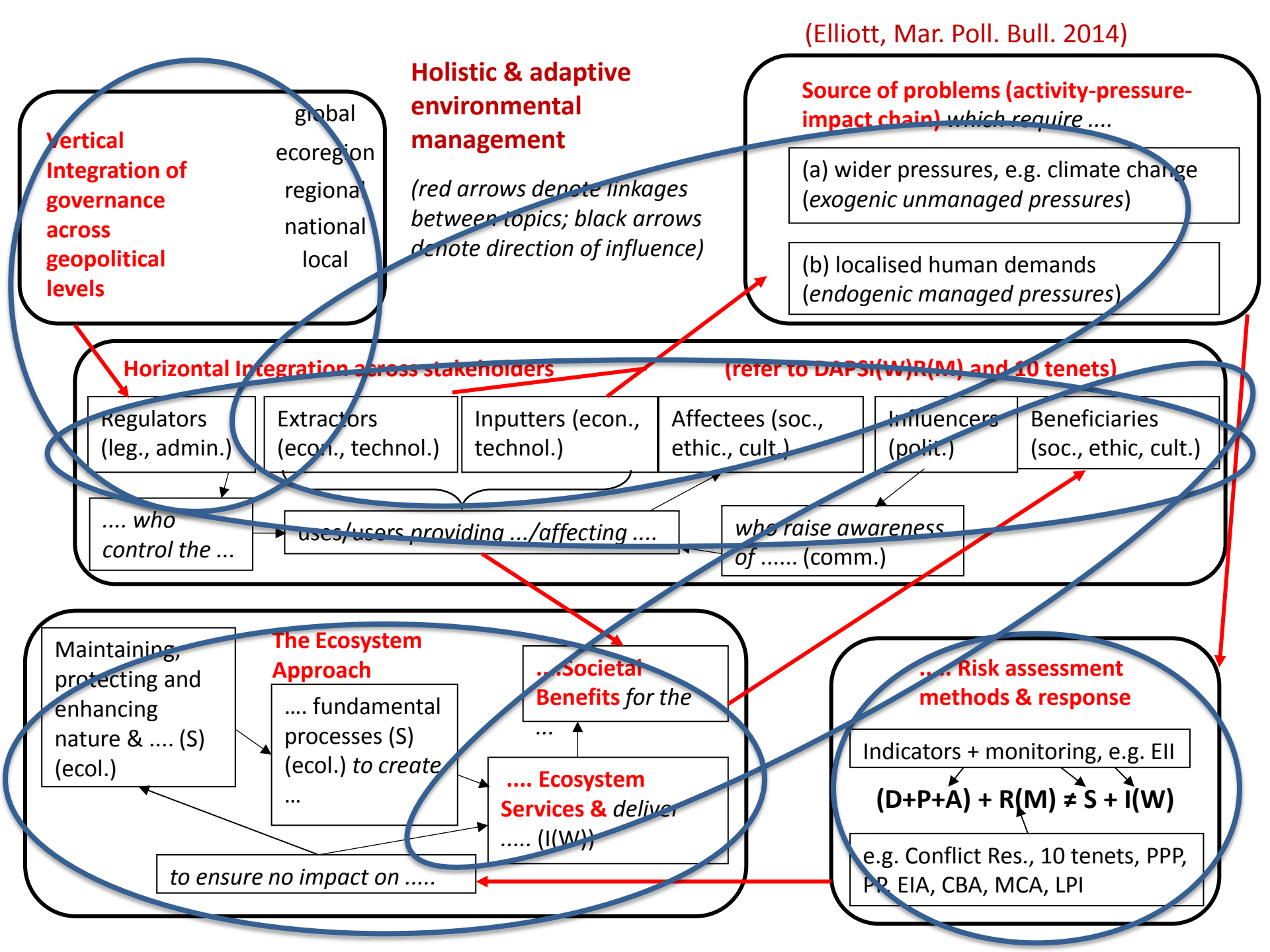
Managing the Marine Environment, Conceptual Models and Assessment Considerations for the European Marine Strate... Directive

651–655
Contents lists available at ScienceDirect
Marine Pollution Bulletin
journal homepage: www.elsevier.com/locate/marpolbul

Editorial

Marine science and management means tackling exogenic unmanaged pressures and endogenic managed pressures – A numbered guide

(Elliott, Mar. Poll. Bull. 2014)



The 10-tenets:

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To be successful, management measures or responses to changes resulting from human activities should be:

- Ecologically sustainable
- Technologically feasible
- Economically viable
- Socially desirable/tolerable
- Legally permissible
- Administratively achievable
- Politically expedient
- Ethically defensible (morally correct)
- Culturally inclusive
- Effectively communicable

The UK and Marine Scotland vision: "*clean, healthy, safe, productive, biologically diverse marine and coastal environments, managed to meet the long-term needs of people and nature*".


Marine Pollution Bulletin 74 (2013) 1–5

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Marine Pollution Bulletin

journal homepage: www.elsevier.com/locate/marpolbul

Editorial

The *10-tenets* for integrated, successful and sustainable marine management


ENVIRONMENTAL SCIENCE & POLICY 51 (2015) 181–191

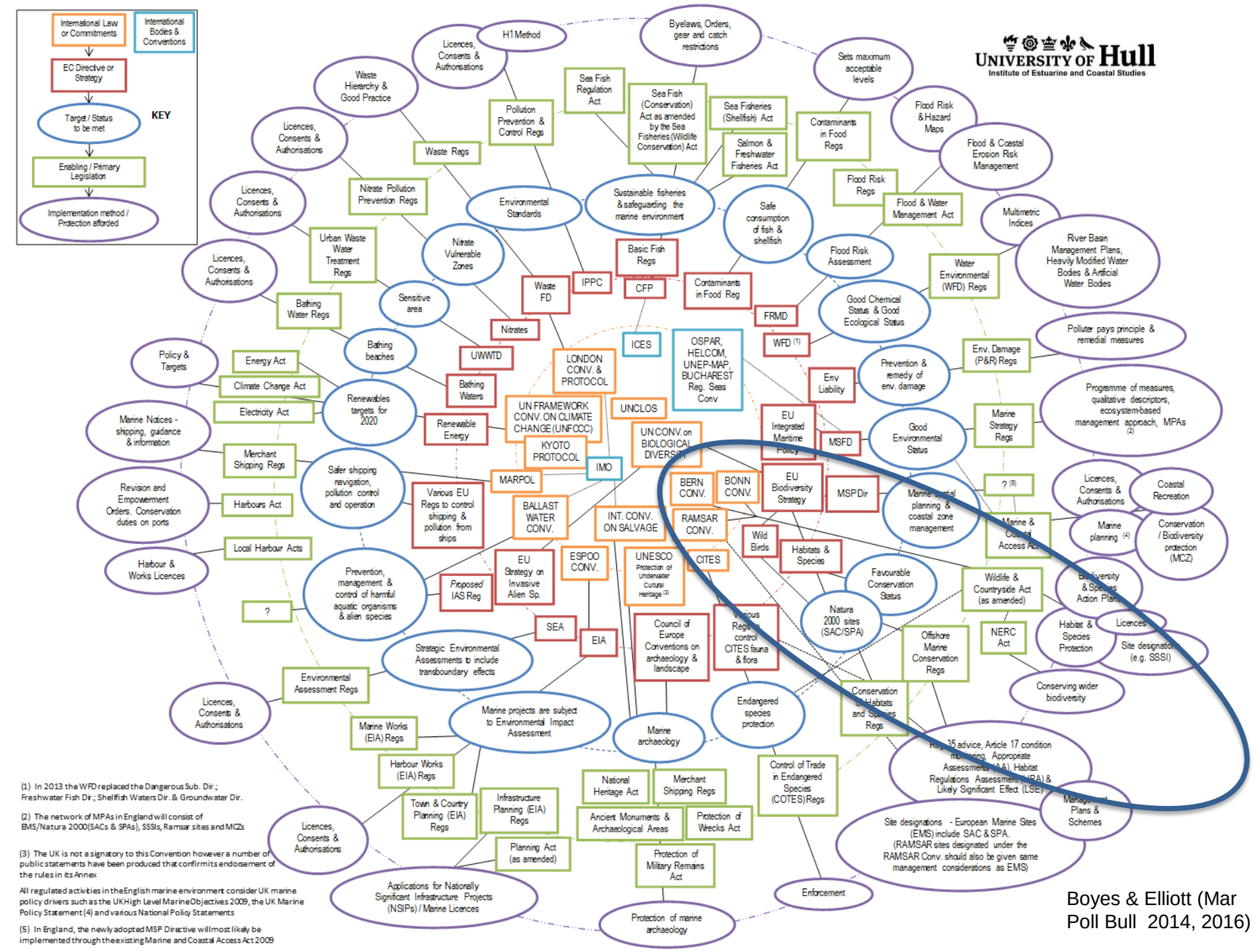
Available online at www.sciencedirect.com

ScienceDirect

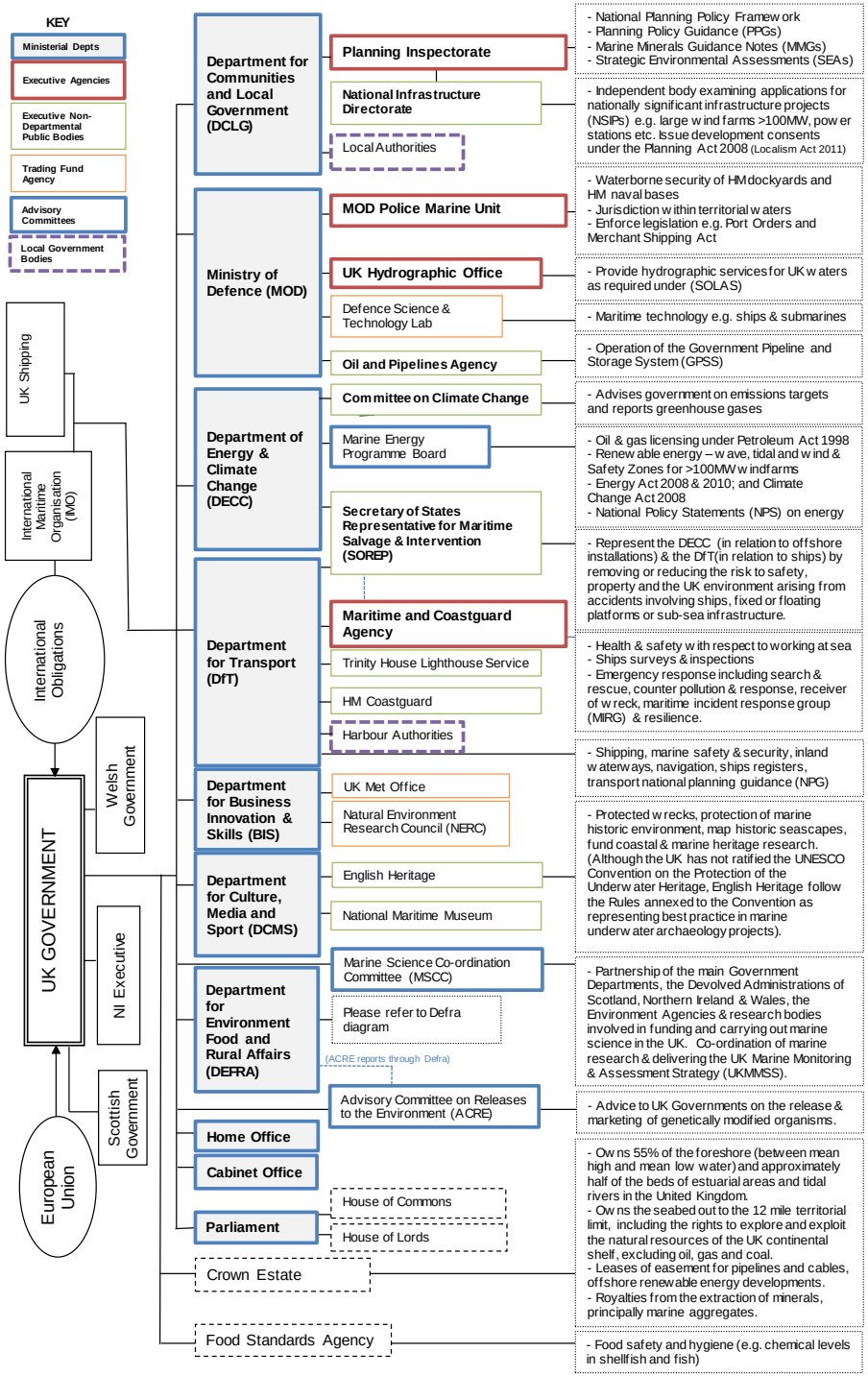
journal homepage: www.elsevier.com/locate/envsci

The 10-tenets of adaptive management and sustainability: An holistic framework for understanding and managing the socio-ecological system

Steve Barnard *, *Michael Elliott*



Boyes & Elliott (Mar Poll Bull 2014, 2016)



Post '*Brexit*':

Department for Business, innovation and Skills (BIS)

Department of Energy and Climate Change (DECC)

have now become:

Department for Business, Energy and Industrial Strategy (BEIS)

Marine Policy 51 (2015) 57–65

Contents lists available at ScienceDirect

Marine Policy

journal homepage: www.elsevier.com/locate/marpol

The excessive complexity of national marine governance systems – Has this decreased in England since the introduction of the Marine and Coastal Access Act 2009?

Suzanne J. Boyes *[,1], Michael Elliott [1]

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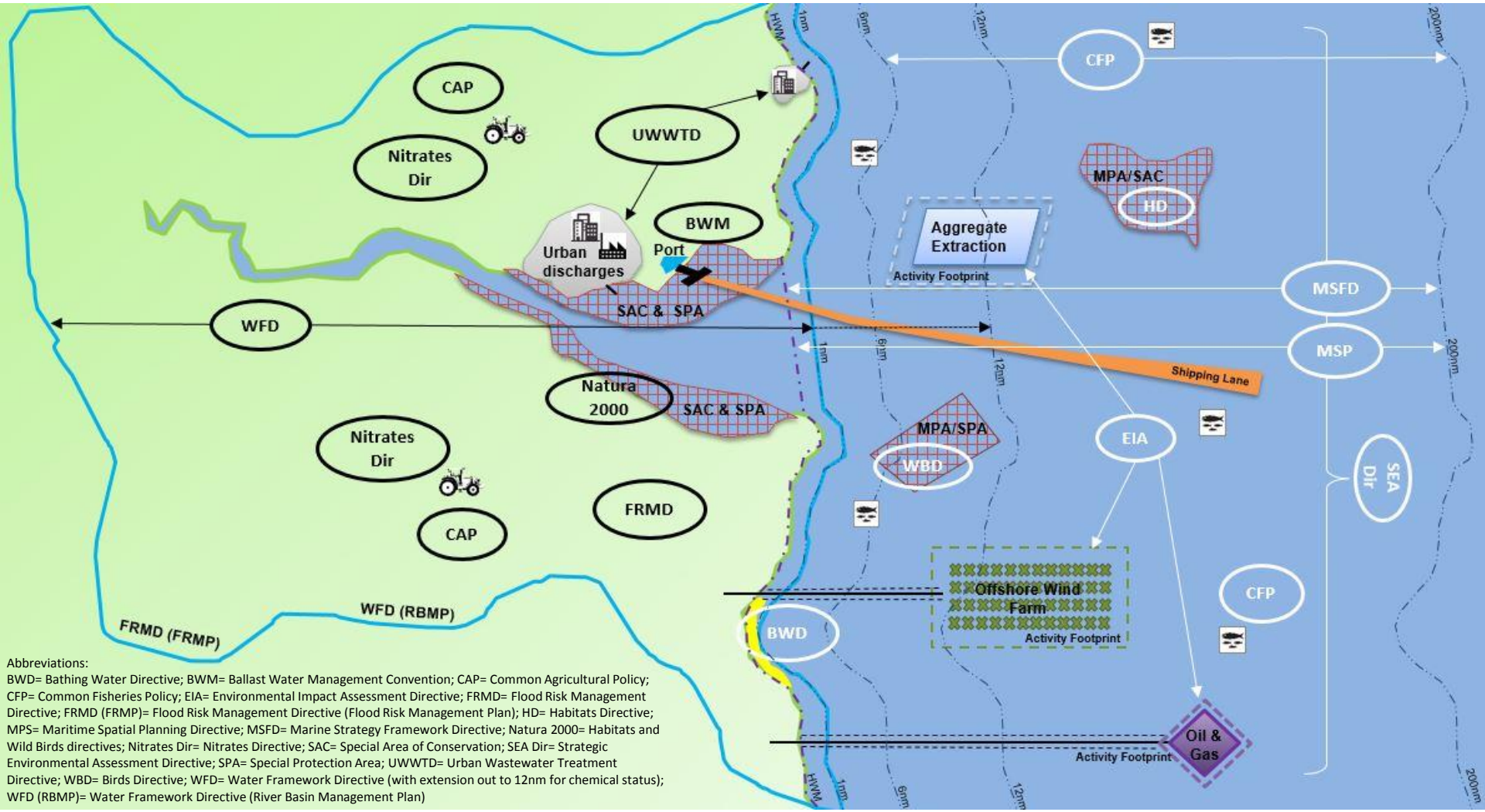
Marine Pollution Bulletin

journal homepage: www.elsevier.com/locate/marpolbul

Viewpoint

Brexit: The marine governance horrendogram just got more horrendous!

Suzanne J. Boyes *, Michael Elliott



Abbreviations:
BWD= Bathing Water Directive; BWM= Ballast Water Management Convention; CAP= Common Agricultural Policy; CFP= Common Fisheries Policy; EIA= Environmental Impact Assessment Directive; FRMD= Flood Risk Management Directive; FRMD (FRMP)= Flood Risk Management Directive (Flood Risk Management Plan); HD= Habitats Directive; MPS= Maritime Spatial Planning Directive; MSFD= Marine Strategy Framework Directive; Natura 2000= Habitats and Wild Birds directives; Nitrates Dir= Nitrates Directive; SAC= Special Area of Conservation; SEA Dir= Strategic Environmental Assessment Directive; SPA= Special Protection Area; UWWTD= Urban Wastewater Treatment Directive; WBD= Birds Directive; WFD= Water Framework Directive (with extension out to 12nm for chemical status); WFD (RBMP)= Water Framework Directive (River Basin Management Plan)

Geographical scope and competencies of EU marine legislation
(Boyes et al. 2016, Mar. Poll. Bull.)

Proactive/*A priori* assessment:

- EIA (process) linked to outcome (ES) (Directive, planning permission)
- Appropriate Assessment (linked to HSD)
- Habitat regulations Assessment (link to HSD)
- Status and pressures Monitoring (linked to WFD, MSFD)
- Cumulative Impact Assessment
- Strategic Environmental Assessment - linked to Marine Spatial Planning
- H1/EpiSuite - linked to complex effluents, IPPC authorisation (IPPC Directive)
- Data-base toxicology assessment (linked to licence creation, assess re. ability to accumulate, be persistence, magnify, be toxic) (but limitations cf. synergy/antagonism)

Types of Monitoring (in Directives):

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- Surveillance monitoring
- Condition monitoring
- Operational monitoring
- Compliance monitoring
- Check monitoring
- Self-monitoring
- Toxicity testing
- Investigative monitoring
- Diagnostic monitoring
- Feedback monitoring

Art. 14 of the MSFD & Art. 2 WFD - not meeting environmental targets or attaining GEnS or GEcS:

a) *action or inaction for which the Member State concerned is not responsible,*

b) *natural causes,*

c) *force majeure,*

d) *modifications or alterations to the physical characteristics of marine waters brought about by actions taken for reasons of overriding public interest which outweigh the negative impact on the environment, including any transboundary impact,*

e) *natural conditions which do not allow timely improvement in the status of the marine waters concerned*.

(See also the revision of the EU EIA Directive – Lonsdale et al, submitted;
Saul et al – Force majeure – Mar Poll Bull, accepted)

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journal homepage: www.elsevier.com/locate/marpolbul

Viewpoint

Force majeure: Will climate change affect our ability to attain Good Environmental Status for marine biodiversity?

Michael Elliott [a,*], Ángel Borja [b], Abigail McQuatters-Gollop [c], Krysia Mazik [a], Silvana Birchenough [d], Jesper H. Andersen [e], Suzanne Painting [d], Myron Peck [f]

Grand Challenges (to be addressed):

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- We have increasingly good data-layers which can be interrogated ***but*** there needs to be better quality assurance of the data
- There are many good initiatives worldwide ***but*** we are not good at learning from each other (or every state wants its own system)
- We have a plethora of governance (policies, politics, administration and legislation) ***but*** it is not yet joined-up
- There are tools for stakeholder involvement ***but*** the paradox of engagement has to be addressed
- Estuarine and coastal features are dominated by Unbounded Boundaries and Moving Baselines ***but*** management cannot yet cope with these
- We are good at single pressure effects ***but*** poor at determining cumulative effects and weighting footprints

Coastal Concordat – how English regulatory bodies will coordinate to consent development (1):

- For individual projects spanning the intertidal area in estuaries and coast and which require multiple consents (e.g marine licence & planning permission).
- Regulators to agree a **single lead authority to** coordinate the requirements of EIA or HRA.
- **Terrestrial EIA = LPA** (relying on MMO for advice on marine aspects; the EA to provide advice on flood and coastal erosion risk management, pollution control, fisheries, WFD aspects; Natural England for wildlife advice etc)
- **Marine EIA = MMO** (relying on the LPA for advice on any terrestrial aspects)

Coastal Concordat – how English regulatory bodies will coordinate to consent development (2):

- **HRA** (Habitats Regulations Assessment) = **The relevant Competent Authorities (CA) should reach agreement on who is the most appropriate lead authority for coordinating a HRA** based on:

- Important single technical issue: led by CA with the required technical expertise

- Large number of complex cross-cutting issues: led by CA with greatest capacity to undertake work

- Where plan or project cuts across administrative boundaries: led by CA with the principal interest

(Defra 2013)

Bringing it all together - What is an EPSS?

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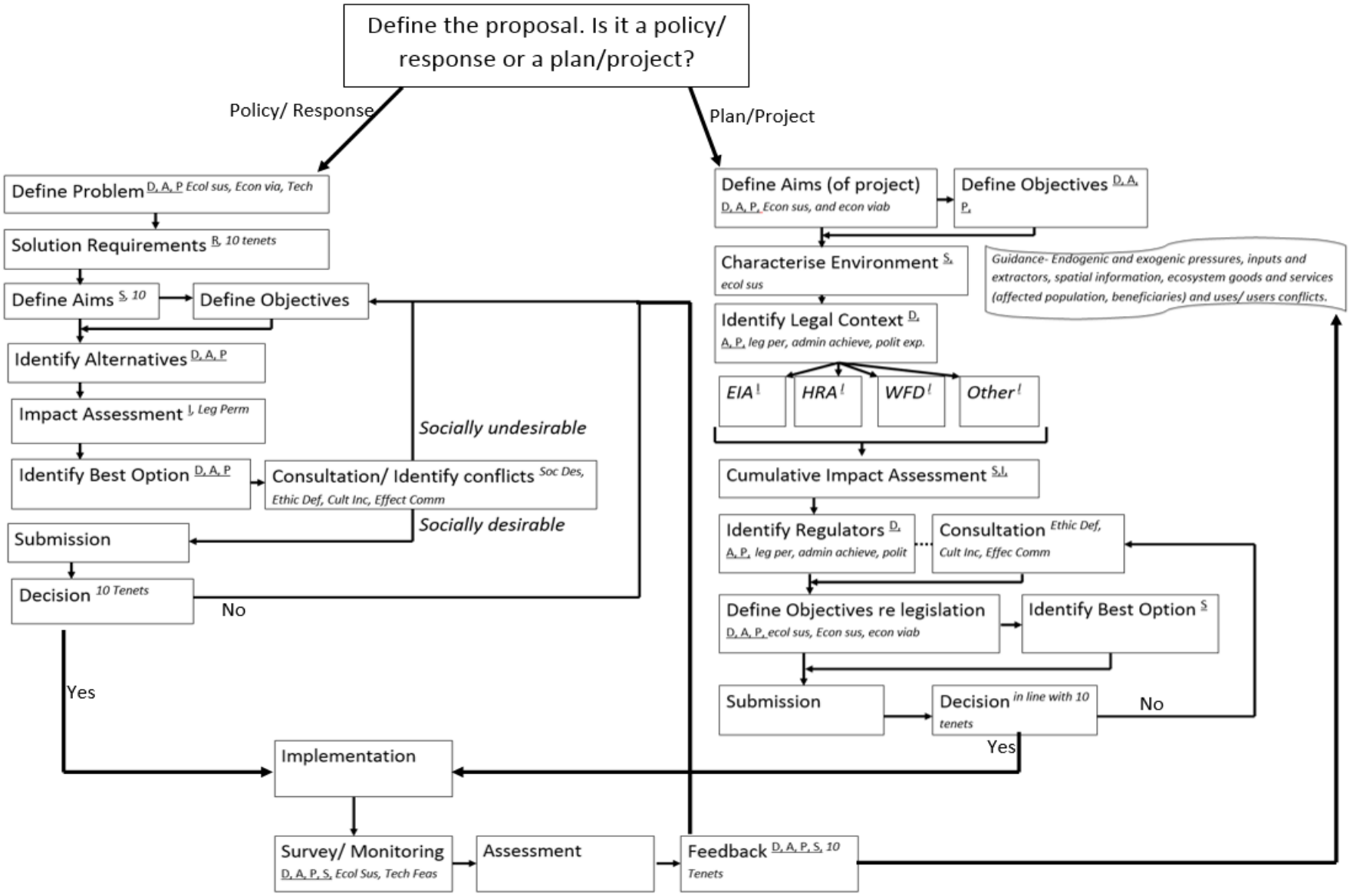
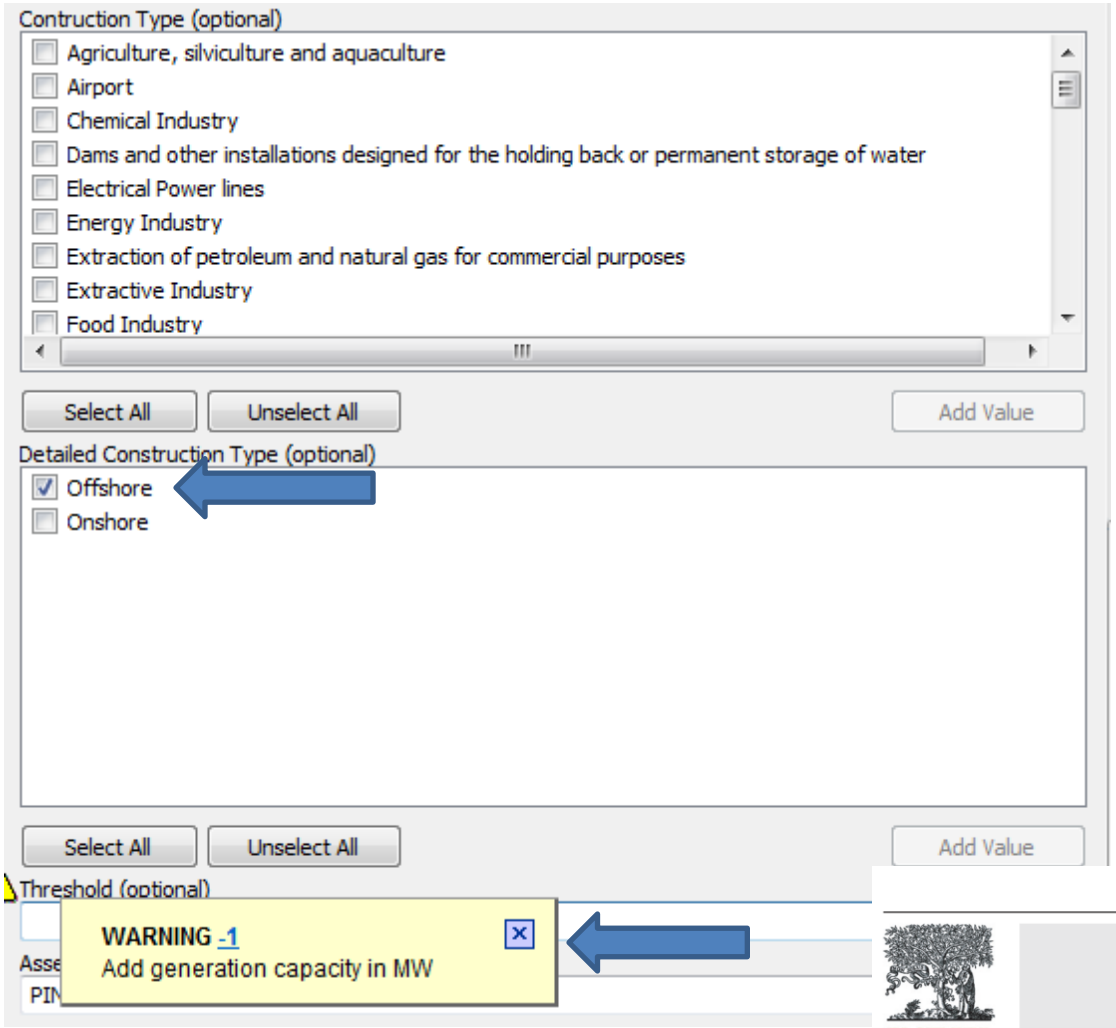
- An Estuarine Planning Support System is a framework that defines a clear planning or management process and the tools available to support the process
- To take into account the different disciplines to ensure the management of a system is holistic and ensuring that all the relevant stakeholders views are encompassed
- A system that is applicable to all environmental systems
- Developed from the basis in TIDE Tidal River Development

The EPSS Framework



The EPSS Tool – Legislative Requirements



Marine Pollution Bulletin 100 (2015) 393–405

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Marine Pollution Bulletin

journal homepage: www.elsevier.com/locate/marpolbul

Integrating management tools and concepts to develop an estuarine planning support system: A case study of the Humber Estuary, Eastern England

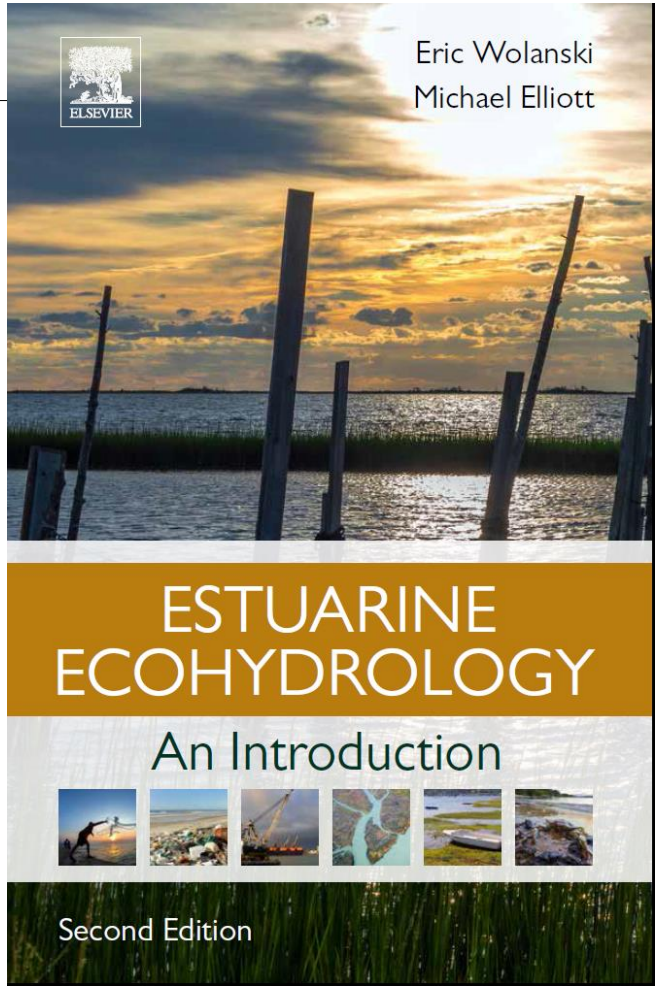
Jemma-Anne Lonsdale [a,b,*], Keith Weston [a], Steve Barnard [b], Suzanne J. Boyes [b], Michael Elliott [b]

Summary

- Governance is legislation and politics, policies and administration.
- Is the legislation the stick or the carrot?
- Does the legislation mean that nature is created which is good for the ecologist rather than the ecology?
- Does the legislation ensure eco-engineering or just engineering?
- Do the regulatory bodies have the capacity to move from tackling sectoral legislation?
- Can the sectoral regulatory bodies cope with overlapping spatial extent of legislative instruments?
- Can the legal instruments which aim to check deviation from a baseline (or reference condition) cope with moving baselines and unbounded boundaries?

But (and there is always a '*but*'):

- *The legislation may require something to be done but it does not always require a follow-up!*
- *If you don't understand the science of what you are doing the legislation won't help you!*



Estuarine, Coastal and Shelf Science 176 (2016) 12–35

Contents lists available at ScienceDirect

Estuarine, Coastal and Shelf Science

journal homepage: www.elsevier.com/locate/ecss

Ecoengineering with Ecohydrology: Successes and failures in estuarine restoration

Michael Elliott [a, b, c, *], Lucas Mander [a], Krysia Mazik [a], Charles Simenstad [d], Fiona Valesini [b], Alan Whitfield [c], Eric Wolanski [e, f]

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