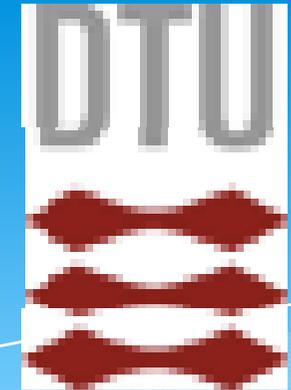




(a) an overall comment of the *draft* Research Plan; and
(b) a comment on the indicative research priorities/enabling actions relevant to their sector;

Prof. Mike St. John

General Perception



An overall comment of the *draft* Research Plan

- * In general a balanced approach taking into account the concerns of basic science and societal needs.
- * Science targeted is broad and buzz word in nature.
- * Lack of input from “experts” in the field.
- * Lacks the recognition that **we** are changing the functioning of the system (i.e. the system itself is in flux) and this has an impact on it’s resilience and ability to provide services.
- * It is a coupled system from climate to social systems and changes anywhere in the system have implications for the dynamics of the system and its emergent features i.e. Changes in biodiversity; exploited resources, carbon sequestration; economies and social systems.

Issue:

- * Understanding and managing the Atlantic and its resources requires the participation of the Bordering Nations. Is it wise to draw up a science plan without discussion with other Nations?
- * Should the US and Canada, for example been included in the development of this draft?

5.2. Basic Research & New Knowledge

5.2.1. Ecosystem functioning and processes: To better understand and manage the living marine resources of the Atlantic Sea Basin, it is vital to understand how these ecosystems function and what the factors and processes controlling them are. For example, more knowledge is needed about how the ocean climate influences the production of phyto- and zooplankton, the impact it has on the variation between predator and prey within the annual cycle and its role as a controlling factor in the migration, growth and recruitment of fish stocks.

This represents the description for marine ecosystems, a rich research area and the basis for the exploitable resources of the Atlantic e.g. fisheries, tourism and biodiversity as well as the sequestering of green house gases.

A more extensive description seems appropriate??

Ecosystem Functioning and Processes

Indicative Research Issues:

- Inherent complexity in marine ecosystems, requiring new modelling approaches;
- Air-sea and benthic-pelagic interactions;
- Energy flows and food webs, including harmful algal blooms (HABs);
- Non-linear tipping points and deoxygenated zones.

Indicative Enabling Actions:

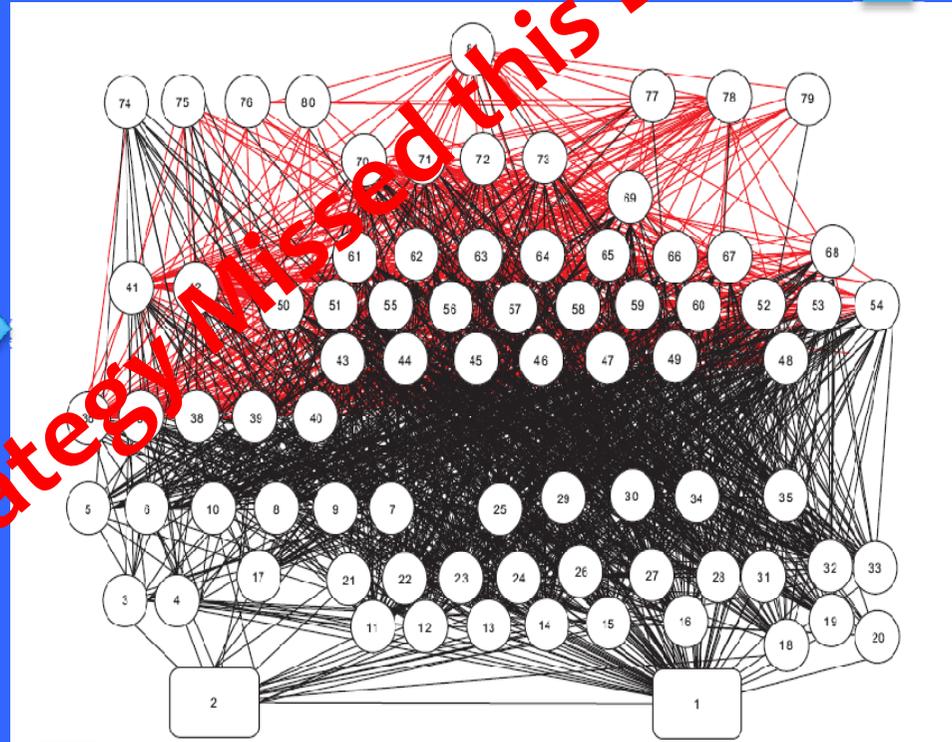
- Review of ecosystem functioning and process research which is currently being funded

These are Complex Adaptive Systems, their emergent features are the result of interactions within the system.



Fisheries & Biodiversity

Physics & Chemistry

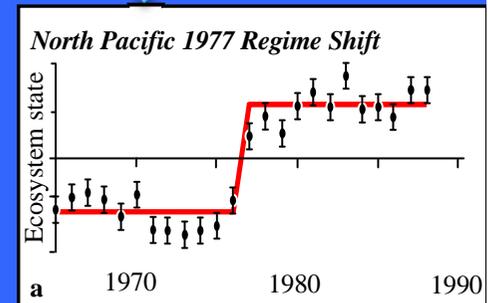


Regime Shifts

Carbon Flux



Link 2002



Ecosystem Functioning and Processes: Indicative Research Issues:

- * **Inherent complexity in marine ecosystems requires new modeling approaches**
 - * *Development and application of innovative modeling approaches to address the nonlinearity of interactions and feed backs within food webs.*
- * **Air-sea and benthic pelagic interactions???**
 - * *The role of marine ecosystems in aerosol production and climate modification?*
 - * Pelagic benthic is covered below
- * **Energy flows and food webs including harmful algal blooms**
 - * *The role of natural and anthropogenic processes in the modification of organism vital rates, energy flows in food webs and their impacts on biodiversity, green house gas sequestration and renewable resource production.*
- * **Non-linear tipping points and deoxygenated zones.**
 - * *System Dynamics: further our predictive understanding of the emergent features of marine ecosystems e.g. regime shifts/tipping points; green house gas sequestration; biodiversity change; exploitable renewable resources (e.g. fisheries)*

NEW:

- * **Basin shelf exchange of materials and organisms: Implications for ecosystem dynamics and carbon sequestration.**
- * **The role of pollutants on ecosystem function and structure, energy flow**
- * **Acidification effects on ecosystem structure and functioning**

Ecosystem Functioning and Processes: Indicative Enabling Actions.

- * **Review of ecosystem functioning and process research which is currently being funded.**
Realistic??
- * **Options**
 - * convene a workshop including research program coordinators to identify advances and research gaps.
 - * each participating nation funds a synthesis of national and international activities in the area.
 - * European Marine Science Week highlighting the activities and findings of the completed and ongoing projects

Other Issues

Monitoring and observation ????? Platforms, new observational tools

Genomics