

Ocean Fertilization, Marine Geoengineering and the London Convention/London Protocol

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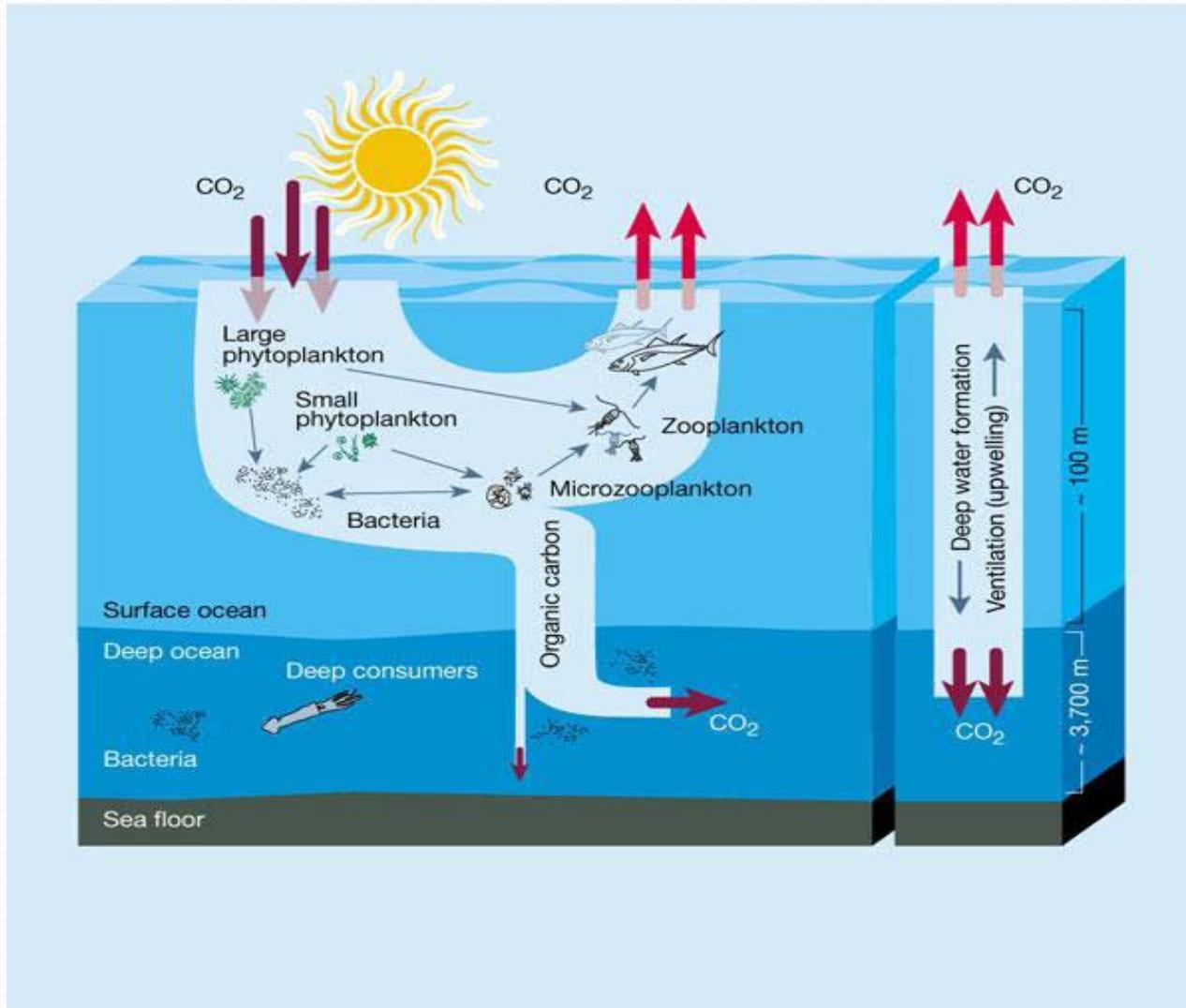
Law of the Sea Convention Brownbag Series

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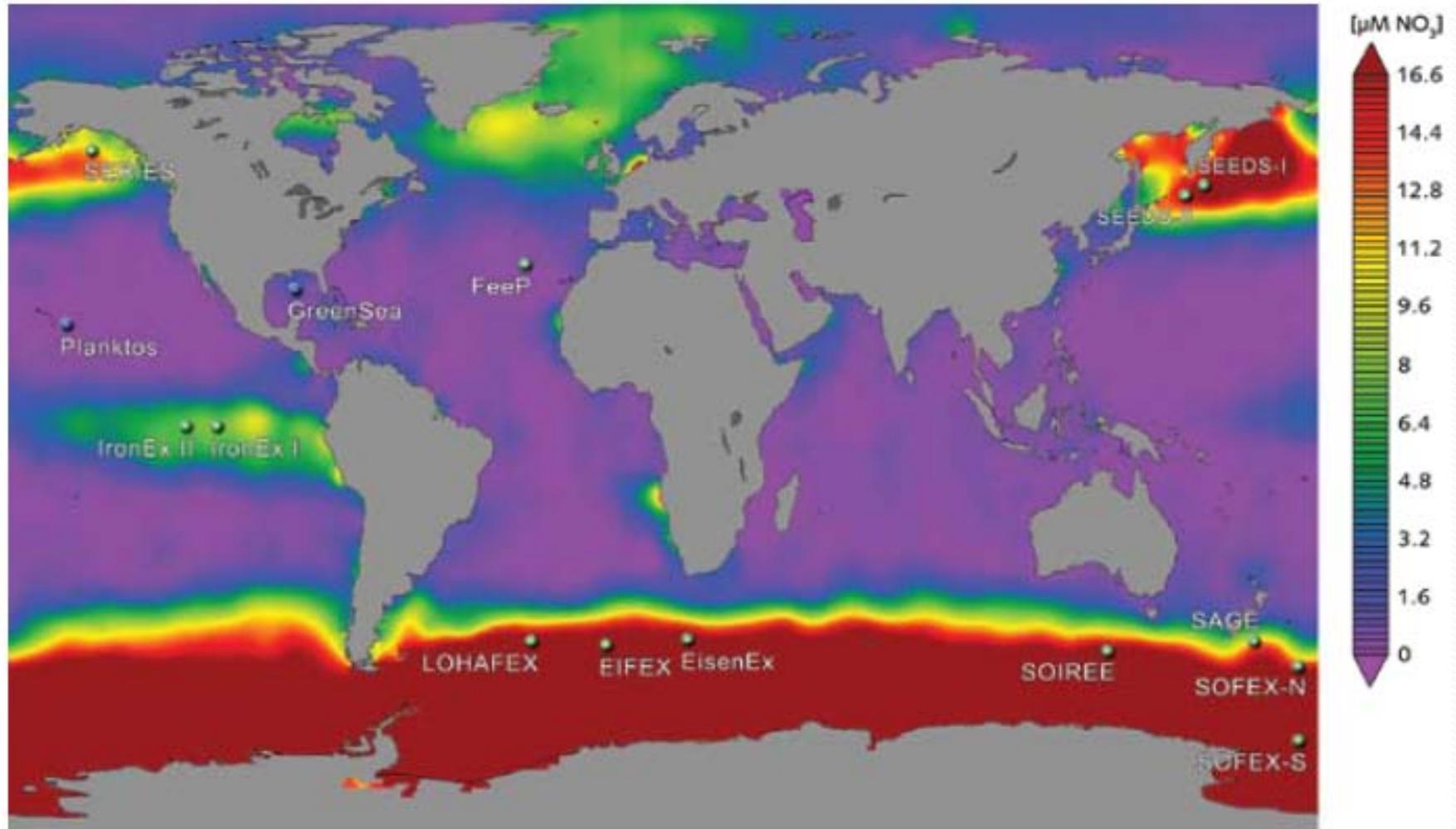
What is Ocean Fertilization?

“for the purposes of this resolution, ocean fertilization is any activity undertaken by humans with the principal intention of stimulating primary productivity in the oceans.” – Resolution LC-LP.1 (2008) On the Regulation of Ocean Fertilization

The Ocean's Biological and Solubility Pumps



High Nutrient, Low Chlorophyll (HCNL) Regions



Isn't this old news? Why do we care?

- In the past few years active interest in conducting ocean fertilization experiments seemingly tapered off, until...
- October 2012: The Guardian reports a July 2012 iron fertilization experiment off west coast of Canada
 - Haida Salmon Restoration Corporation (HSRC) reportedly introduced 100 metric tons of iron sulfate into surface waters off west coast of Canada, near Haida Gwaii Islands
 - HSRC identified NOAA as a partner on its website

Continued, NOAA Statement

“NOAA’s global ocean drifters provide data about the world ocean (such as ocean currents and temperature) that aids forecasters and researchers. Due to limited government resources, NOAA relies on volunteers and vessels of opportunity to deploy global ocean drifters into strategic locations.

In July, the Haida Salmon Restoration Corporation offered to deploy 20 NOAA global ocean drifters off the West Coast of Canada for a salmon research project. Haida Salmon Restoration Corporation did not disclose that it was going to discharge material into the ocean, nor did our drifters contribute to the discharge of any material.”

Ocean Fertilization Makes Its LC/LP Debut

- The London Convention and London Protocol (LC/LP) issued a statement of concern in 2007:

“knowledge about the effectiveness and potential environmental impacts of ocean iron fertilization currently **was insufficient to justify large-scale operation....** noted with concern the potential for large-scale ocean iron fertilization to have negative impacts on the marine environment and human health.”

U.S. Position on Ocean Fertilization, 2010

The United States believes that ocean fertilization **should not be employed as a climate change mitigation measure** at this time given the current limited understanding of the underlying science and potential for adverse side effects.

The United States **strongly supports basic scientific research into the global climate system**, including research into the marine carbon cycle and its role in the global carbon cycle.

The United States **encourages scientific inquiry and research activities designed to advance understanding of the dynamic relationships between marine biogeochemical and ecological processes and consequences related to nutrient inputs to the sea.....**

At this time, there is no scientific basis for issuing carbon credits, deferments, or offsets for ocean fertilization activities.

LC/LP Ocean Fertilization Timeline

- 2007 Statement of Concern
- 2008 Resolution:
 - “...given the present state of knowledge, ocean fertilization activities other than legitimate scientific research should not be allowed; ...scientific research proposals should be assessed on a case-by-case basis using an assessment framework to be developed by the Scientific Groups.”
- 2008-2010: development of Ocean Fertilization Assessment Framework

LC/LP Timeline, Continued

- 2010 Resolution:
 - formally adopted the Ocean Fertilization Assessment Framework
 - affirmed that Parties should “continue to work towards providing a global, transparent, and effective control and regulatory mechanism for ocean fertilization activities, and **other activities** that fall within the scope of the London Convention and the London Protocol and have the potential to cause harm to the marine environment.”

LC/LP Timeline, Continued

- 2010-2012: discussions on possible options, including amending the LP to cover “other activities”
 - Conversation now includes marine geoengineering
 - US position: current Resolutions and Assessment Framework, in conjunction with the LC/LP instruments themselves, provide the requisite regulatory mechanism
 - Regardless of the options, we should limit to ocean fertilization for now

LC/LP Timeline, Continued

- 2012 Statement of Concern Regarding Haida Salmon Restoration Corporation's experiment:

“The Parties to the LC/LP express grave concern regarding the deliberate ocean fertilization activity that was recently reported to have been carried out in July of 2012 in waters off the Canadian west coast.....The Parties recognize the actions of the Government of Canada in investigating this incident.”

Relevant International Frameworks

- UNFCCC
 - Objective: Stabilization of GHG (Art. 2)
 - Protect the Climate System (Art. 3.1)
 - Take Precautionary Measures (Art. 3.3)
 - Promote Technologies (Art. 4)
 - Sinks and Reservoirs
 - Impact Assessments

Kyoto Protocol

- Carbon Credit Trading Mechanism
 - Removal by Sinks (Art. 3.3)
 - Afforestation
/Reforestation/Deforestation
 - Clean Development Mechanism
 - Voluntary Trading Market

Convention on Biological Diversity (CBD)

- Conservation, Sustainable Use, Sharing
- Cooperate Outside National Jurisdiction
- Identify Processes and Activities
- Regulate and Manage Them
- Tension Between CBD and UNFCCC
 - Carbon Effect on Food Chain Corals

CBD and Ocean Fertilization

- OF Adverse Effects
- Decision XI/16 – May 2008
- Precautionary Principle – Exception
- Only Scientific Research
- Need for International Assessment Frame
- Decision X/33 – October 2010
- London Convention/London Protocol

UN Convention on Law of the Sea

- Protect and Preserve (192)
- Prevent, Reduce and Control Pollution (194)
- Cooperate on a Global & Regional Basis (197)
- Prohibit Transfer of Hazards (195)
- Pollution Defined – Deleterious Effects
- The Precautionary Principle

UNCLOS and Dumping

- Prevent, Reduce, Control – Includes Dumping
- Deliberate Disposal of Wastes or Other Matter from Vessels, etc. . . . at Sea
- Exception for Placement of Matter (Art. 1)
- Process – Prevent and Manage (210)
- International Dumping Standards

Back to the LC/LP

- Based Essentially on UNCLOS 194 & 197
 - Prevent, Control, Reduce, Cooperate
- Exemption for Placement
- LC – No Dumping of Listed Matter
 - Iron, Phosphate, Nitrate not Listed
- LP – No Dumping Except Those Listed
 - Iron, Phosphate Nitrate not Listed

LC/LP Continued

- Is OF Dumping or Placement?
- LP Article 3 – Precautionary Approach
 - Even if No Conclusive Evidence of Causal Relation
 - Lack of Knowledge no Reason for Postponing
- Importance of Establishing International Norms

LC/LP Continued

- “Statement of Concern” – 2007
- 2008 – Large-Scale OF Not Justified
 - Brings Scientific Research Under Exemption
 - Development of an Assessment Framework
- 2010 – Adopted Assessment Framework
 - Global, Transparent, Effective Control
 - Activities Not Research Are Dumping

LC/LP Continued

- Australia-Korea-Nigeria Proposal (April 2013)
 - OF and Other Activities
 - Legally Binding Mechanism to Regulate OF
 - Allow Other Marine Geoengineering Activities That Have Potential to Cause Harm
 - Definition – Deliberate Intervention in Marine Environment to Manipulate Natural Processes
 - Potential for Widespread, Severe Effects

LC/LP Continued

- New Article -- Placement Activities
- New Annex 4 Listing Activities – OF Listed
- Placement, for Purposes Other Than Disposal & Not Contrary to the Aims of LP
- New Annex 5 – Generic Assessment Framework

LC/LP Continued

- What Activities?
- Must be:
 - (a) Intentional
 - (b) Designed to Control Natural Processes for a Desired Outcome
 - (c) Potential Environmental Effects More than Transitory, Localized, or Minimal

Ethical Considerations

- Is It Going to Be Worth the Effort?
- Adverse Effects – Local and Far-Afield
 - Harmful Algal Blooms
 - Changes to Structure of Food Webs
 - Changes in Oxygen Distributions
 - Changes in Cycling of Other GHGs
 - Transport
- Human Inadequacies in Duplicating Nature

Ethical Considerations, Continued

- “. . . *the Greatest Challenges. . .*”
- OF and Beyond – CDR and SRM
- “Moral Hazard” Problem
 - Amplify Ocean Acidification
 - The “Termination Problem”
- Interest Groups
- The “Omitted Voice”

Ethical Considerations, Continued

- Governments Must Clarify Responsibilities
- Research Must Be Open and Cooperative
- Public Participation Must be Provided
- Distribution of Resources and Impacts
- Techniques That May Alter Ecosystems
- Broader Context: *Climate Change Management*

Ethical Considerations, Continued

- Not a Source of Carbon Credits
- Coordinated, Fully Transparent International Research
- Fortunately, OF Potentially Has a Home
- But No Effort to Develop a Governance Structure for Geoengineering Generally
- Continue to Adopt *Ad Hoc* Bans?