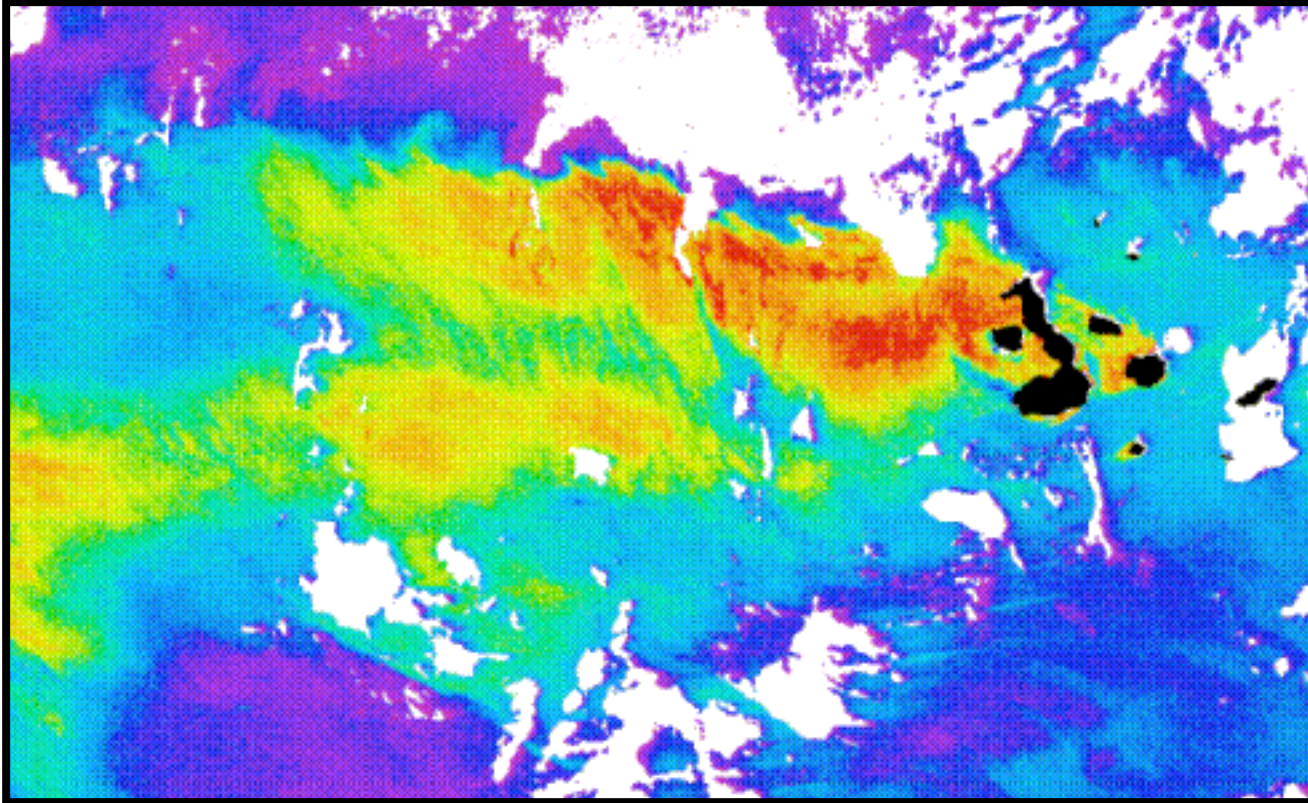
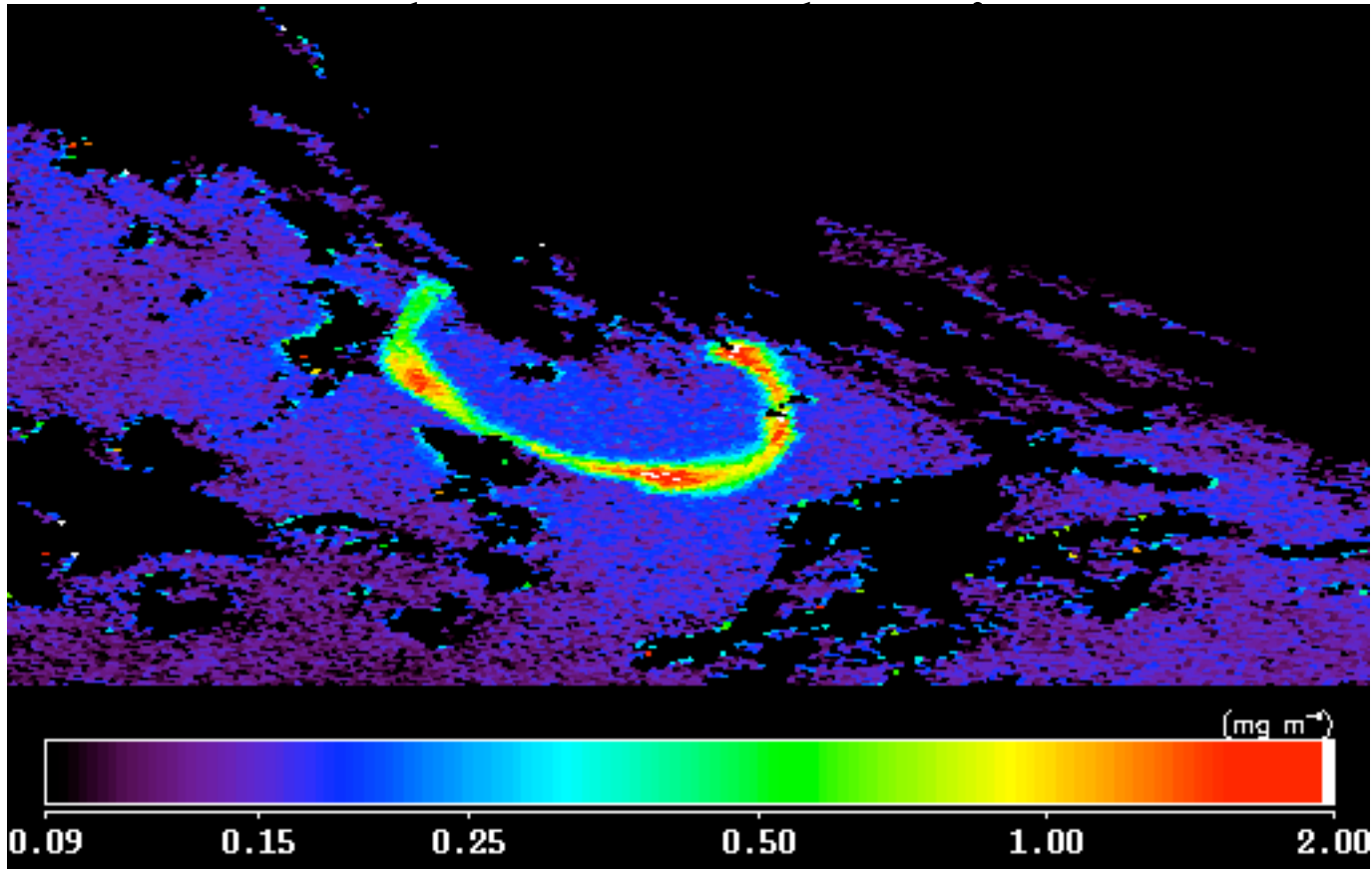


# Iron from Galapagos stimulates carbon fixation by marine



Chlorophyll content estimated from SeaWiFS

Intentionally added iron can stimulate increased organic



SEAWIFS image of the SOIREE phytoplankton bloom.

## Ocean carbon storage after 100 yr of fertilization (GtC)

Joos, Sarmiento, and Siegenthaler. (1991)	255 GtC
Peng and Broecker (1991)	247 GtC
Sarmiento and Orr (1991)	153 GtC
Kurz and Maier-Reimer (1991)	106 GtC
Caldeira and Milovich (2003)	176 GtC

# Fertilization proposed by commercial interests

**Table A. Fertilization Methods Proposed by Commercial Interests**

<b>Organization</b>	<b>GreenSea Venture, Inc.</b> (formerly Ocean Farming) www.greenseaventure.com	<b>Ocean Technology Group</b> (U. of Sydney, Australia) www.otg.usyd.edu.au	<b>Ocean Carbon Sciences, Inc.</b> (Formerly Carboncorp USA) www.rsrch.com
<b>Principal</b>	Michael Markels, Jr.	Ian S.F. Jones	Russ George/ Robert Falls
<b>Fertilizer</b>	Fe-chelate (lignic acid sulfonate)	NH <sub>3</sub> solution in seawater	Proprietary nutrient supplements, Fe + ?
<b>Ocean Area(s) Targeted for Fertilization</b>	Equatorial Pacific Ocean (for demonstration experiment)	- Chilean coastal upwelling zone  - Coastal waters of "Low income food deficient" nations	- "Plankton domains" along major shipping lanes
<b>Claimed Efficacy</b>	0.6-2 Mt CO <sub>2</sub> sequestered over 5,000 sq. mi. of HNLC ocean in 20 days	1 Gt N/yr sequesters about 5 Gt C/yr	Not specified
<b>Claimed Cost</b>	\$7 to \$7.5 /tC (at "commercial scale")	Approx. \$30 /t C	Not available

from Adhiya and Chisholm (2001)

# Promise

Huge C:Fe ratio in plankton; it's a large lever

Painlessly extracts carbon from the atmosphere

# Caveats

Efficient large-scale fertilization has yet to be demonstrated

Extremely difficult or impossible to validate the amount of sequestered carbon

Most of the carbon probably only sinks a few hundred meters: only a short-term sequestration

If the nutrients would have been used by plankton ultimately anyway, then the net gain is nada.