A Framework for Evaluating Carbon Sequestration
The earth tech approach starting with cetaceans

Restoring Estuarine & Coastal Habitats in the NE Atlantic
London, UK

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Outline

- Climate Change and the IMF
- The Whale and Us
- A Financial Framework for Valuing Cetaceans (& wildlife more generally?)
- How Does it Work?
- From Measurement to Mitigation
- A Call to Action
- Other Applications for the Framework
Climate Change and the IMF

“Climate Change is the great existential challenge of our times. It is a challenge that spans all regions, with especially severe consequences for low-income countries.

Without mitigating actions, global temperatures are projected to rise by 4°C above pre-industrial levels by the end of the century—with increasing and irreversible risks of collapsing ice sheets, inundation of low-lying island states, extreme weather events, and runaway warming scenarios.

A warming climate could also mean increased extinction risk for a large fraction of species, the spread of diseases, an undermining of food security, and reduced renewable surface water and groundwater resources.”

The risk of future damages needs to be factored into projections of national output and debt sustainability levels.
There’s a need for effective carbon pricing, which

- **Is the single most effective mitigation instrument.**
  - It provides across-the-board incentives to reduce energy consumption, use cleaner fuels, and mobilize private finance.

- **Provides much needed revenues.**
  - These should be allocated to reorient public finances in support of sustainable and inclusive growth.

- **Could be used to meet Paris CO₂ mitigation pledges.**
  - A carbon price $70 per ton would cut CO₂ emissions by a third by 2030.
Beyond CO$_2$ Taxation

- **Other mitigation instruments can have an important role.**

- **There’s a need for a holistic strategy**, going well beyond physical climate-proofing investment is needed in vulnerable countries.

- **National strategies could encompass a variety of ways to diversify natural disaster and climate risks**, such as building up contingency funds or participating in regional insurance schemes.

- Are there other earth-friendly approaches to reducing climate risk?
A New Paradigm

Working with scientists, academics, and Great Whale Conservancy Group (GWC), to develop

- A financial framework for valuing cetaceans and nature in monetary terms, that
- Highlights the values of what has been lost, thereby
- Creates a target for restoration, and
- Analyzes cost-benefit of proposed mitigation measures, thereby
- Informs better public policy debate on needed actions to save the environment
Science tells us

Oceans are the lungs of the Earth, United Nations

- Phytoplankton captures 40% of all CO$_2$ and produces 50% of all Oxygen.
- This is also equivalent to CO$_2$ captured annually by 1.7 trillion trees, 4 Amazon forests, or 70 Redwood State parks, USA.
Science also tells us

Whales sequester carbon **directly** on their bodies, and **indirectly** through their role in fertilizing phytoplankton.
From Science to Finance:
Whale is an Asset worth $2 million US dollars

Fishing industry estimated at over $150 billion. Whales contribute to the food web chain and increased fish stocks.

Phytoplankton productivity, which is enhanced by whales, captures 37 billion tons of CO₂ per year.

How much is one whale worth?

Whale watching industry estimated at over $2 billion globally.

Each whale sequesters 33 tons of CO₂ on average, when it dies and sinks to the ocean floor.
Valuation Framework

- Estimate the pre-whaling population’s annual contribution to carbon sequestration
- Use the price of carbon ton
- Estimate the entity’s other economic benefits
- Estimate a reasonable discount rate
- Apply (growing) perpetuity model to the annual sum of the entity’s contributions to find the value of population’s contributions
  - Divide by population size to determine value of individual
- Alternatively, use a (growing) perpetuity model to find the value of a sustainable increase in the population
The whale is an international public good

- Summer feeding grounds
- Winter breeding grounds
- Probable resident population

Summer and winter relates to seasons in the northern Hemisphere.

Sources: adapted from CONABIO, Informe final del Proyecto W324: La ballena jorobada (Megaptera novaeangliae) en la Norma Oficial Mexicana, 2002.

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Call to Action

- Declare the whale an *International Public Good*
  - Need global coordination
- Stop ship strikes, whaling, entanglements, sonar and seismic testing, and plastics
- Develop fisheries management that supports growth of whale populations
- Establish a Global Fund for covering the cost of mitigation

- *How much do we Value Our Next Breath?*
  - *It would cost less than $13 dollars per person per year to subsidize whales’ CO₂ sequestration, at pre-whaling numbers*
Wider application of the Framework

- Framework allows for valuing other parts of nature beyond cetaceans as environmental **assets!**

- Measures contributions across their natural and economic functions, thereby

- Allowing for more accurate cost-benefit analysis of measures to protect these assets, and for

- Gaining traction with stakeholders
Cetaceans to Saltmarsh?
Happy to work with the UK to broaden the framework

Courtesy of CoastWEB, Plymouth Marine Laboratory & art by Toni Llobet
“The time is always right to do what is right.”
Reverend M.L. King Jr.