



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.***

IMF: Call to Action

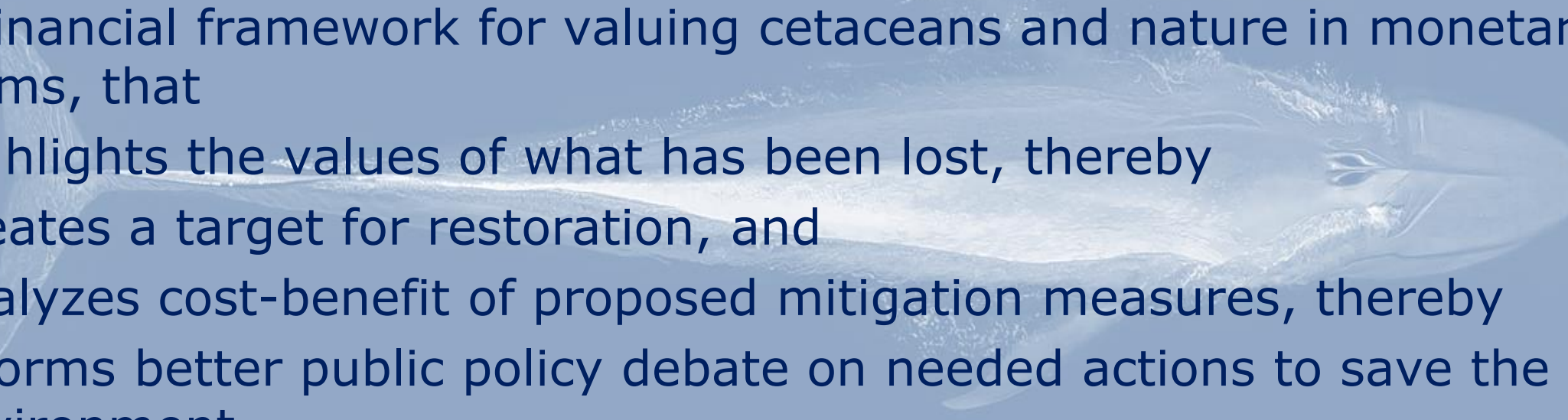
- ***There's a need for effective carbon pricing, which***
 - *Is the single most effective mitigation instrument.*
 - It provides across-the-board incentives to reduce energy consumption, use cleaner fuels, and mobilize private finance.
 - *Provides much needed revenues.*
 - These should be allocated 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 CO₂ Taxation

- *Other mitigation instruments can have an important role.*
 - Example, reforming energy subsidies: fossil fuel subsidies costing \$5.2 trillion in 2017.
- *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

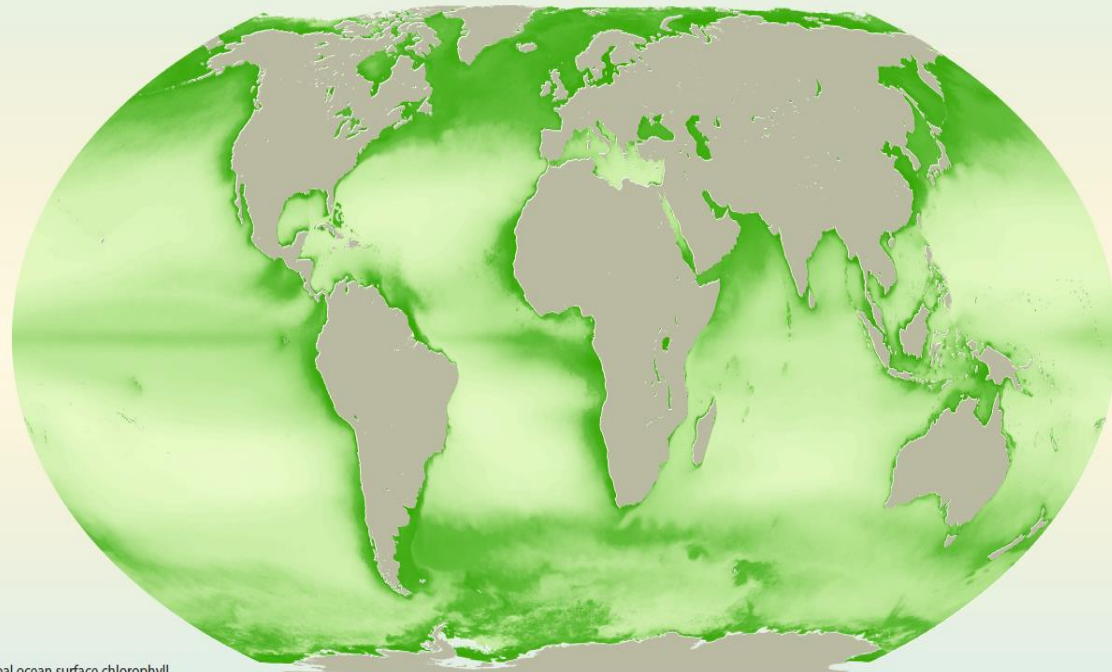
- ❑ A financial framework for valuing cetaceans and nature in monetary terms, that
 - ❑ Highlights the values of what has been lost, thereby
 - ❑ Creates a target for restoration, and
 - ❑ Analyzes cost-benefit of proposed mitigation measures, thereby
 - ❑ Informs better public policy debate on needed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

Science tells us

Oceans are the lungs of the Earth, United Nations

- Phytoplankton captures 40% of all CO₂ and produces 50% of all Oxygen.
- This is also equivalent to CO₂ captured annually by 1.7 trillion trees, 4 Amazon forests, or 70 Redwood State parks, USA.

Phytoplankton is responsible for every other breath



Map of global ocean surface chlorophyll concentration. Chlorophyll concentration (mg/m³) is an indication of the density of photosynthetic organisms, such as phytoplankton.

High

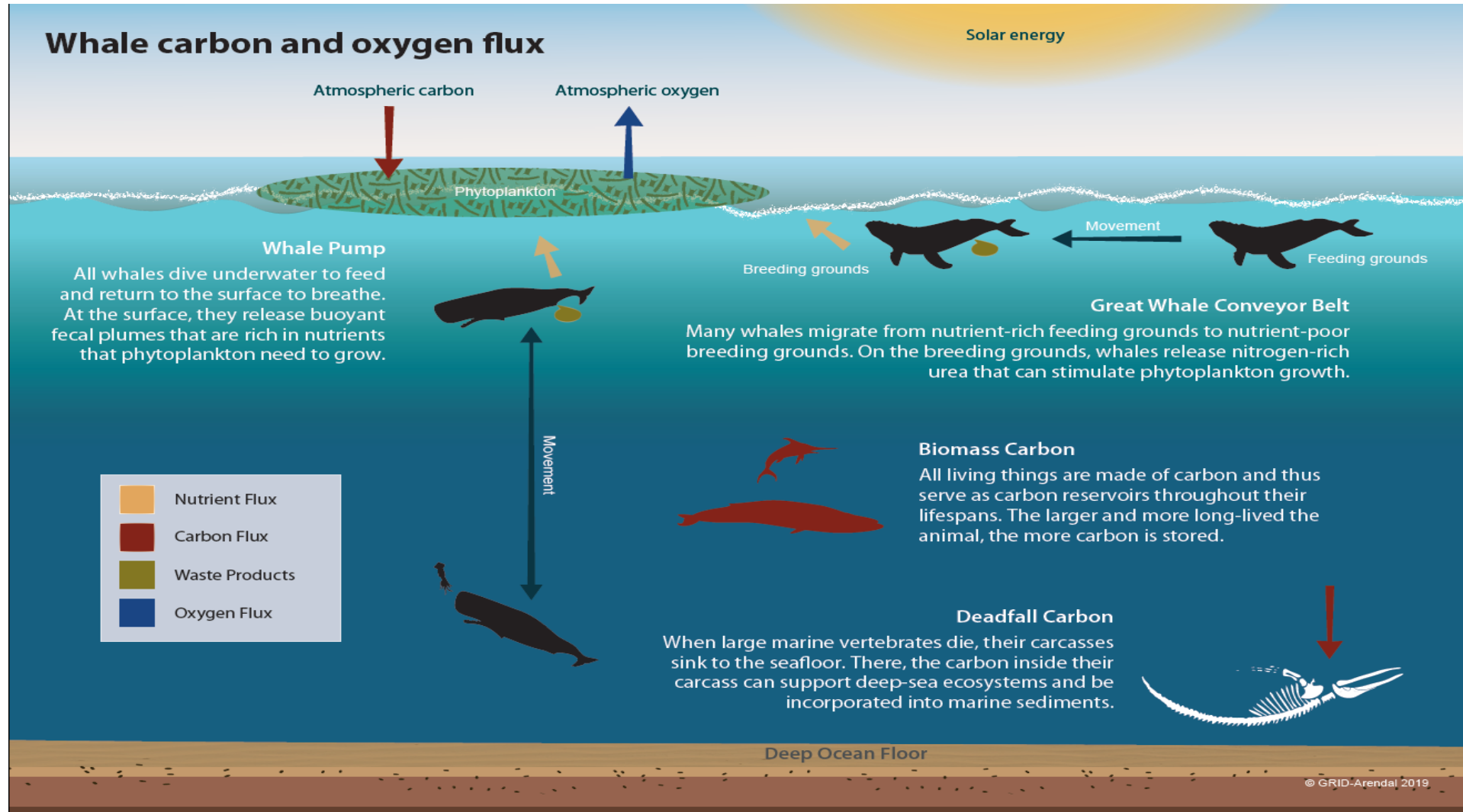
Low

Source: SeaWiFS Project, NASA, composite data set 1997-2010.

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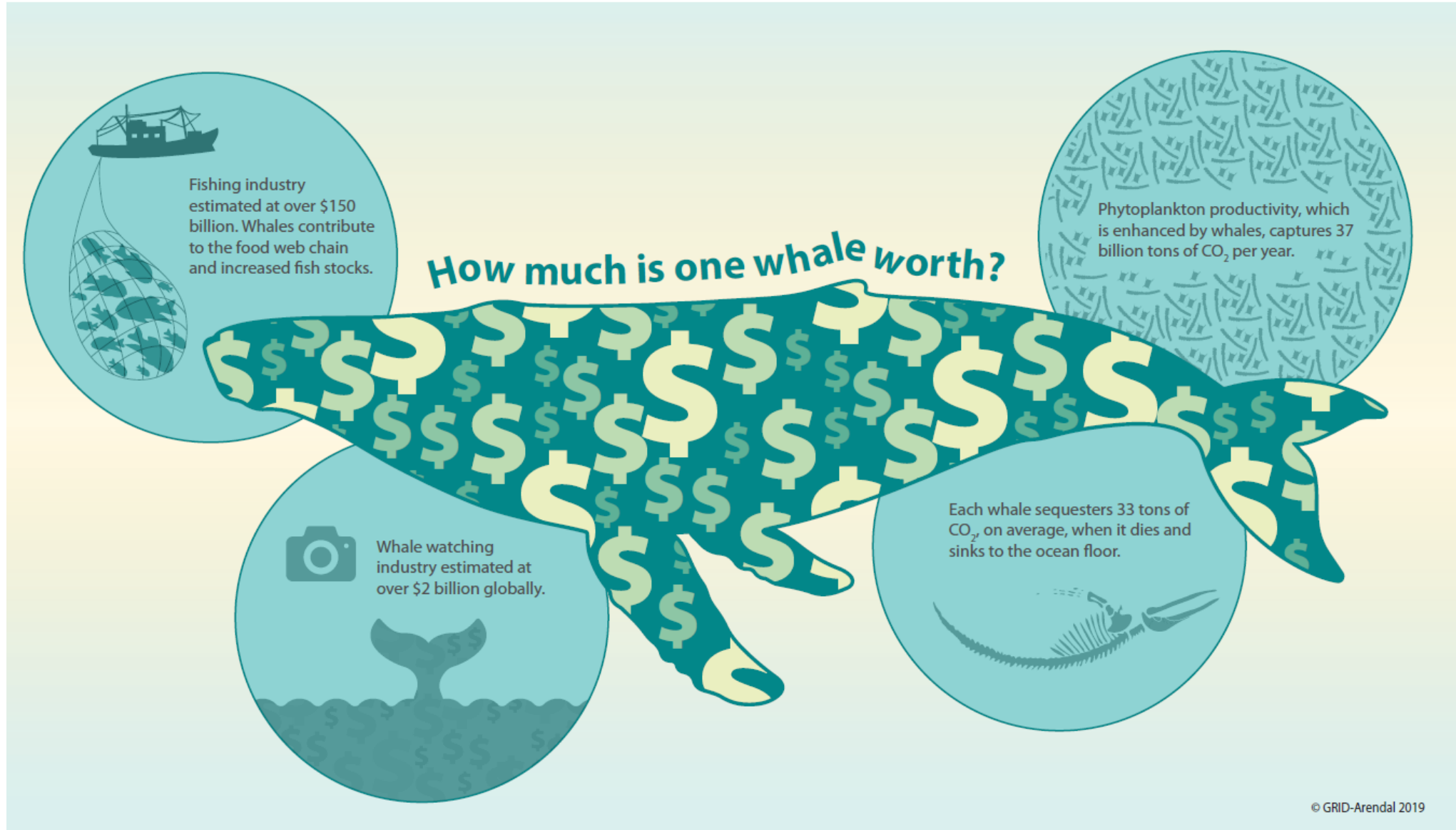
Science also tells us

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

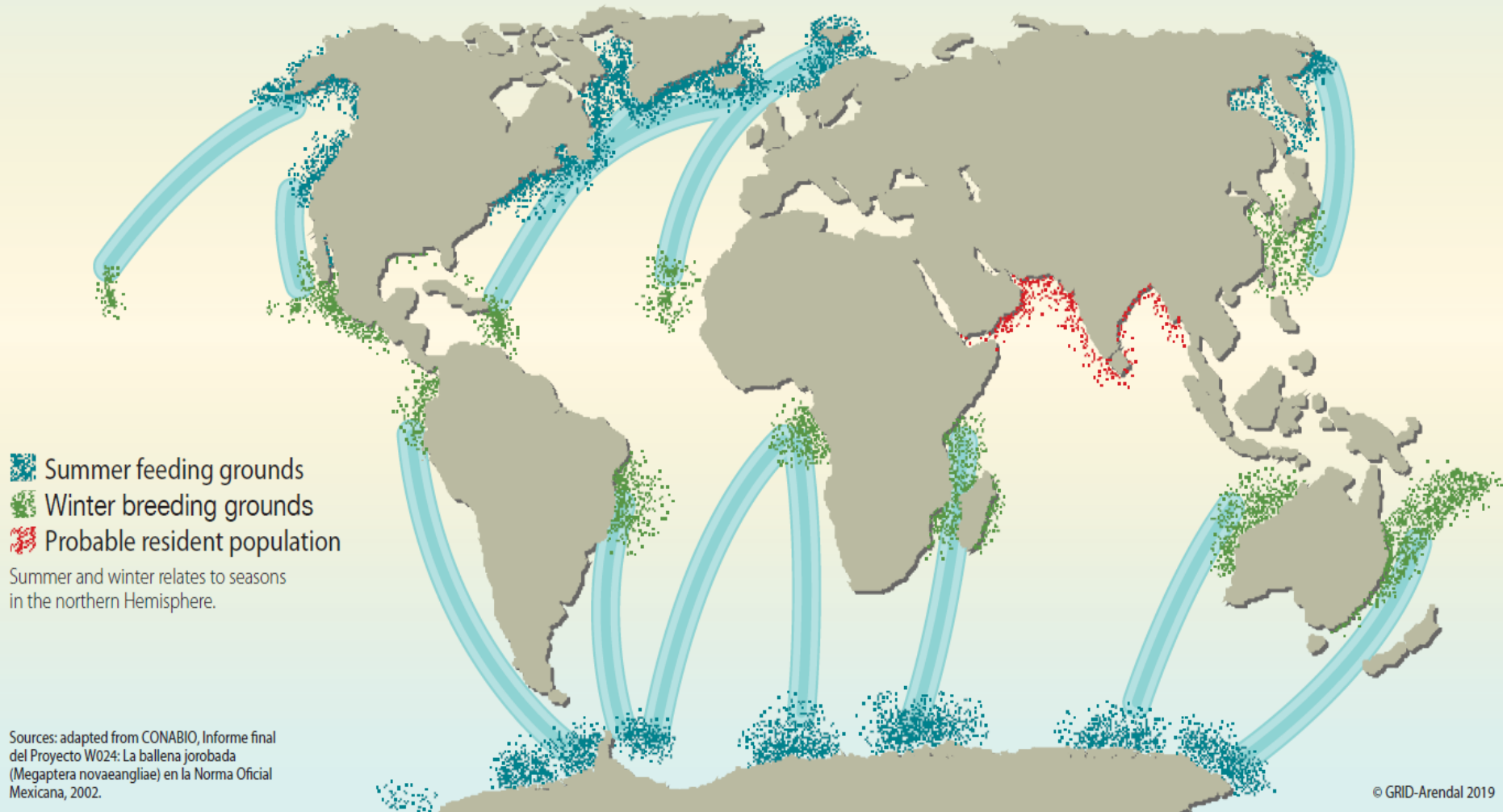


Valuation Framework

- 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

From Finance to Policy

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 W024: La ballena jorobada (*Megaptera novaeangliae*) en la Norma Oficial Mexicana, 2002.

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.

