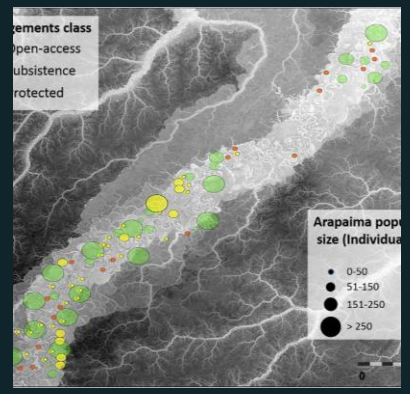
LESSON 11

FROM EVIDENCE TO A DEFENSIBLE DECISION







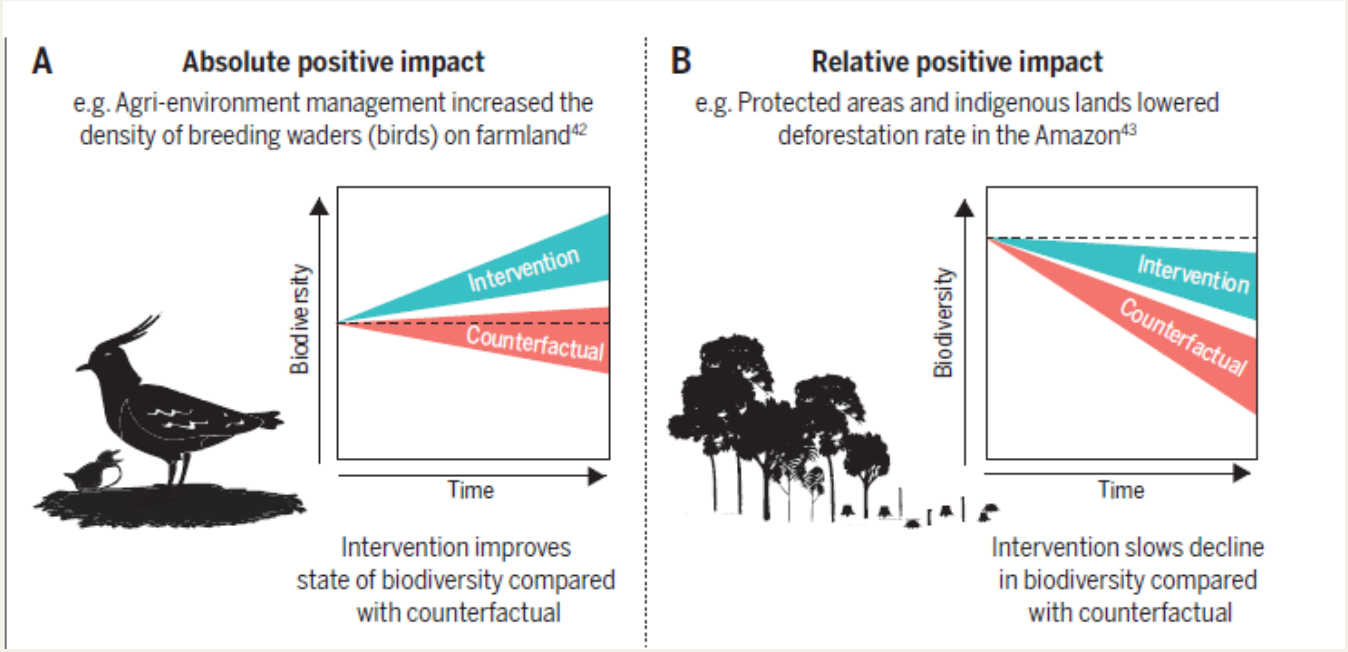
REAL ECOSYSTEMS · REAL EVIDENCE · REAL DECISIONS

IMPACT ≠ TREND

Impact asks one causal question:

What changed because we acted?

A decline can still be a success if the credible counterfactual is worse.



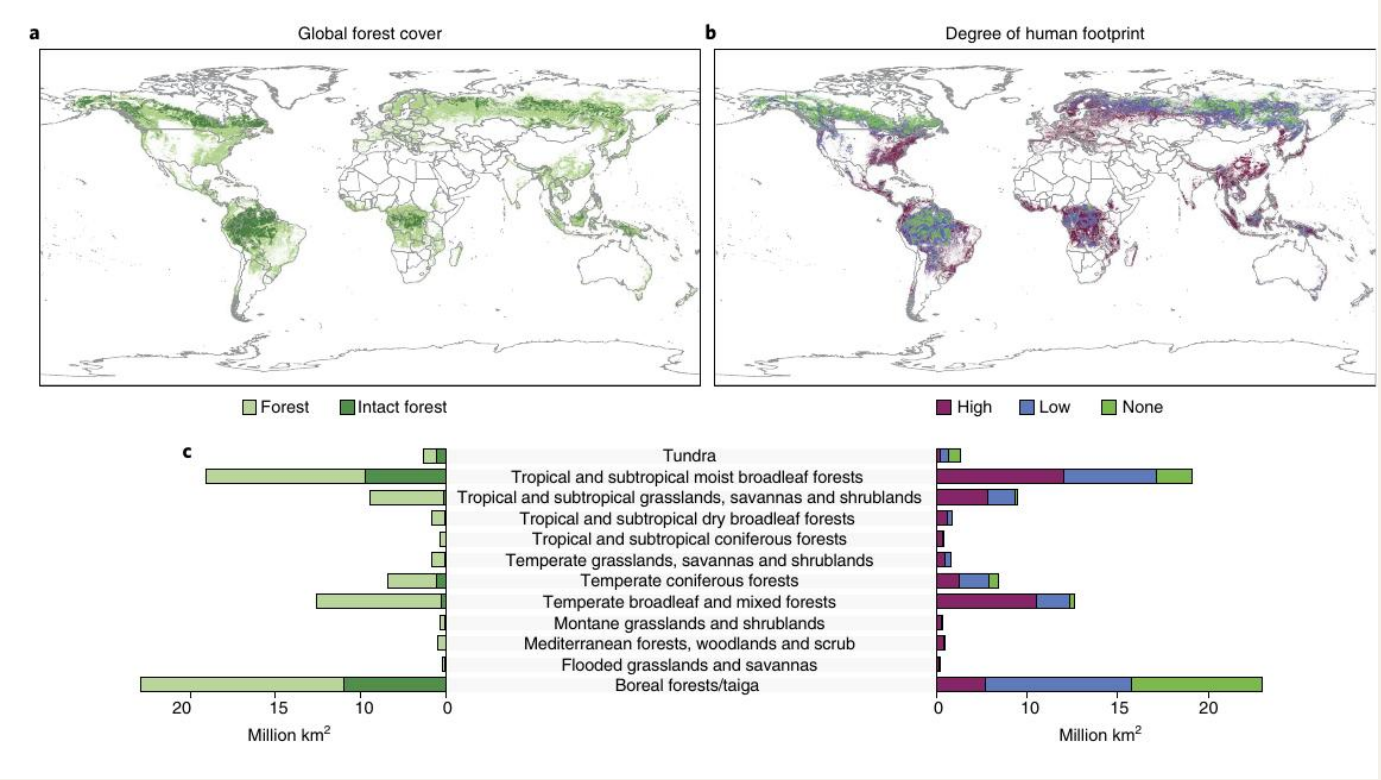
Now ask the harder question: what action actually fits this ecosystem?

The same intervention can be recovery in one ecosystem and degradation in another.

FORESTS

Protect integrity not only cover

Forest extent can stay stable while ecological function, fauna and carbon storage erode.



PRIORITY

Keep intact forests intact.

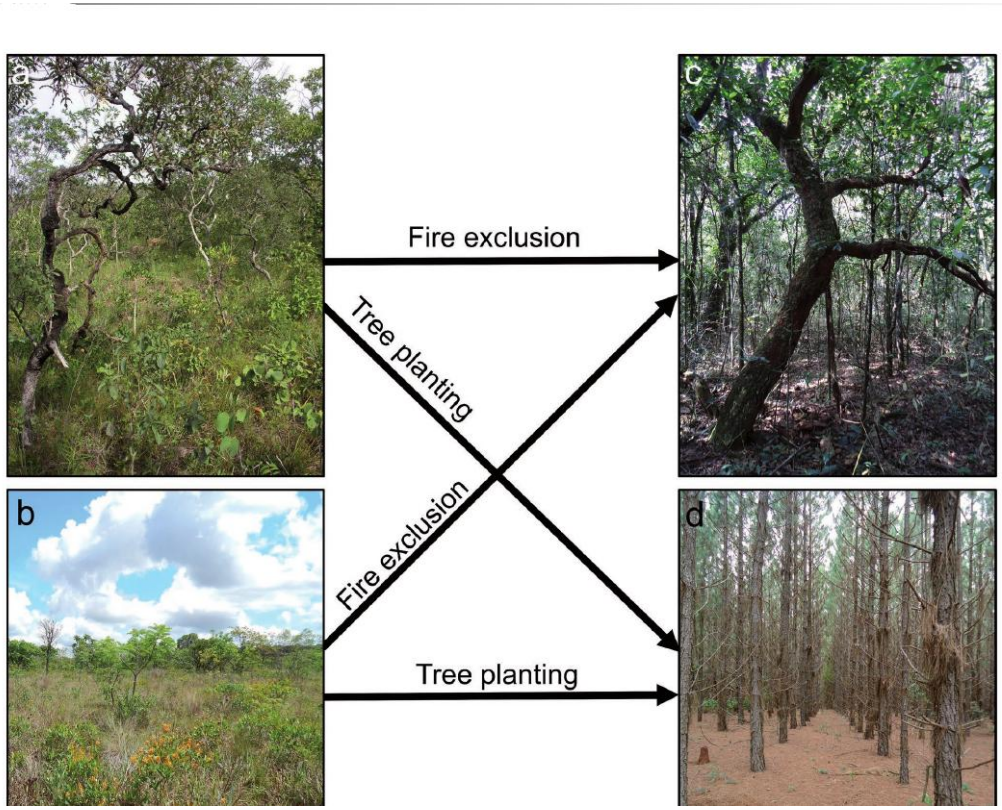
Reduce degradation · retain large contiguous areas · protect fauna and disturbance regimes · restore connectivity where integrity is already lost.

Forest cover is an incomplete conservation target.

Watson et al. 2018 · Nature Ecology & Evolution · Fig. 1.

GRASSLANDS + SAVANNAS

SAVANNAS and GRASSLANDS Do not restore a forest where the ecosystem is meant to be open



9 million km²

ancient grassy biomes identified as forest-restoration "opportunities" in the analysed global atlas

PRIORITY

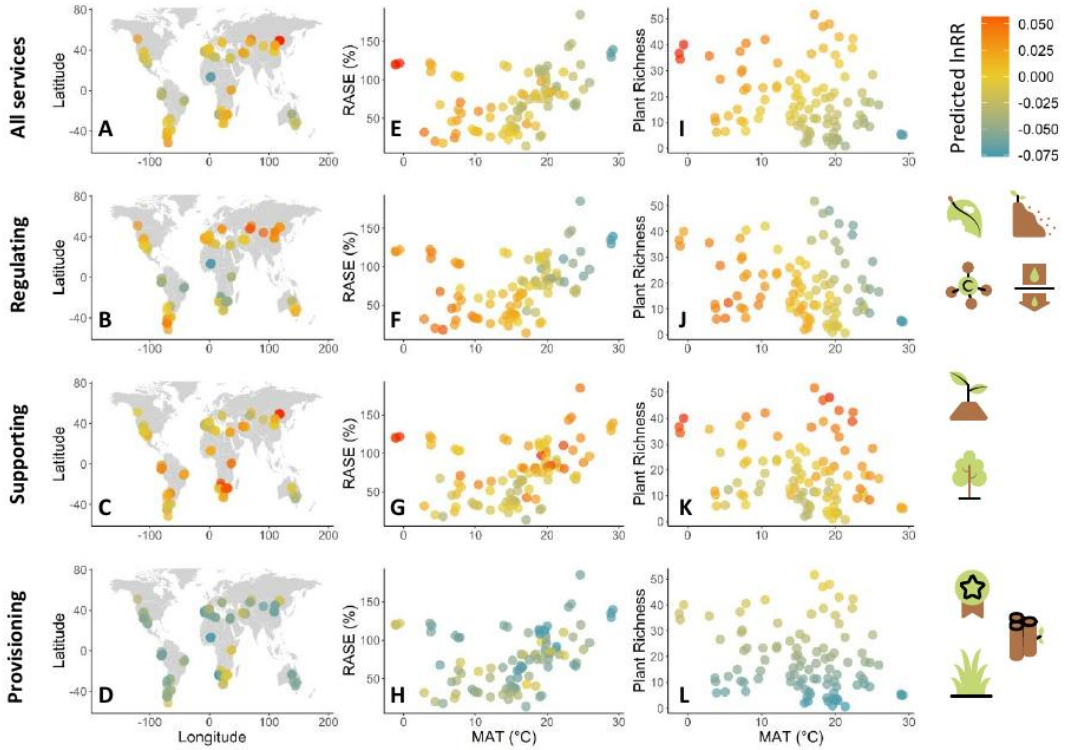
Protect the disturbance regime.

Avoid inappropriate afforestation · retain fire and grazing where ecologically necessary · restore native grasses and forbs.

Veldman et al. 2015 · BioScience 65:1011–1018 · Fig. 1.

DRYLANDS There is no universal “right” grazing intensity

The same pressure changes ecosystem services differently depending on climate, soils and biodiversity.



PRIORITY

Manage grazing in context.

The global pattern is the point:

warmer, species-poor drylands were more likely to lose ecosystem-service delivery as grazing pressure increased.

CONTEXT IS THE MANAGEMENT VARIABLE

Maestre et al. 2022 · Science 378:915–920 · original Fig. 4.

MANGROVES Restore the process before planting the trees

Hydrology can be the intervention. Planting may be unnecessary or actively fail if the stress remains.



PRIORITY

Restore tidal exchange and drainage.

Then ask whether natural recruitment resumes. Plant only when recovery is still propagule-limited.

1.52%

success in one 9,050-ha planting example cited in the review

18.4%

survival in a large Philippines planting programme cited in the review

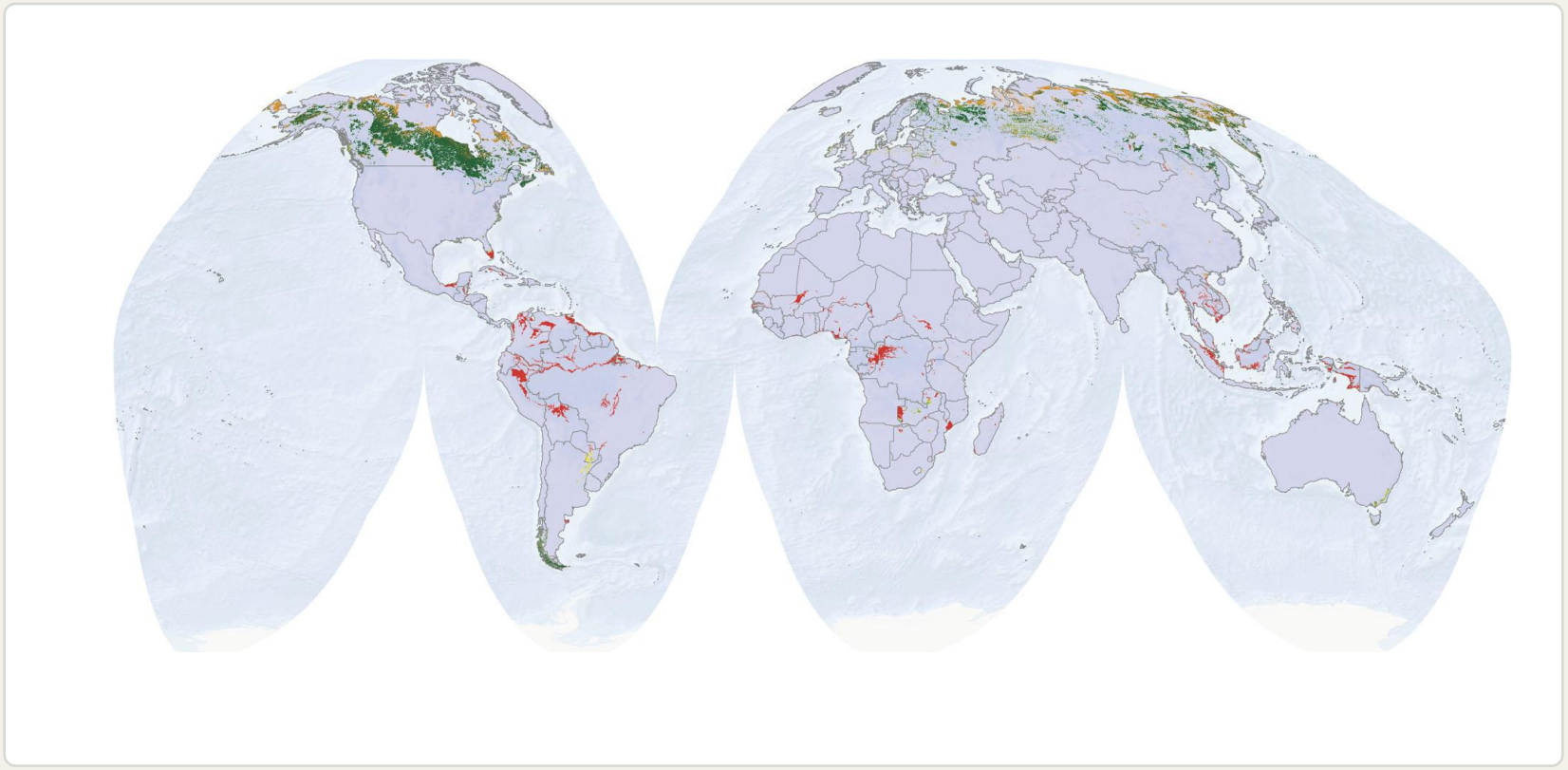
Diagnosis → remove stress → observe recovery → plant only if needed.

Lewis 2005 · Ecological Engineering 24:403–418 · real recovery sequence and review examples.

PEATLANDS

PEATLANDS The conservation action is often simply: keep them wet

Drainage converts long-term carbon stores into persistent greenhouse-gas sources.



~3%

of terrestrial surface

~21%

of global soil organic carbon stock estimated in peatlands

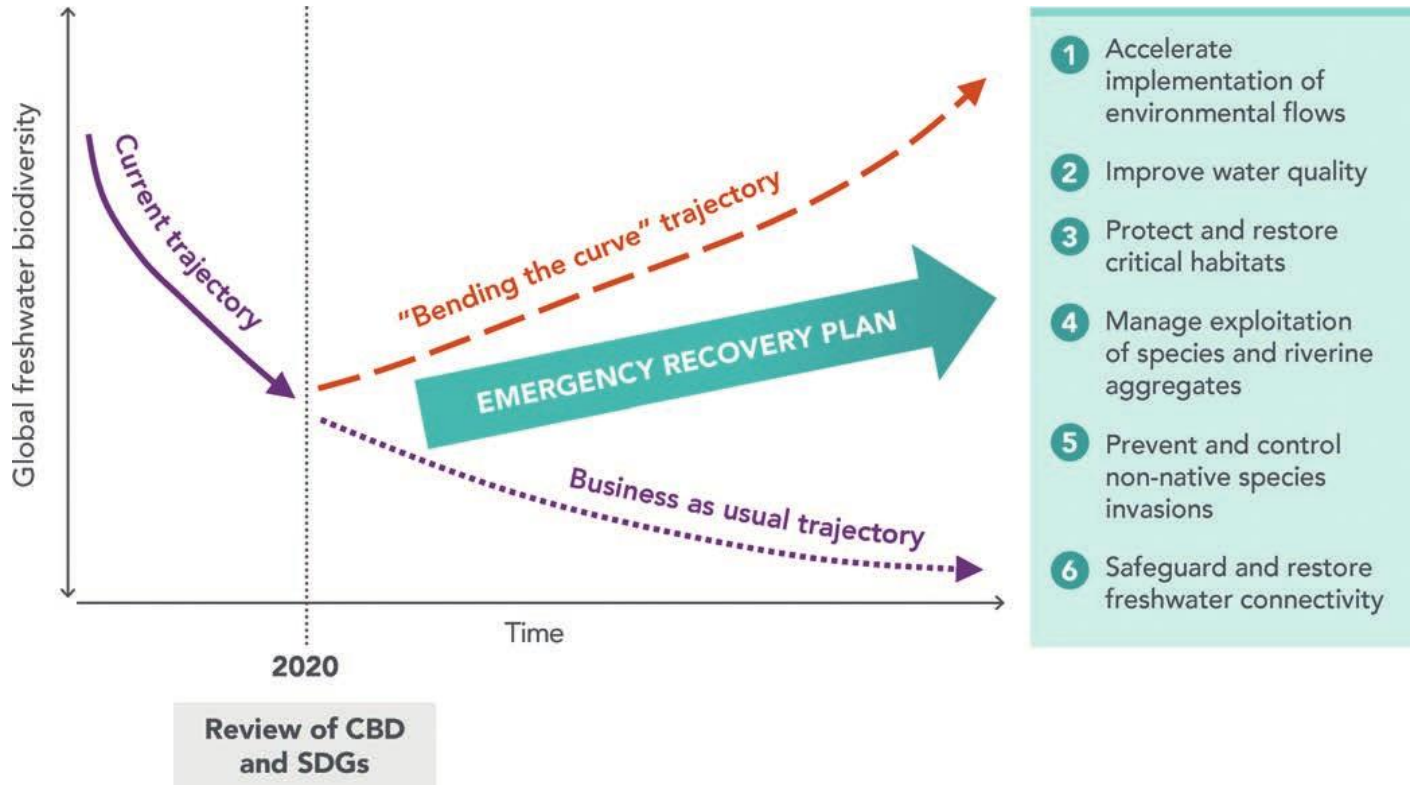
PRIORITY

Protect intact peat · rewet drained peat · prevent fire and further drainage.

Leifeld & Menichetti 2018 · Nature Communications 9:1071 · Fig. 1.

Freshwater conservation is a network problem

The priority is not one reserve: it is restoring the processes that move water, organisms, sediment and nutrients.



The six priorities as one integrated plan

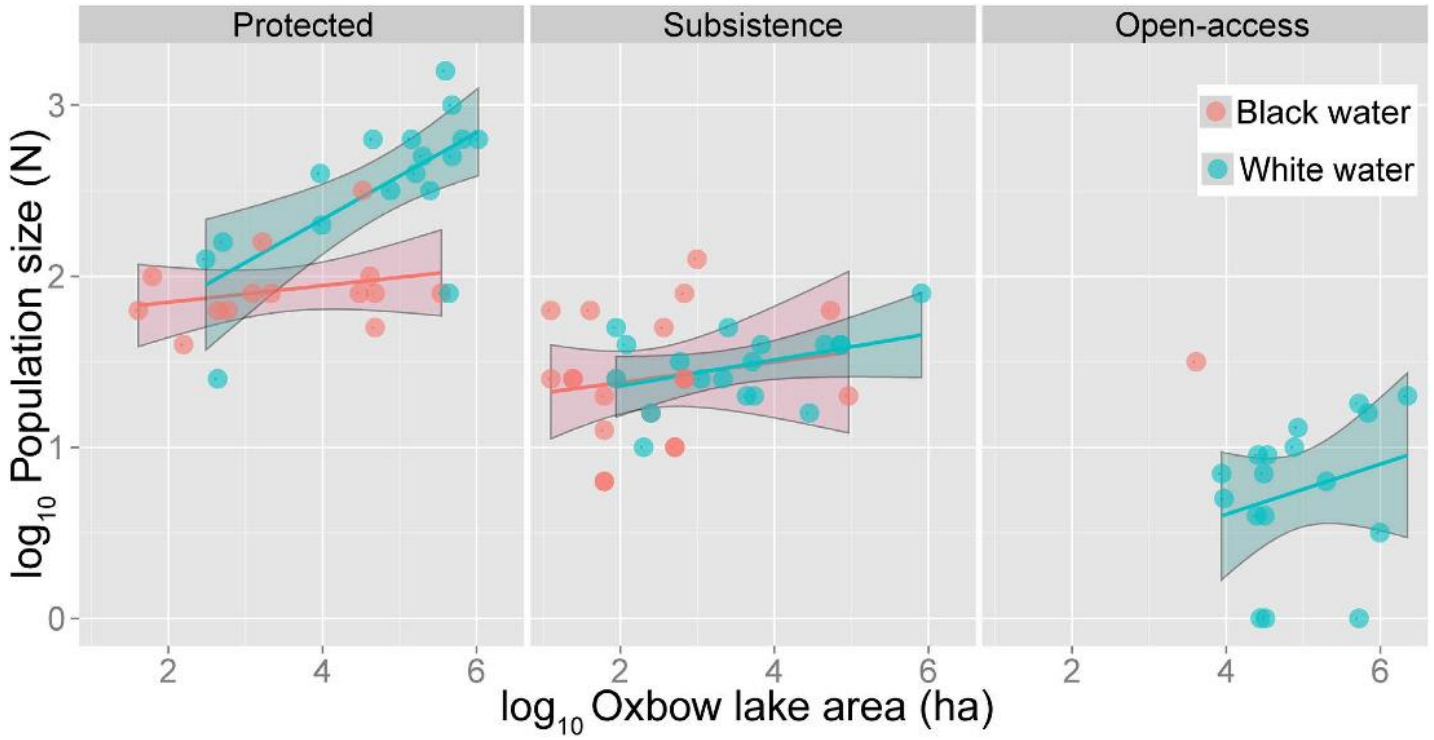
THINK AT BASIN SCALE

Flow + quality + habitat + exploitation + invasions + connectivity

Tickner et al. 2020 · BioScience 70:330–342 · Emergency Recovery Plan, Fig. 2.

A conservation success built around local monitoring

The original data show a strong management signal across protected, subsistence, and open-access lakes.



WHAT THE PAPER ADDS

Management class was a dominant predictor of arapaima stock size.

Annual counts were carried out collaboratively by trained fishers and used to set lake-specific harvest quotas.

The intervention is not only a fishing rule: monitoring, authority, surveillance and benefits reinforce each other.

Campos-Silva & Peres 2016 · Scientific Reports 6:34745 · original Fig. 4.

CORAL REEFS

CORAL REEFS Local management cannot keep a marine heatwave out

Protection still matters for recovery , but resistance to extreme heat is dominated by global warming.

2016

Great Barrier Reef

8.9%

of 1,156 surveyed reefs escaped bleaching

31%

experienced 8–16 Degree Heating Weeks

>4×

more reefs had extreme bleaching (>60%) than in 1998 or 2002

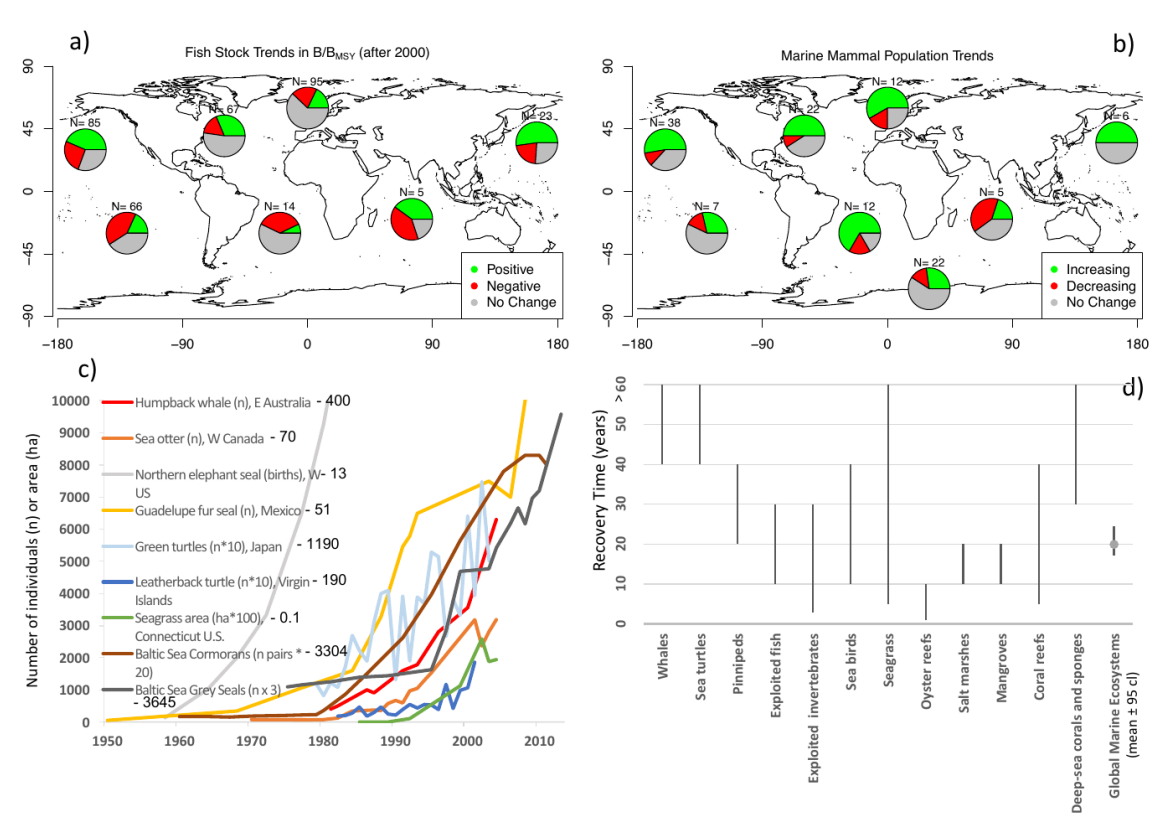
After heat stress was accounted for, protection status had no detectable effect on bleaching severity; water-quality effects were very small.

Priority: reduce local stress to support recovery and reduce warming to preserve a future for reefs.

Hughes et al. 2017 · Nature 543:373–377.

MARINE ECOSYSTEMRecovery is possible when pressures are actually reduced

The original synthesis shows both where recovery is occurring and how long it can take.



Recovery is possible but it depends on reducing the pressure and allowing enough time for rebuilding.

Duarte et al. 2020 · Nature · original Fig. 3.

Different ecosystems. Different processes. Different scales.

The question is not “which conservation tool is best?” but “which ecological process is non-negotiable here?”

FORESTS

Integrity

Protect intactness · reduce degradation and fragmentation

GRASSLANDS + SAVANNAS

Disturbance

Keep open structure · retain appropriate fire and grazing

DRYLANDS

Context

Set grazing to climate · soils · biodiversity

MANGROVES

Tidal hydrology

Restore exchange before planting

PEATLANDS

Water table

Prevent drainage · rewet degraded peat

FRESHWATER

Flow + connectivity

Work at basin scale · flows · quality · habitat · connectivity

MOUNTAINS

Climate pathways

Protect connected elevational gradients

CORAL REEFS

Recovery window

Reduce local stress + address global heat exposure

OPEN OCEAN

Pressure reduction

Manage harvest · pollution · habitat · climate

Match the intervention to the process, the pressure and the scale at which they operate.

Synthesis from Watson 2018; Veldman 2015; Maestre 2022; Lewis 2005; Leifeld & Menichetti 2018; Tickner 2020; Elsen 2018; Hughes 2017; Duarte 2020.

WHAT CHANGES ACROSS ECOSYSTEMS?

The word “conservation” hides very different ecological jobs

DISTURBANCE	CONNECTIVITY	HYDROLOGY	RECOVERY TIME	EXTERNAL PRESSURE
fire · grazing · flood pulses	corridors · rivers · elevational gradients	tidal exchange · water tables · environmental flows	years · decades · generations	warming · markets · upstream decisions

The transferable skill is not memorising interventions. It is diagnosing which process matters here.

Cross-ecosystem synthesis.

03 / PEOPLE + POWER

PEOPLE ARE PART OF THE CAUSAL SYSTEM.

Governance can change whether the same ecological intervention is implemented, maintained and trusted.

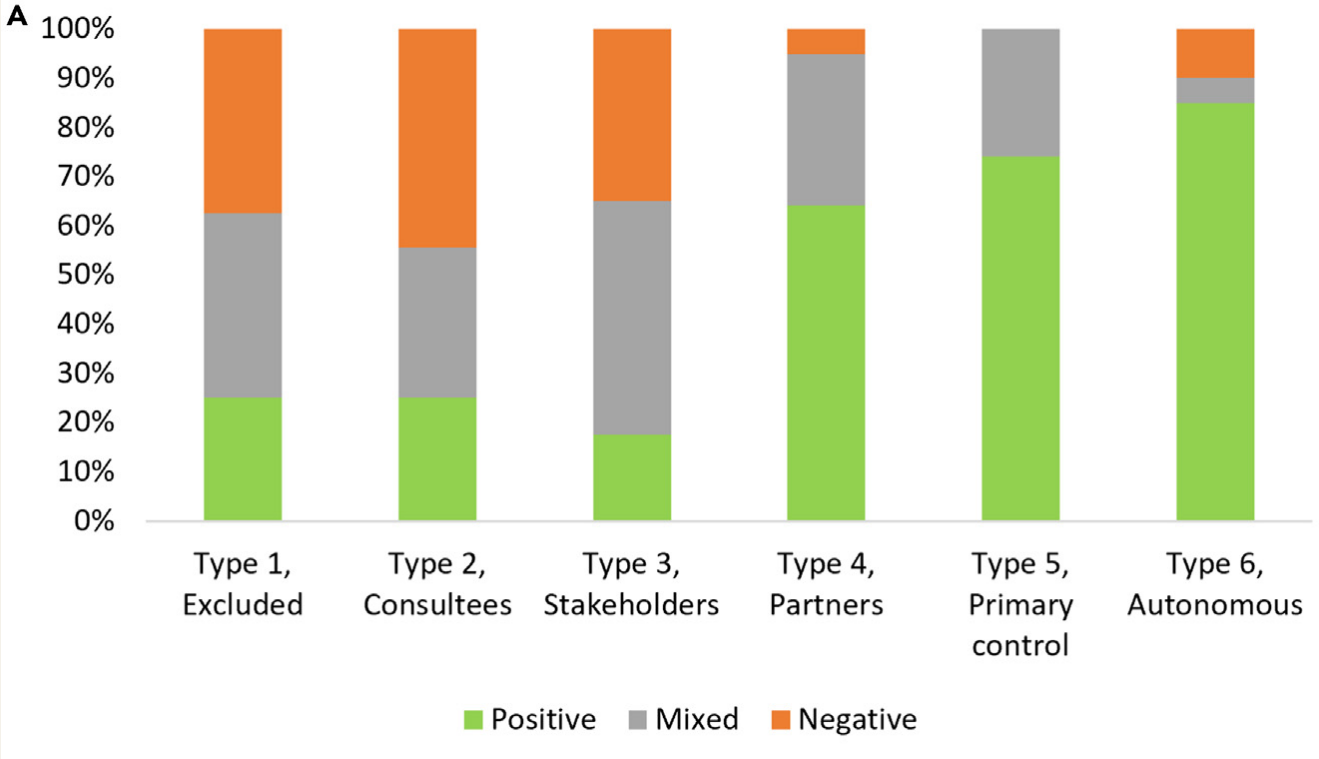


Real field photograph reused from Lesson 1 course material · governance evidence follows: Dawson et al. 2024.

GOVERNANCE EVIDENCE

Participation is not the same as power

Across 170 cases with ecological outcomes, more equitable governance was associated with more positive outcomes.



The shift is not from "no community" to "community present".

It is from being consulted to having meaningful authority, recognition and control.

GOVERNANCE CAN CHANGE OUTCOMES

Ask not only "who participates?" — ask "who can decide?"

Dawson et al. 2024 · One Earth 7 · original Fig. 2A (ecological outcomes).

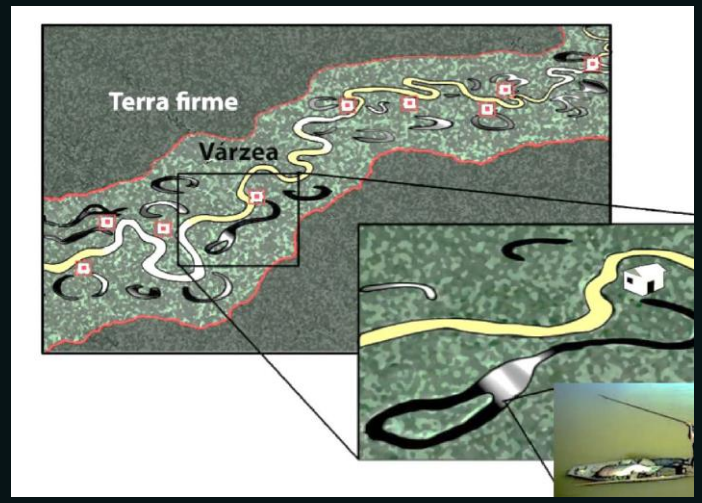
A DIFFERENT CENTRE OF GRAVITY

The Global South is not a conservation footnote

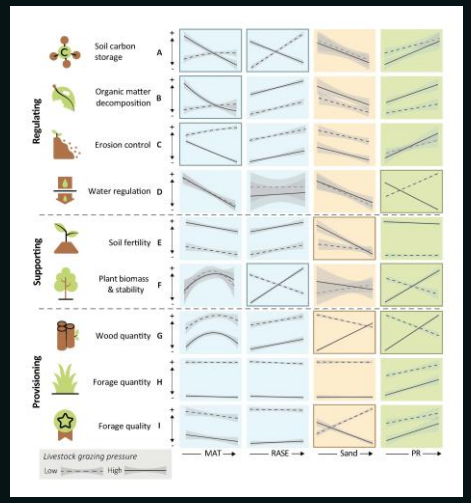
Many of the strongest lessons in this deck are about locally led management, customary institutions and context-specific ecological knowledge.



CERRADO



JURUÁ AMAZONIA



GLOBAL DRYLANDS

Leadership is not only about applying science elsewhere. It is also about whose knowledge shapes the science and the decision.

Real figures/photos: Veldman et al. 2015; Campos-Silva & Peres 2016; Maestre et al. 2022.

04 / COMMUNICATION

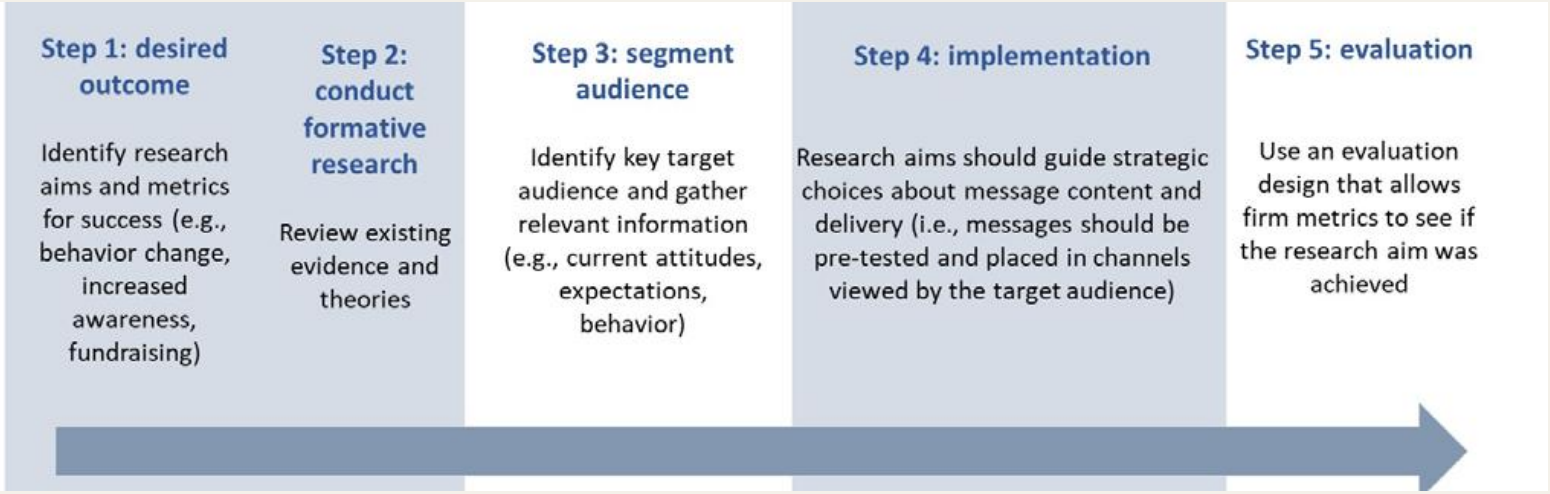
SCIENCE DOES NOT MOVE BY DATA ALONE.

Communication, education and collective action are interventions too and they should be evaluated like interventions.



A message needs an outcome, not just information

The conservation-messaging literature argues for planning, implementation and evaluation not simply “raising awareness”.



What do I want this audience to do?

Then choose the audience, frame, messenger and channel and evaluate the outcome.

COMMUNICATION = MANAGEMENT

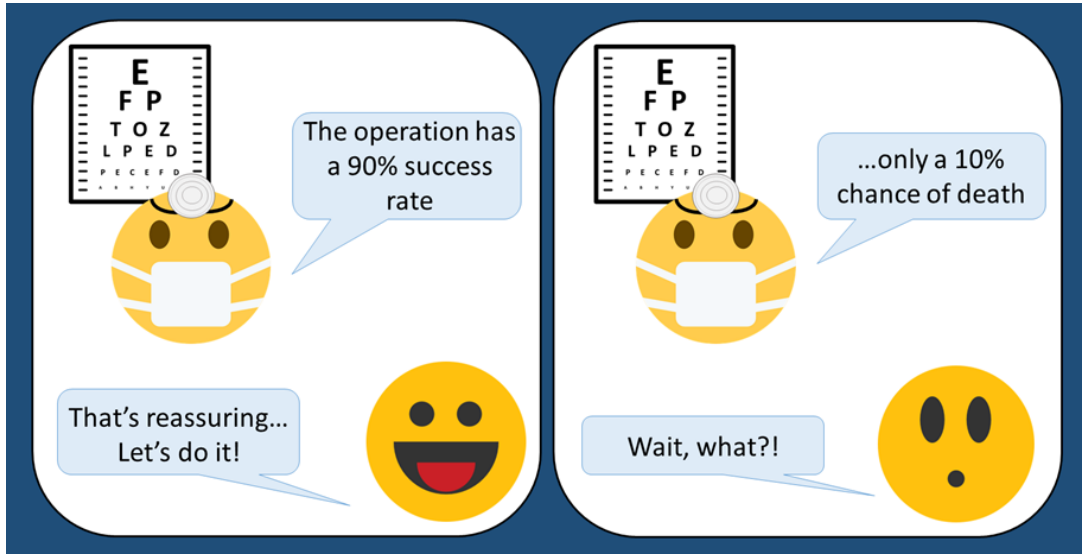
A message is an intervention. Define the outcome before you design the message.

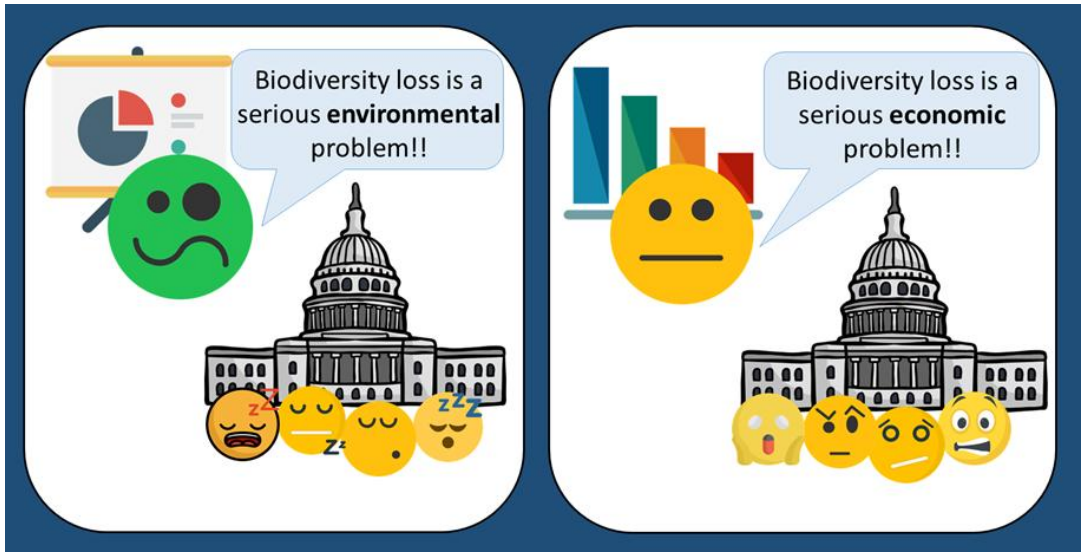
Kidd et al. 2019 · Biological Conservation 236:92–99 · original Fig. 1 (cropped for legibility).

FRAMING

How you say it can change how people hear it

Framing does not mean hiding evidence. It means recognising that every message emphasizes some aspect of reality.





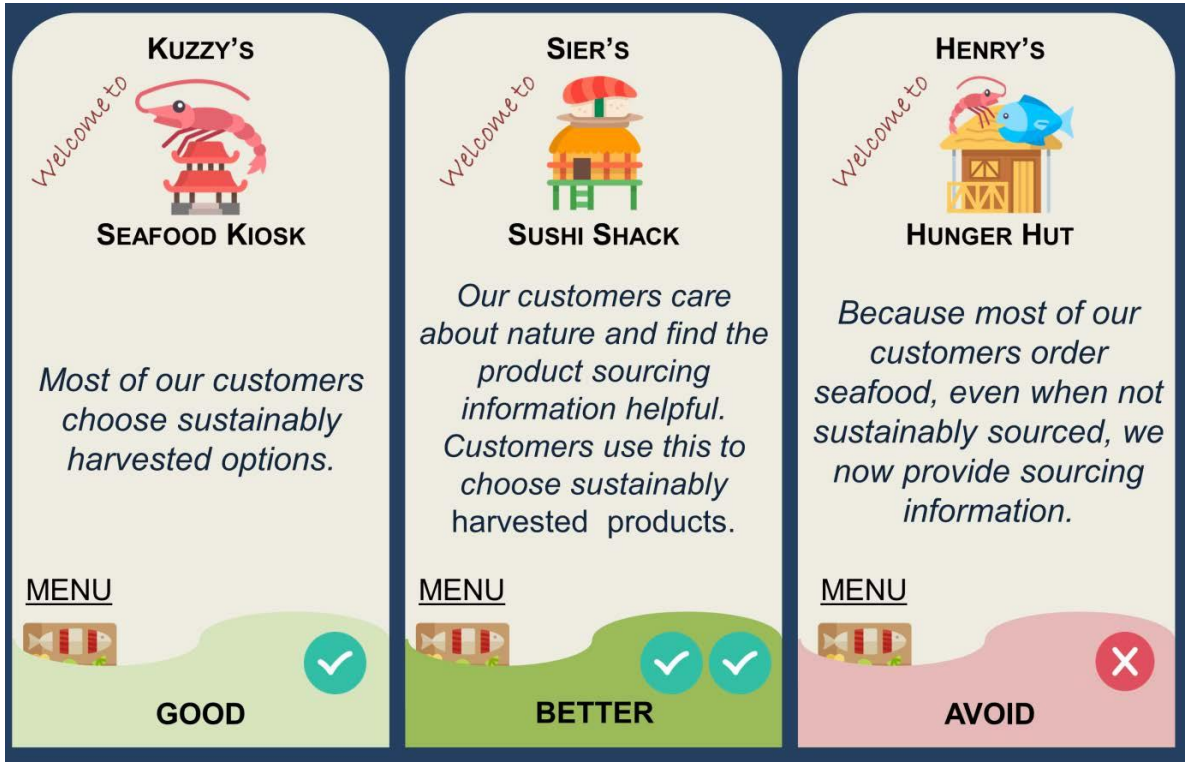
Same evidence. Different frame. Different response.

Kusmanoff et al. 2020 · Conservation Biology 34:1131–1141 · Figs. 1–2.

SOCIAL NORMS

A badly framed norm can advertise the behavior you want to stop

Messages about what "most people do" can help — or accidentally normalize the undesirable behavior



Do not only ask "is this message true?" Ask "what norm does it make visible?"

Kusmanoff et al. 2020 · Conservation Biology 34:1131–1141 · Fig. 3.

EVIDENCE GAP IN CONSERVATION COMMUNICATION

Awareness is not the same as behavior

29 / 89

reviewed studies did not state a target audience

37%

of messaging case studies did not evaluate effectiveness

5

studies measured specific behavioral change

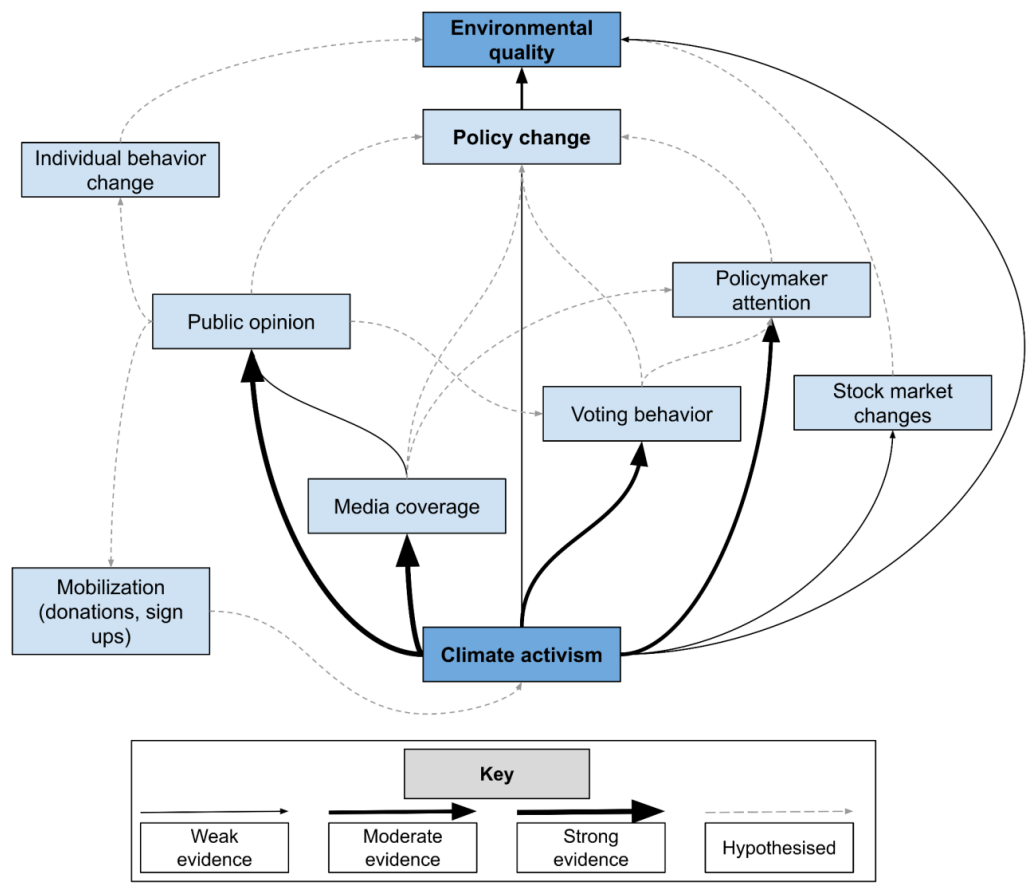
A memorable message can still fail if it changes nothing that matters to the pressure, behavior or decision.

Kidd et al. 2019 · systematic review of 89 conservation-messaging studies.

COLLECTIVE ACTION

Activism can move attention and opinion, but evidence thins toward environmental outcomes

The strongest evidence is for public opinion and media coverage; policy and emissions are harder to attribute.



WHAT WE CAN SAY

Strong evidence:

public opinion · media coverage

Moderate evidence:

voting · policymaker attention · financial pressure

Still thin:

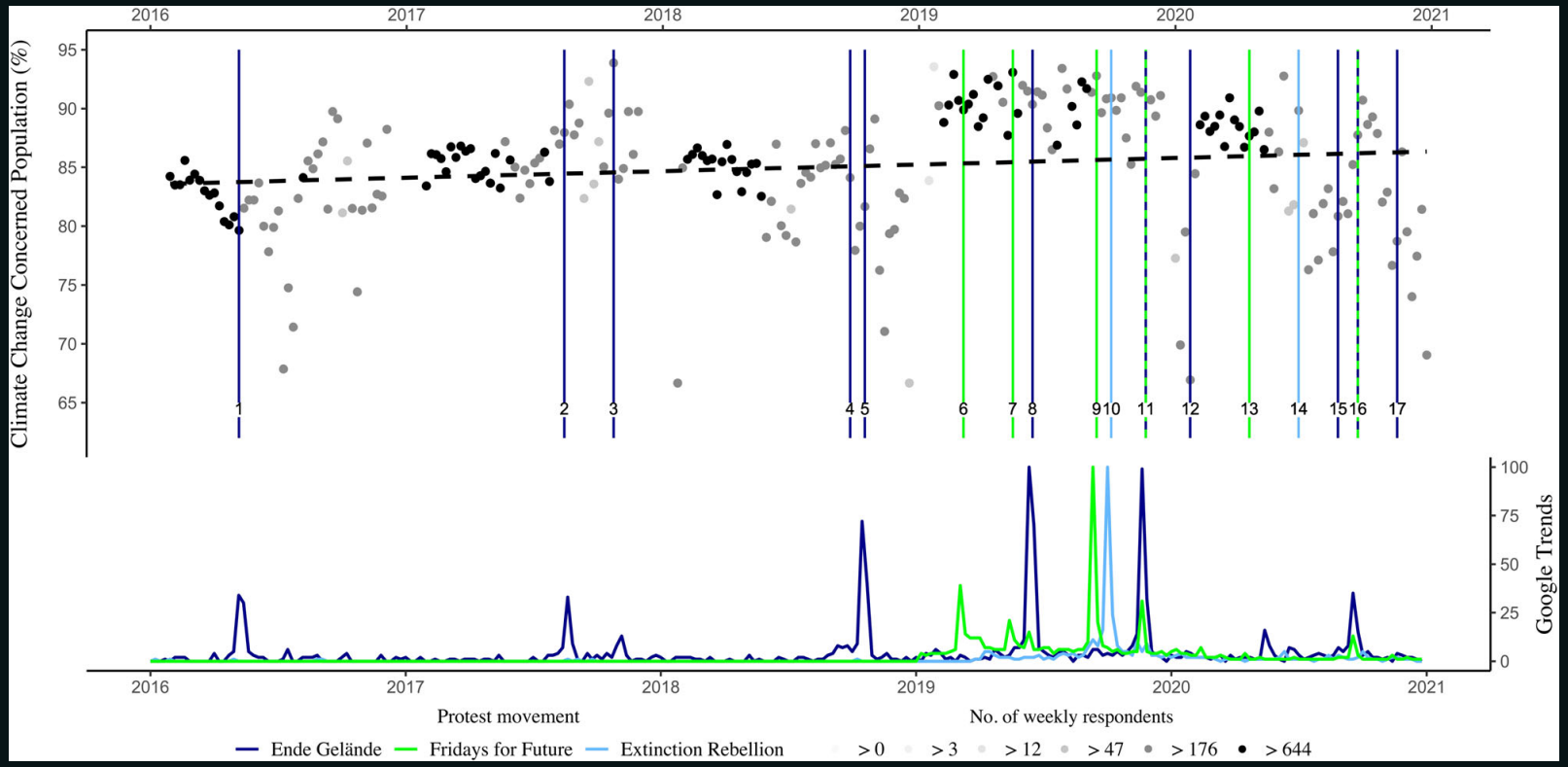
policy change · emissions · environmental quality

Thomas-Walters et al. 2025 · Current Opinion in Behavioral Sciences · Fig. 1.

COLLECTIVE ACTION — A SPECIFIC TEST

Do protests change minds?

A quasi-experimental study in Germany found a measurable, but modest, shift in climate concern after protests.



+1.2

percentage points

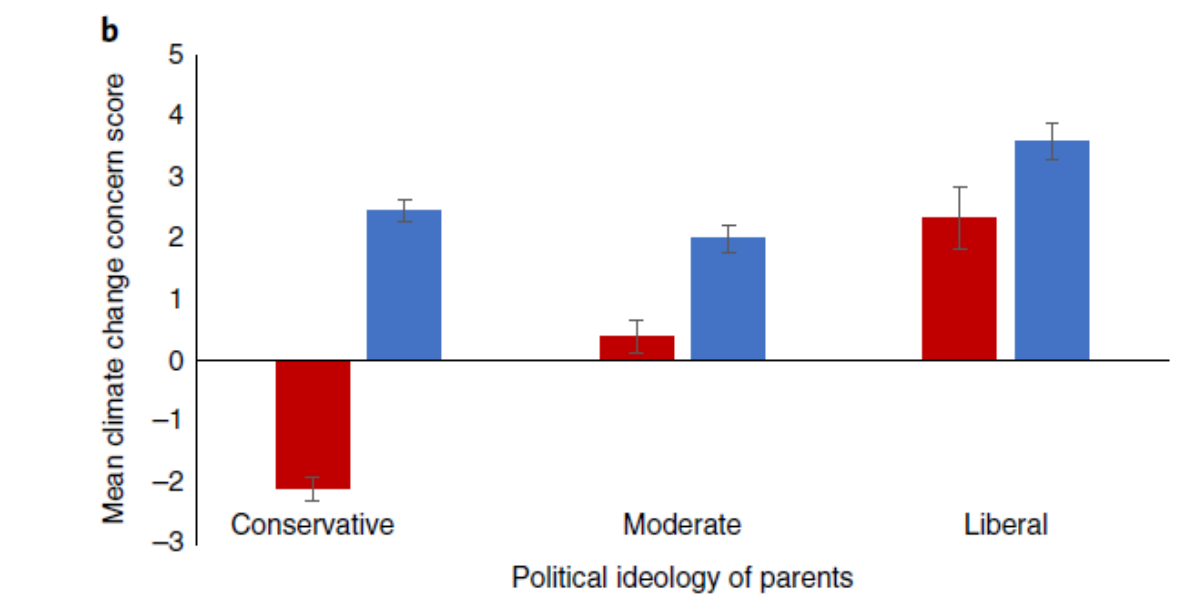
average increase in climate-change concern in the 14 days after a protest

Brehm & Gruhl 2024 · Nature Communications 15:2916 · original Fig. 1; effect estimate reported in the paper.

NEW GENERATIONS

Young people are not only “future stakeholders”

Learning can travel from children to adults changing concern even among groups least receptive at baseline.



+4.29

points more change in parent climate concern in the treatment group

The strongest gains were among conservative parents the group with the lowest baseline concern.

Learning can travel upward across generations.

GIVE YOUNG PEOPLE AGENCY NOW

Lawson et al. 2019 · Nature Climate Change 9:458–462 · original Fig. 1 and reported results.

NEW GENERATIONS — INSTITUTIONAL CHANGE

27 students can move an institution.

Pacific Islands Students Fighting Climate Change began in a university classroom and helped carry a climate-justice question to the world's highest court.

2019

27 law students

University of the South Pacific

2023

UN General Assembly

request adopted by consensus

23 JUL 2025

ICJ Advisory Opinion

States' climate obligations clarified

THE POINT

Young people are not only future stakeholders.

They can change the rules under which decisions are made.

Sources: Pacific Islands Students Fighting Climate Change; International Court of Justice, Advisory Opinion of 23 July 2025.

05 / DECISION

SO WHAT MAKES A DECISION DEFENSIBLE?

ECOLOGICAL FIT

EVIDENCE

FEASIBILITY

EQUITY

REVISION

Not certainty.
A transparent argument you can revisit.

NOW DEFEND YOUR OWN DECISION

Your project is the final test.

10 MINUTES
presentation

+ 5 MINUTES
questions

8 POINTS
group project

MAKE THE DECISION VISIBLE

case + objective · evidence · strategy · 10-year outcome · monitoring + revision

Do not sell us certainty. Show us why your choice is defensible.

And tell us what evidence would make you change it.

THE LAST SLIDE

THE FUTURE IS NOT DECIDED.

Evidence matters.
People matter.
What you do next matters.

WHAT EVIDENCE WOULD CHANGE YOUR MIND?

