HAWAIIAN HOME LANDS

HAWAIIAN HOMES COMMISSION · DEPARTMENT OF HAWAIIAN HOME LANDS

G-1

In-Depth Update on Climate Change and Resilience Issues Affecting Hawaiian Home Lands, Statewide

November 15-16, 2021

Previous HHC Updates

HHC Meeting	Item No. & Title	Topics / Description
July 2021 (Virtual)	Item No. G-3, Update on Statewide Initiatives and Actions Related to Climate Change and Resilience	Reviewed federal, state & county activities July 2019 to July 2021; summarized DHHL initiatives re: community resilience planning, wetland restoration, and cesspool conversion; discussed climate justice and climate adaptation ideas for natural and working lands.
June 2019 (O'ahu)	Item G-1, Update on DHHL Efforts: Climate Change and Sea Level Rise Adaptation, Community Resilience and Hazard Mitigation on Hawaiian Home Lands, Statewide	Reviewed federal-, state- & county-level activities over previous year; focus on best practices and integration of coastal zone management, community resilience, disaster preparedness, vulnerability analysis & hazard mitigation planning.
April 2019 (Molokai)	Item G-3, Moloka'i Planning Projects Status (pages 5-15)	So. Molokai Shoreline Erosion Management Plan (SM-SEMP) Phase I; CCA & SLR planning at federal, state & county levels.
June 18-19, 2018 (O'ahu)	Item G-4, Update on DHHL Efforts: Climate Change & Sea Level Rise Adaptation, Community Resilience & Hazard Mitigation on Hawaiian Home Lands, Statewide	First update, per HHC request at April 2018 meeting. Reviewed federal, state and county activities Sept. 2016 to June 2018. Continued to recommend integrated, ahupua'a based approach.
September 19-20, 2016 (Maui)	Item G-6, Planning for our Makai Communities - Integrating Coastal Zone Management, Community Resilience & Hazard Mitigation on Hawaiian Home Lands Along the Shoreline, Statewide	Outlined CZM jurisdictional issues, DHHL CZM reviews, CZM, CCA, CRP & disaster preparedness efforts at state, county and homestead community levels; listed potential funding sources.

Climate Change is here, now

International-Level Activities

UNITED NATIONS

UNEP

ipcc

INTERGOVERNMENTAL PANEL ON climate change

WMO UNEP

UNFCCC

United Nations Framework Convention on Climate Change

UNFCCC - Addressing Climate Change

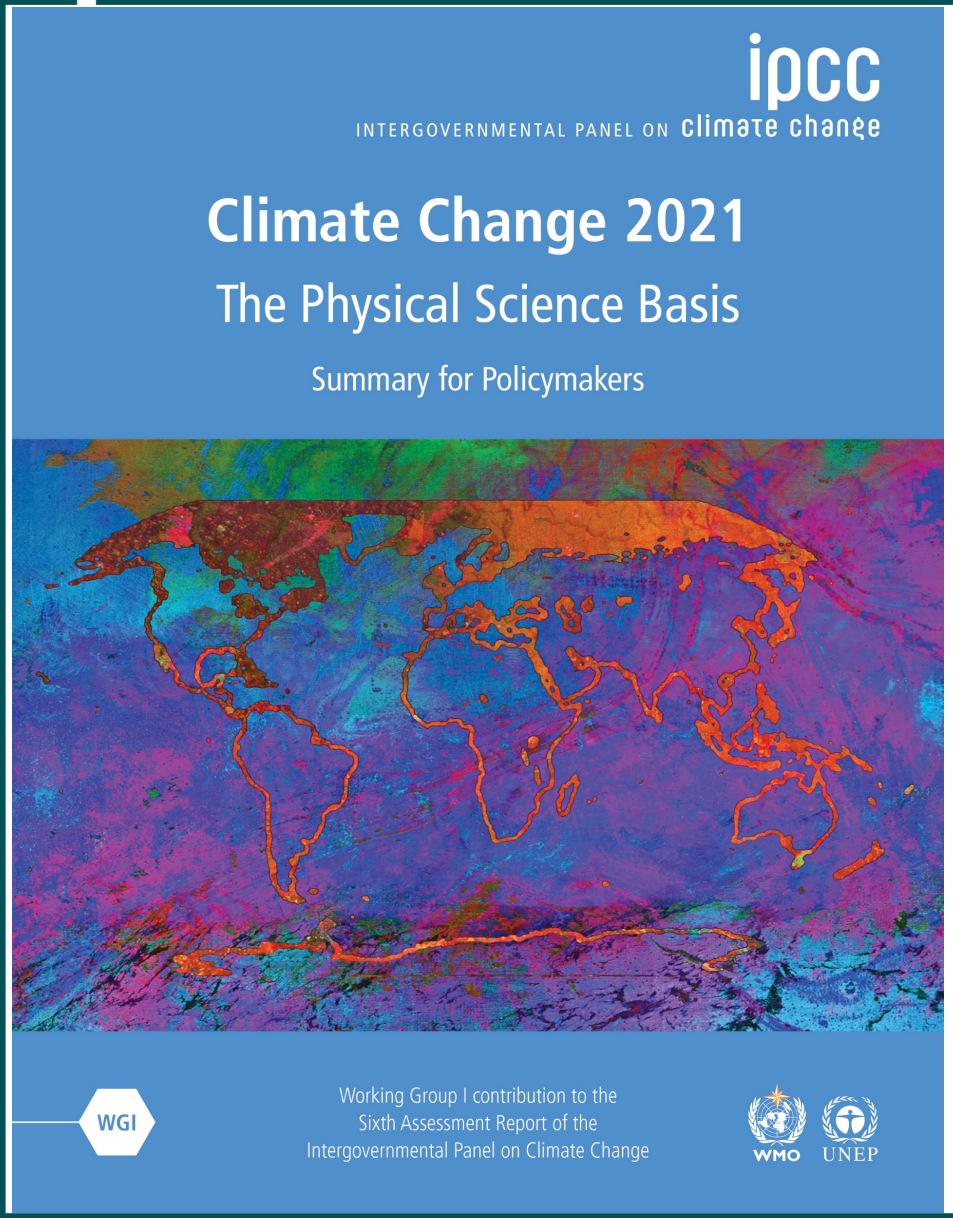
- United Nations Framework Convention on Climate Change entered into force in 1994
- To date, 197 countries have ratified and are Parties to the Convention
- Objective is to stabilize greenhouse gas concentrations "at a level that would prevent dangerous anthropogenic (human induced) interference with the climate system."
- "Such a level should be achieved within a time-frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened, and to enable economic development to proceed in a sustainable manner."

IPCC's AR6 – the Factual, Scientific Basis

The Sixth Assessment reports (AR6) are comprised of three Working Groups Assessment Reports:

- WGI – The Physical Science Basis (Aug. 2021),
- WGII – Impacts, Adaptation and Vulnerability (in process),
- WGIII – Mitigation of Climate Change (in process) and three Special Reports:
- Global Warming of 1.5°C (Oct. 2018),
- Climate Change and Land (Aug. 2019),
- The Ocean and Cryosphere in a Changing Climate (Sept. 2019)

WGI – The Physical Science Basis



Headline Statements from the Summary for Policymakers

A. The Current State of the Climate
B. Possible Climate Futures
C. Climate Information for Risk Assessment and Regional Adaptation
D. Limiting Future Climate Change

AR6 WGI – A. The Current State of the Climate

A.1 It is unequivocal that human influence has warmed the atmosphere, ocean and land. Widespread and rapid changes in the atmosphere, ocean, cryosphere and biosphere have occurred.

A.2 The scale of recent changes across the climate system as a whole and the present state of many aspects of the climate system are unprecedented over many centuries to many thousands of years.

A.3 Human-induced climate change is already affecting many weather and climate extremes in every region across the globe. *Evidence of observed changes in extremes such as heatwaves, heavy precipitation, droughts, and tropical cyclones, and, in particular, their attribution to human influence, has strengthened since the Fifth Assessment Report (AR5).*

A.4 Improved knowledge of climate processes, paleoclimate evidence and the response of the climate system to increasing radiative forcing gives a best estimate of equilibrium climate sensitivity of 3°C, with a narrower range compared to AR5.

AR6 WGI – B. Possible Climate Futures

B.1 Global surface temperature will continue to increase until at least the mid-century under all emissions scenarios considered. Global warming of 1.5°C and 2°C will be exceeded during the 21st century unless deep reductions in carbon dioxide (CO2) and other greenhouse gas emissions occur in the coming decades.

B.2 Many changes in the climate system become larger in direct relation to increasing global warming. They include increases in the frequency and intensity of hot extremes, marine heatwaves, and heavy precipitation, agricultural and ecological droughts in some regions, and proportion of intense tropical cyclones, as well as reductions in Arctic sea ice, snow cover and permafrost.

B.3 Continued global warming is projected to further intensify the global water cycle, including its variability, global monsoon precipitation and the severity of wet and dry events.

B.4 Under scenarios with increasing CO2 emissions, the ocean and land carbon sinks are projected to be less effective at slowing the accumulation of CO2 in the atmosphere.

***B.5** Many changes due to past and future greenhouse gas emissions are irreversible for centuries to millennia, especially changes in the ocean, ice sheets and global sea level.*

AR6 WGI – C. Climate Information for Risk Assessment and Regional Adaptation

C.1 Natural drivers and internal variability will modulate human-caused changes, especially at regional scales and in the near term, with little effect on centennial global warming. These modulations are important to consider in planning for the full range of possible changes.

C.2 With further global warming, every region is projected to increasingly experience concurrent and multiple changes in climatic impact-drivers. Changes in several climatic impact-drivers would be more widespread at 2°C compared to 1.5°C global warming and even more widespread and/or pronounced for higher warming levels.

C.3 *Low-likelihood outcomes, such as ice sheet collapse, abrupt ocean circulation changes, some compound extreme events and warming substantially larger than the assessed very likely range of future warming cannot be ruled out and are part of risk assessment.*

AR6 WGI - D. Limiting Future Climate Change

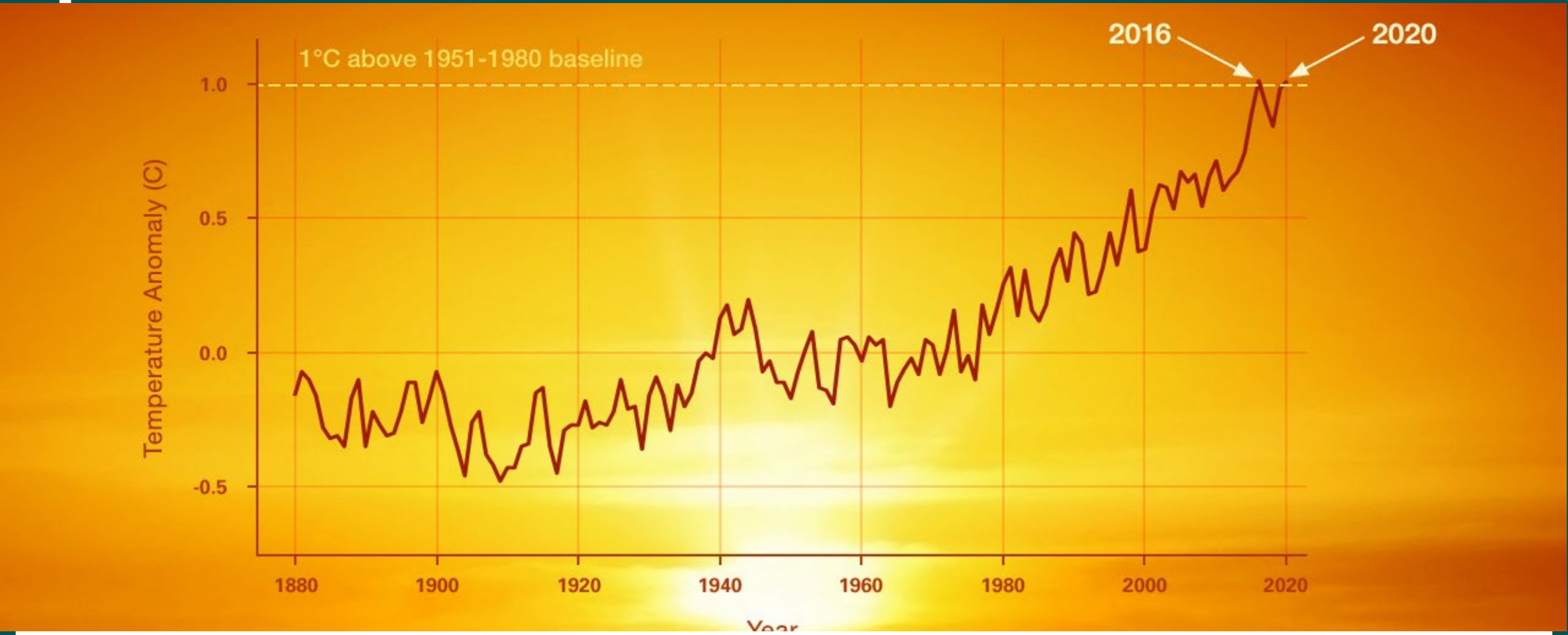
D.1 From a physical science perspective, limiting human-induced global warming to a specific level requires limiting cumulative CO2 emissions, reaching at least net zero CO2 emissions, along with strong reductions in other greenhouse gas emissions. Strong, rapid and sustained reductions in CH4 emissions would also limit the warming effect resulting from declining aerosol pollution and would improve air quality.

D.2 Scenarios with low or very low greenhouse gas (GHG) emissions (SSP1-1.9 and SSP1-2.6) lead within years to discernible effects on greenhouse gas and aerosol concentrations, and air quality, relative to high and very high GHG emissions scenarios (SSP3-7.0 or SSP5-8.5). Under these contrasting scenarios, discernible differences in trends of global surface temperature would begin to emerge from natural variability within around 20 years, and over longer time periods for many other climatic impact-drivers (high confidence).

Climate Justice Implications for Hawai'i and other Pacific Islands

- Changes in ocean, ice sheets and global sea levels are **irreversible**
- Island nations with the **least** responsibility for contributing to climate change (Tuvalu, Maldives) will suffer the **most severe** impacts

126 Nobel Laureates - Statement to G7 Summit



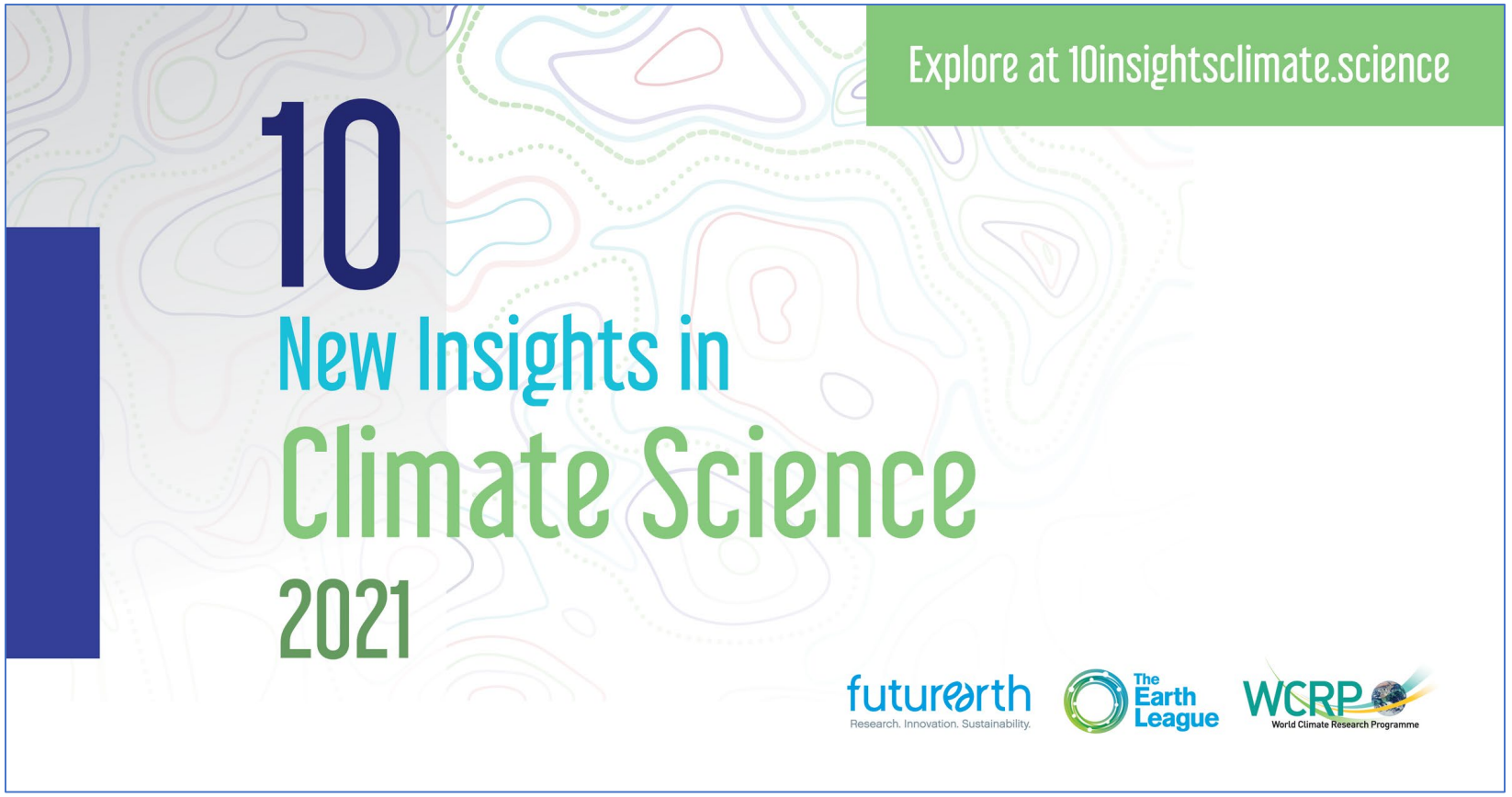
"Without transformational action this decade, humanity is taking colossal risks with our common future. Societies risk large-scale, irreversible changes to Earth's biosphere."

COP26 –UN Climate Change Conference 2021

- Held in Glasgow, Scotland from October 31 to November 12, 2021
- Second week focused on high level negotiations regarding
  - countries' Nationally Determined Contributions (NDC's) to Greenhouse Gas (GHG) emissions,
  - commitments to funding climate adaptation and mitigation strategies, and
  - levels of assistance provided to countries with developing economies.
- PO will report on outcomes at next HHC Meeting

COP26 – 10 Insights in Climate Science 2021

Released early on at COP26, the annual report scans what the latest findings and most important new emerging fields are and summarizes this in 10 important scientific insights



10 Insights in Climate Science 2021

1. Stabilizing at 1.5°C (2.7°F) warming is still possible, but immediate and drastic global action is required

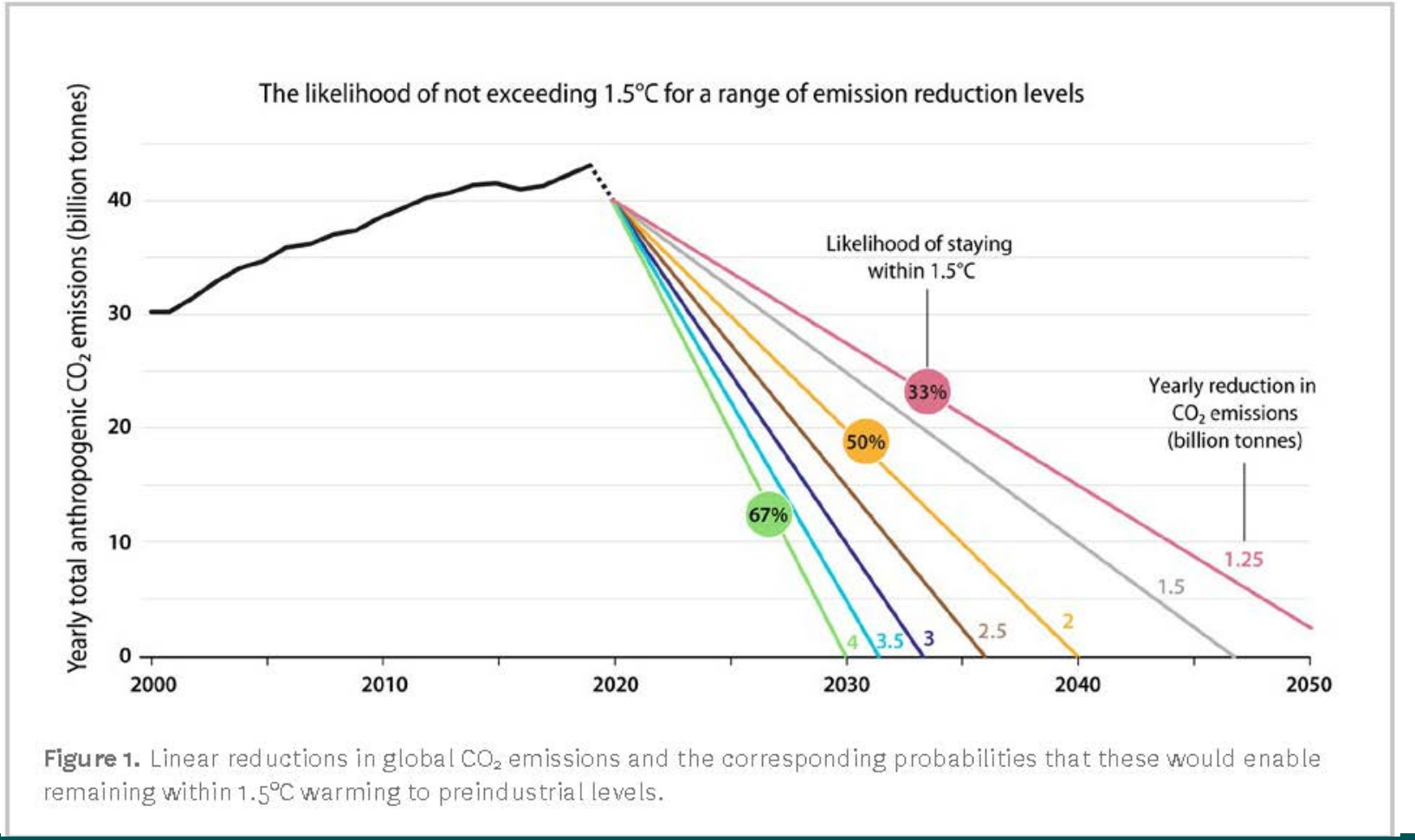
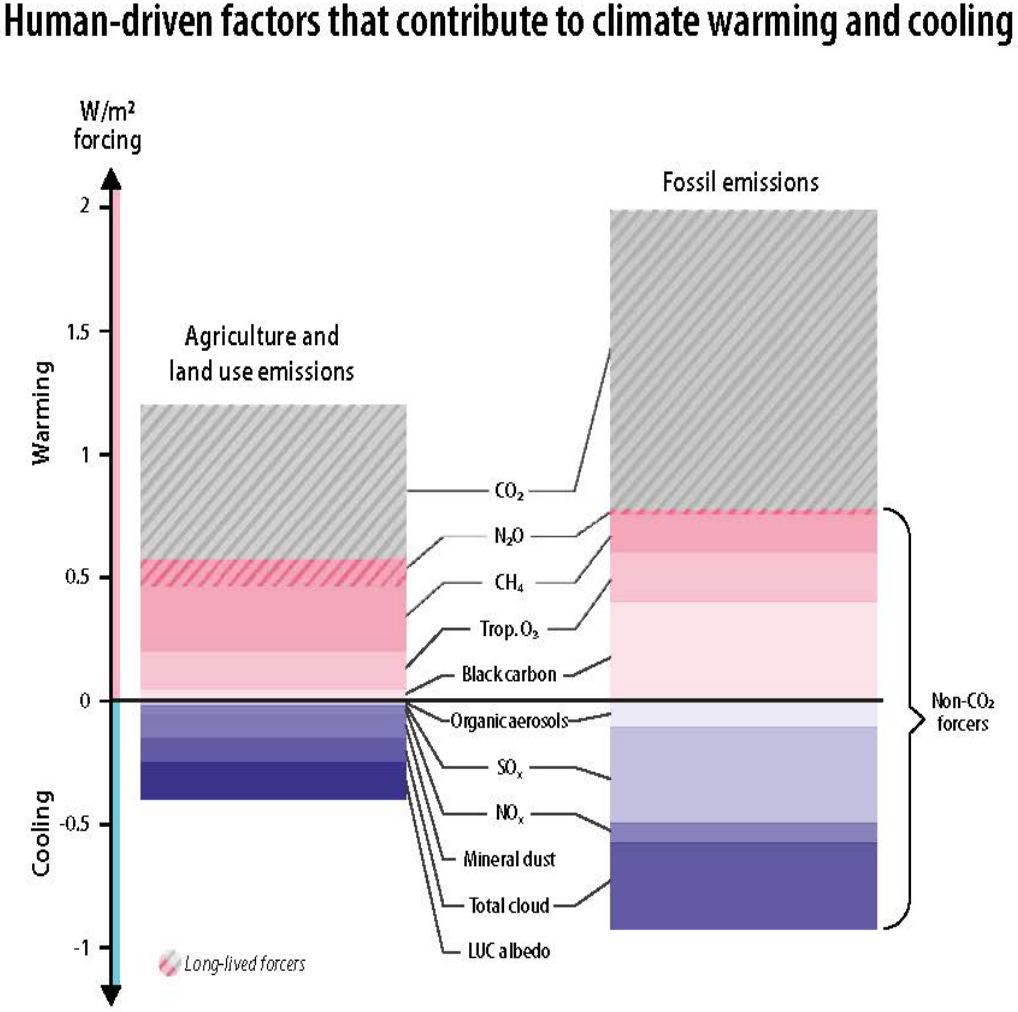


Figure 1. Linear reductions in global CO_2 emissions and the corresponding probabilities that these would enable remaining within 1.5°C warming to preindustrial levels.

10 Insights in Climate Science 2021

2. Rapid growth in methane and nitrous oxide emissions put us on track for 2.7°C (4.8°F) warming



10 Insights in Climate Science 2021

3. Megafires — Climate change forces fire extremes to reach new dimensions with extreme impacts

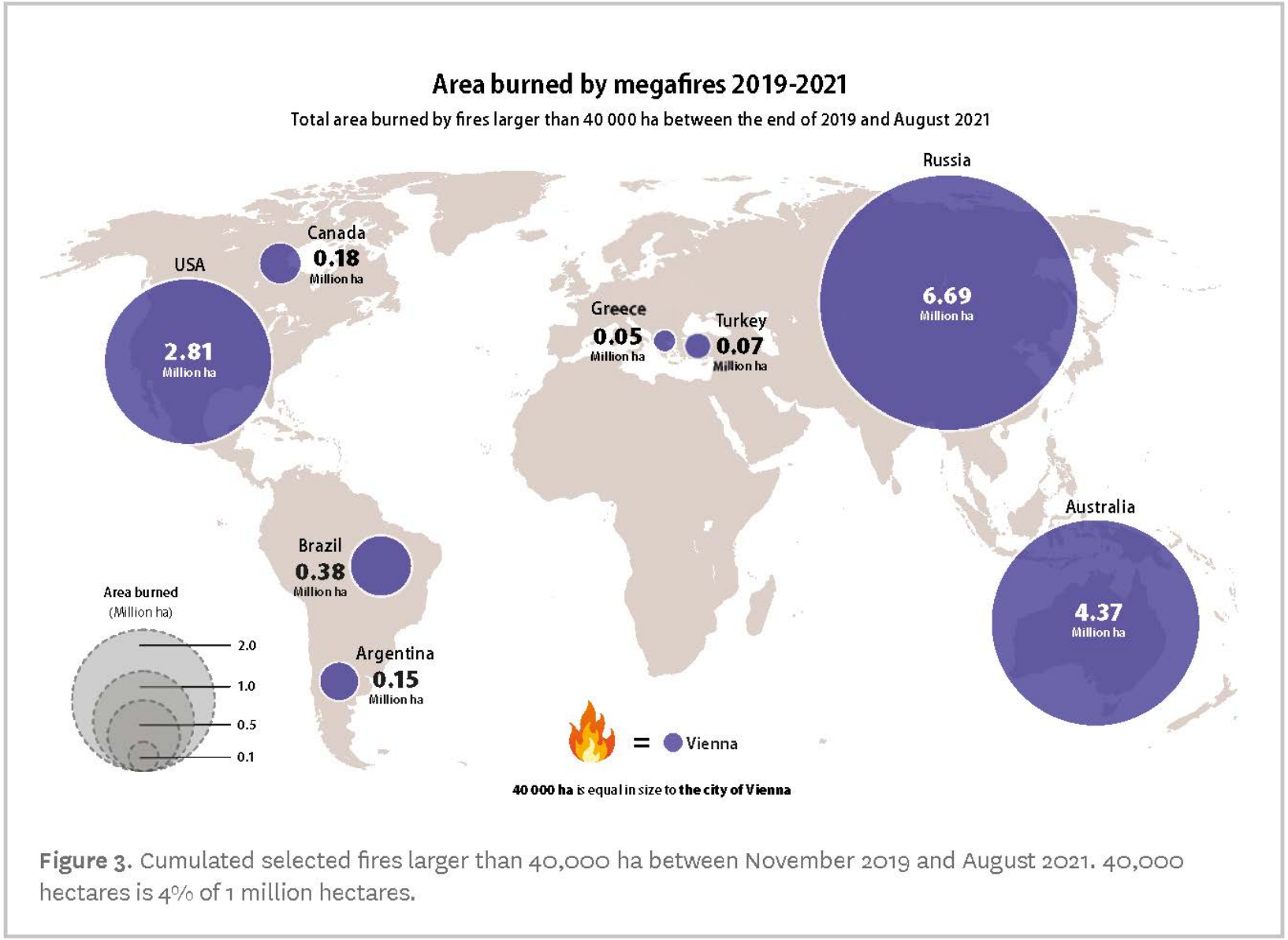


Figure 3. Cumulated selected fires larger than 40,000 ha between November 2019 and August 2021. 40,000 hectares is 4% of 1 million hectares.

10 Insights in Climate Science 2021

4. Climate tipping elements incur high-impact risks

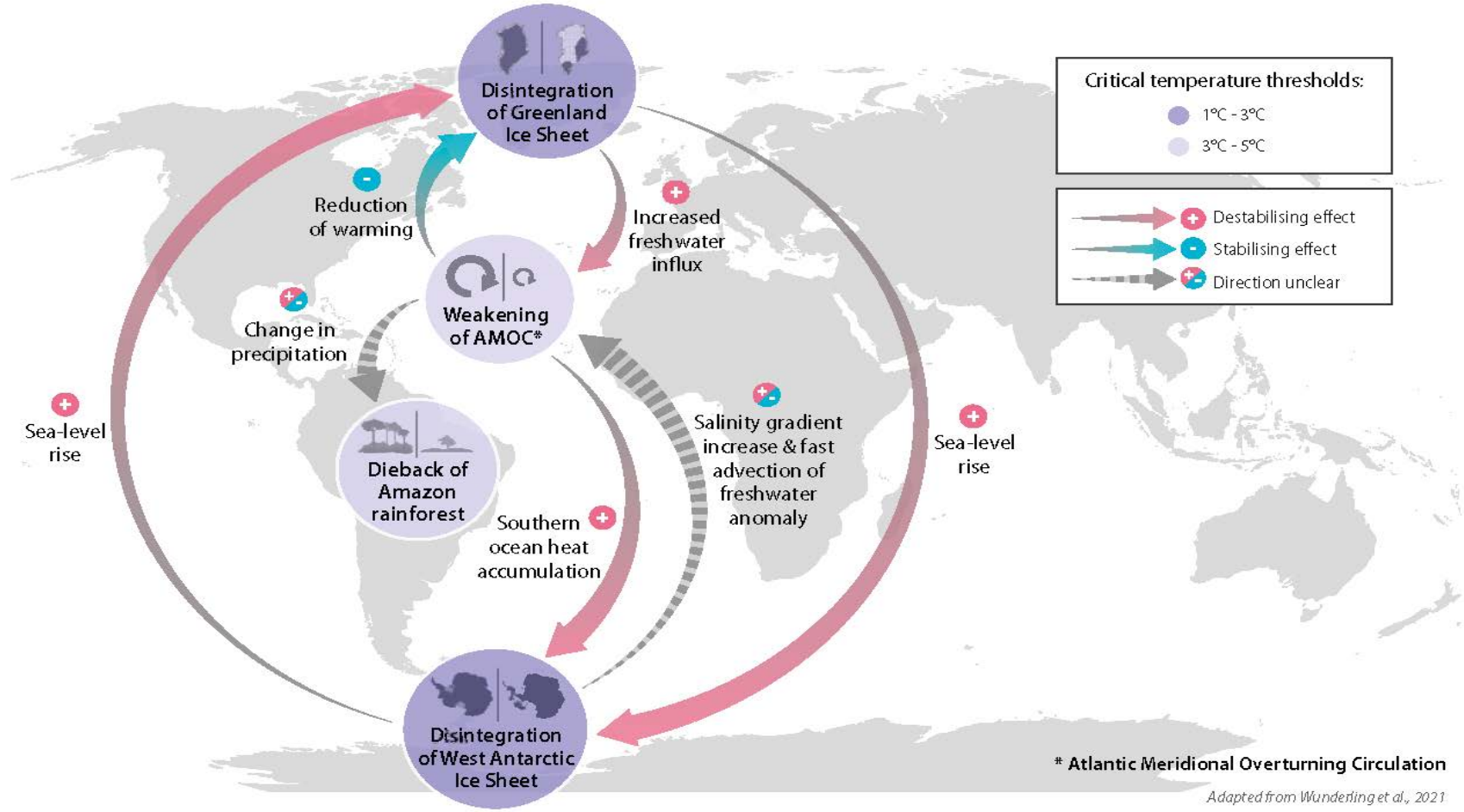


Figure 5. Physical interactions between four selected climate tipping elements: Greenland and West Antarctic Ice Sheets, Atlantic Meridional Overturning Circulation (AMOC) and Amazon rainforest (see reference in Martin et al., 2021).

10 Insights in Climate Science 2021

5. Global climate action must be just

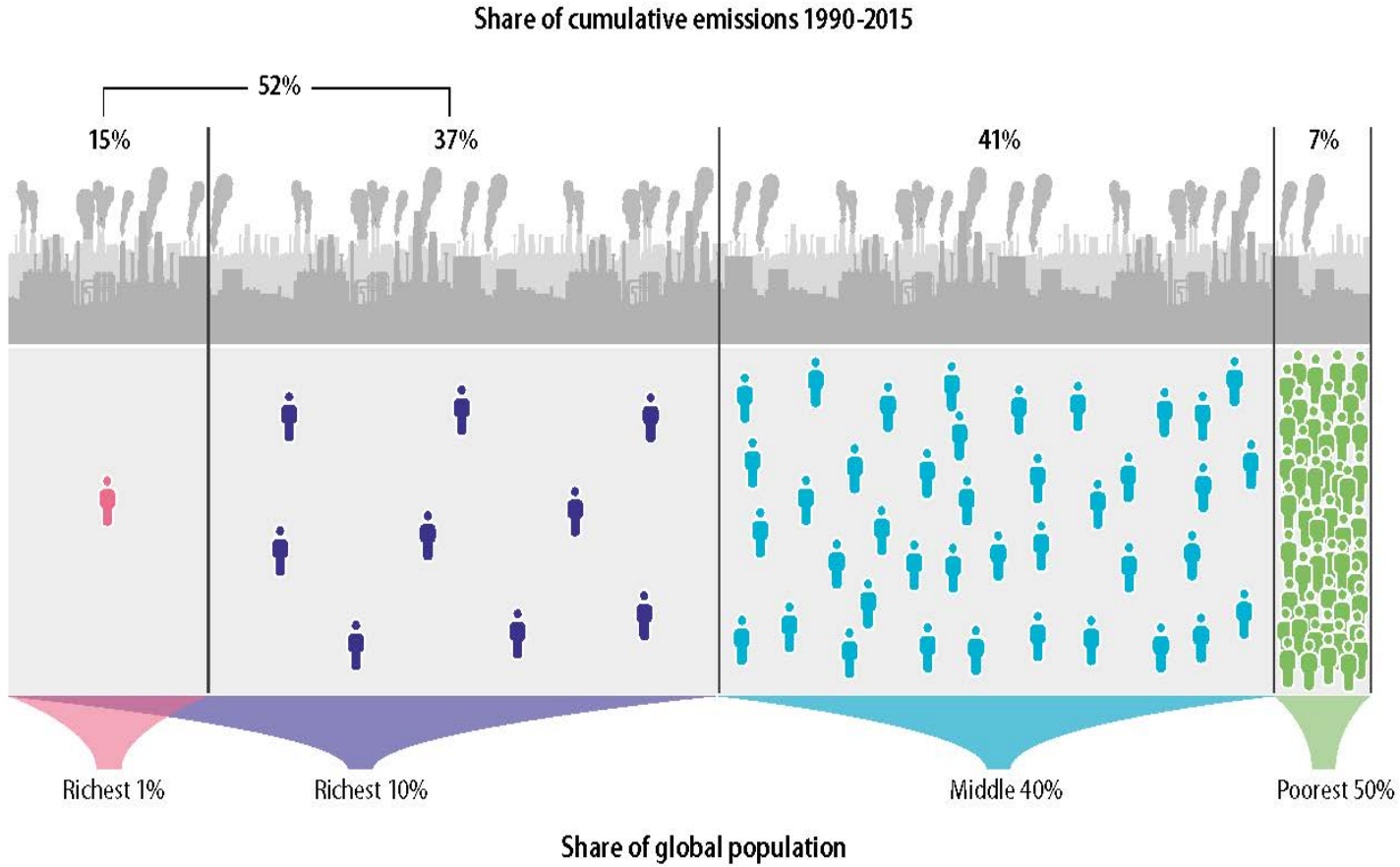


Figure 6. Share of the cumulative GHG emissions relative to the global population, in terms of wealth between 1990 and 2015. Adapted from the "Summary of headline findings from Oxfam and SEI's new research" figure in Gore, T. et al. (2020).[19]

10 Insights in Climate Science 2021

6. Supporting household behavior changes is a crucial but often overlooked opportunity for climate action

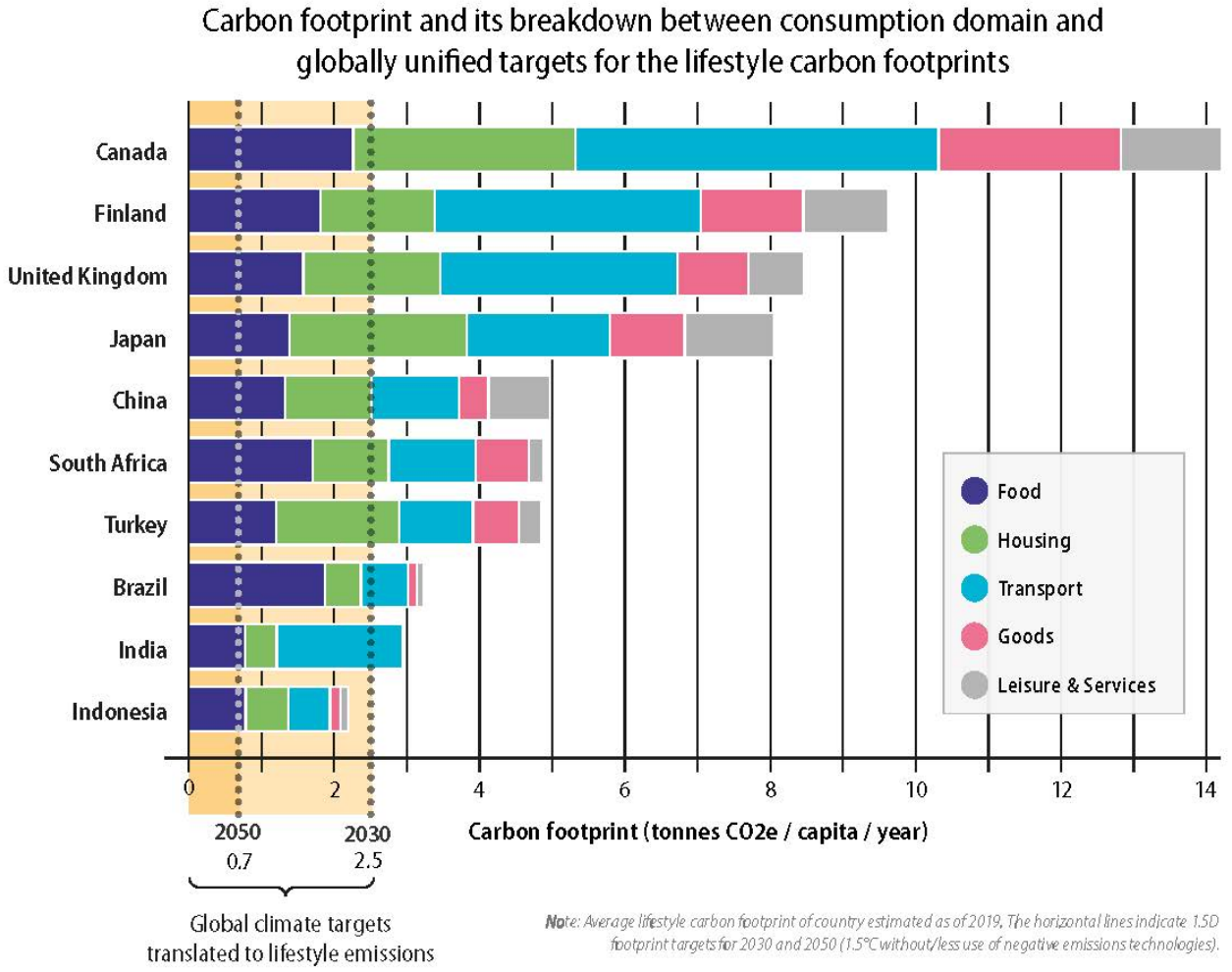


Figure 8. Current carbon footprints of different countries compared to global climate targets.[20]

10 Insights in Climate Science 2021

7. Political challenges impede effectiveness of carbon pricing

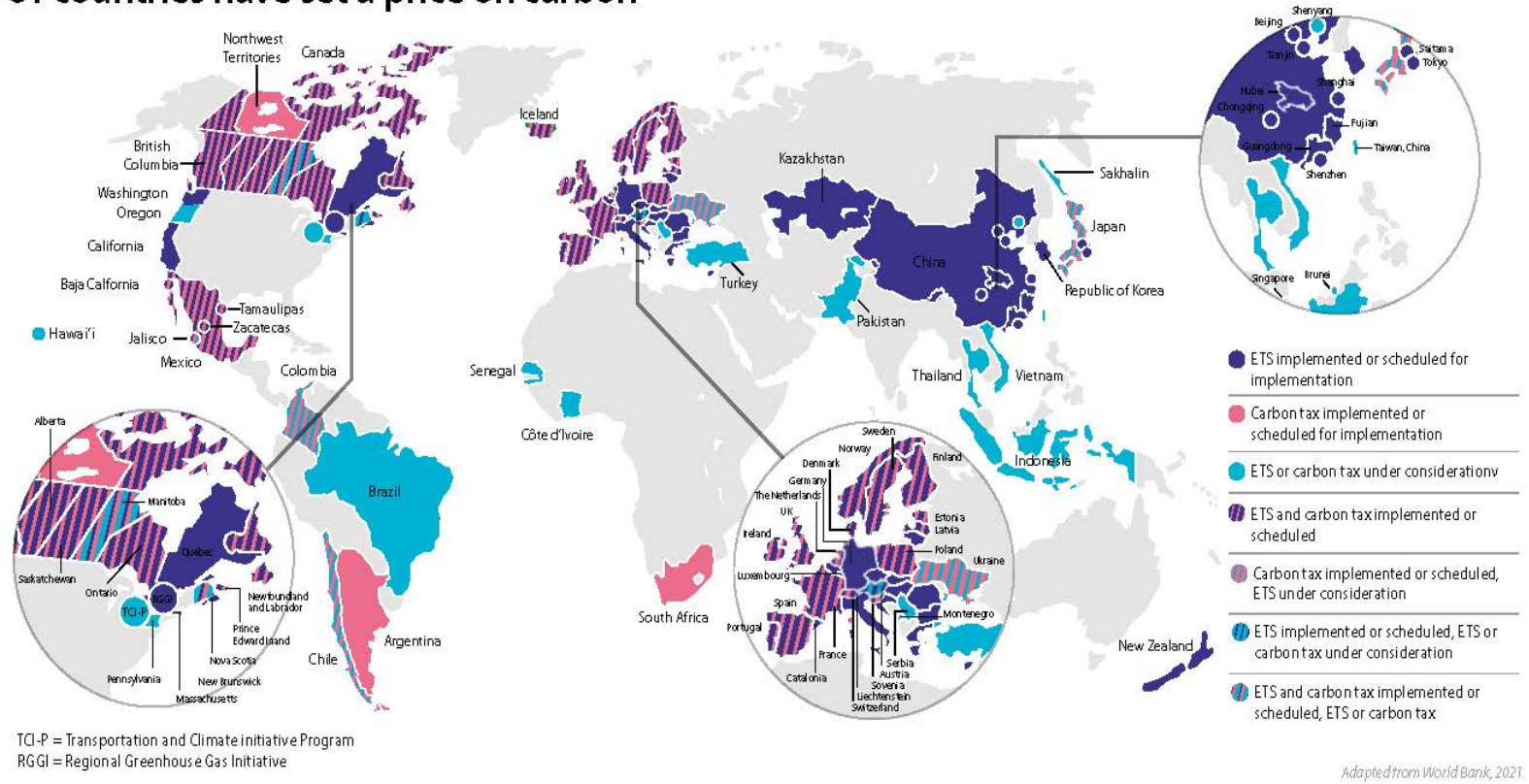


Figure 9. The map shows territories that have implemented or plan to implement a price on carbon, as a carbon tax, emissions trading scheme (ETS) or a combination of both.[22]

10 Insights in Climate Science 2021

8. Nature-based Solutions are critical for the pathway to Paris – but look at the fine print

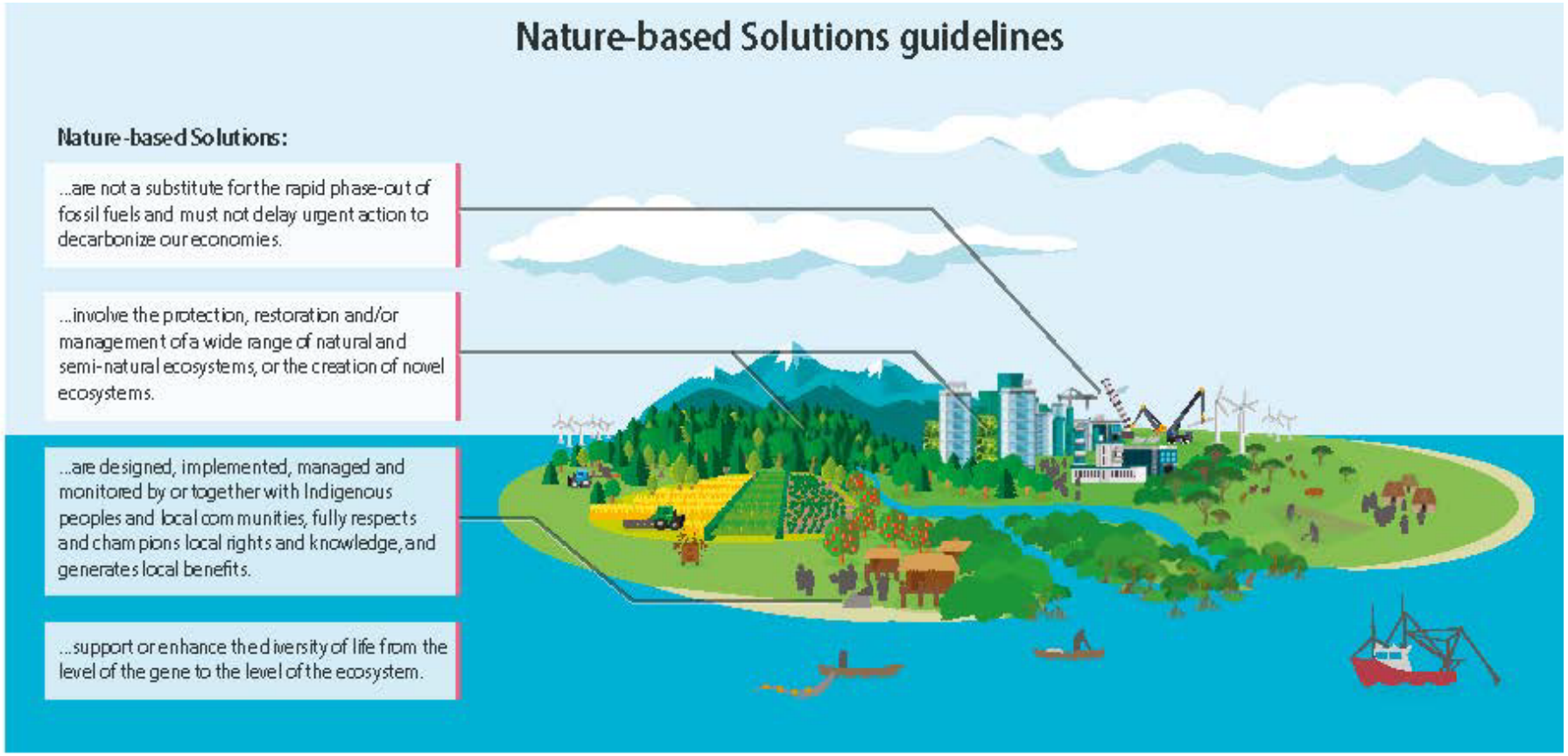


Figure 10. Four guidelines for Nature-based Solutions.[27]

10 Insights in Climate Science 2021

9. Building resilience of marine ecosystems is achievable by climate-adapted conservation and management, and global stewardship

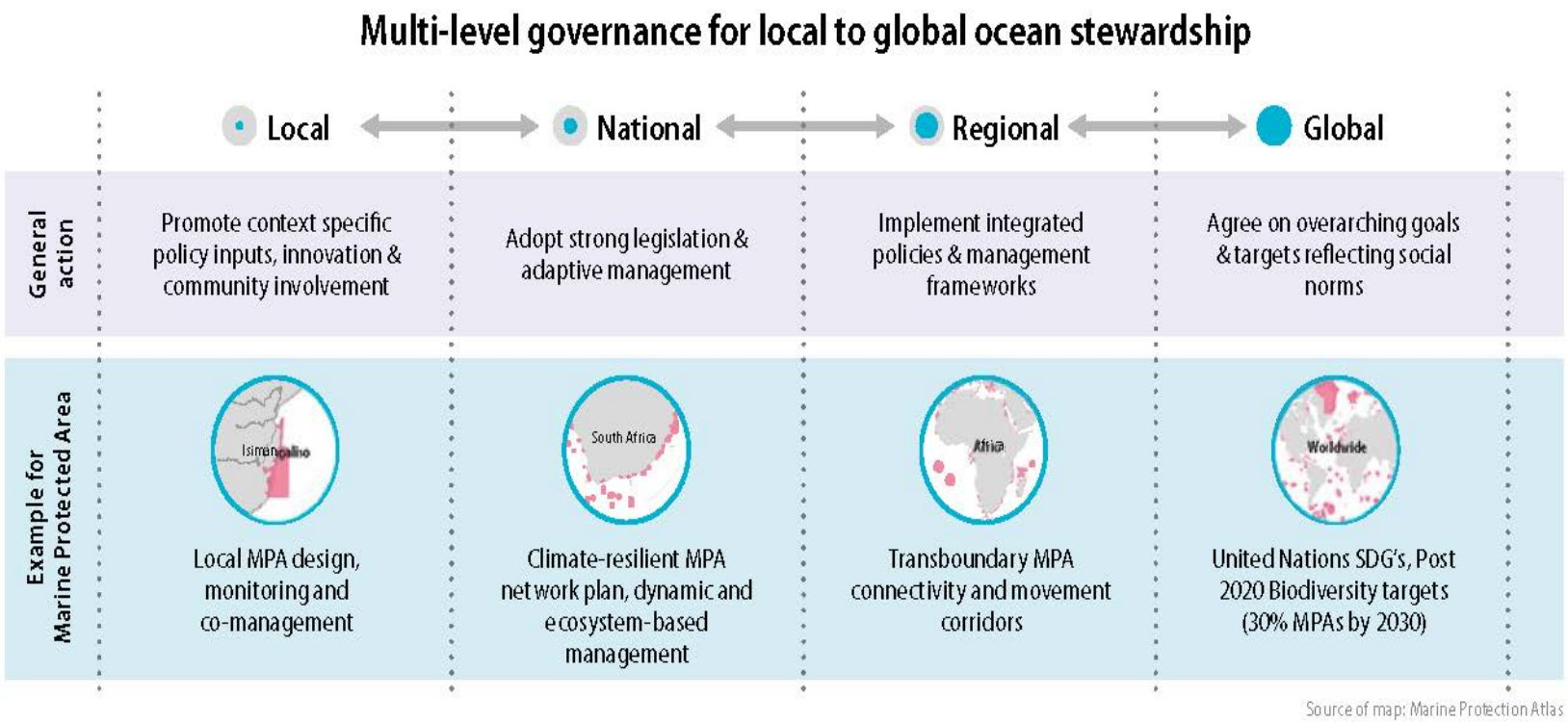
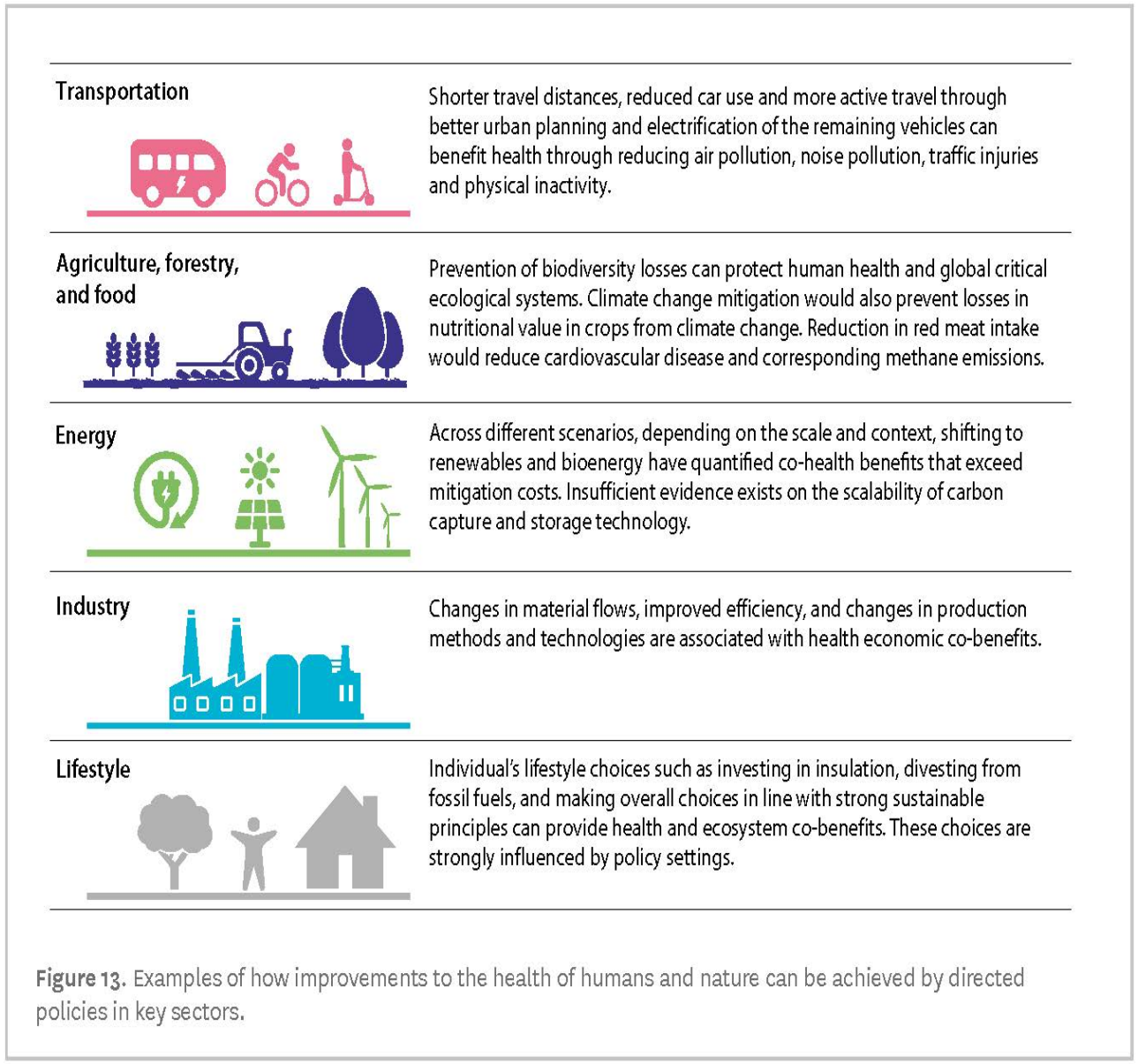


Figure 11. How ocean governance should work on different levels (local, national, regional and global) with examples of how this could work while implementing MPAs.

10 Insights in Climate Science 2021

10. Costs of climate change mitigation can be justified by the multiple immediate benefits to the health of humans and nature

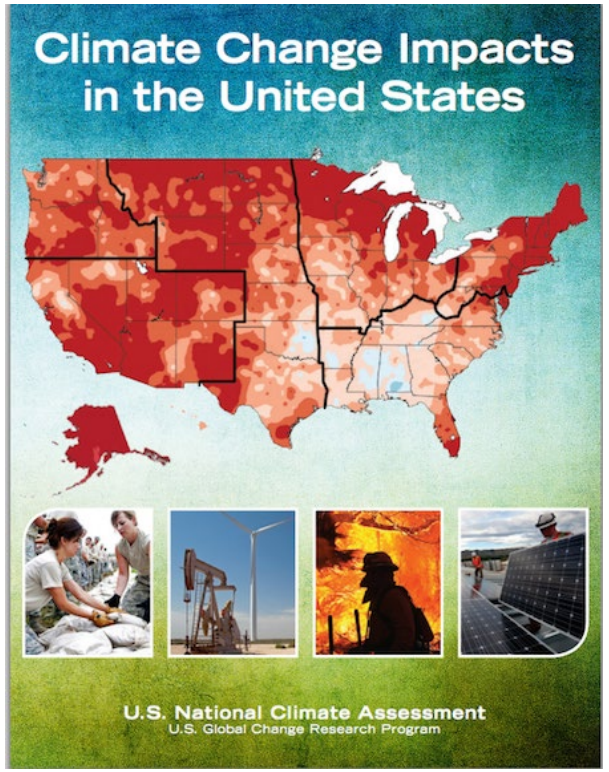


Transportation	Shorter travel distances, reduced car use and more active travel through better urban planning and electrification of the remaining vehicles can benefit health through reducing air pollution, noise pollution, traffic injuries and physical inactivity.
Agriculture, forestry, and food	Prevention of biodiversity losses can protect human health and global critical ecological systems. Climate change mitigation would also prevent losses in nutritional value in crops from climate change. Reduction in red meat intake would reduce cardiovascular disease and corresponding methane emissions.
Energy	Across different scenarios, depending on the scale and context, shifting to renewables and bioenergy have quantified co-health benefits that exceed mitigation costs. Insufficient evidence exists on the scalability of carbon capture and storage technology.
Industry	Changes in material flows, improved efficiency, and changes in production methods and technologies are associated with health economic co-benefits.
Lifestyle	Individual's lifestyle choices such as investing in insulation, divesting from fossil fuels, and making overall choices in line with strong sustainable principles can provide health and ecosystem co-benefits. These choices are strongly influenced by policy settings.

Figure 13. Examples of how improvements to the health of humans and nature can be achieved by directed policies in key sectors.

Federal-level Planning Activities

- The Fifth National Climate Assessment update (last issued in 2018 and updated every 4 years)
- National Fish and Wildlife Foundation (NFWF) National Coastal Resilience Fund (NCRF) Community Capacity Building and Planning grant



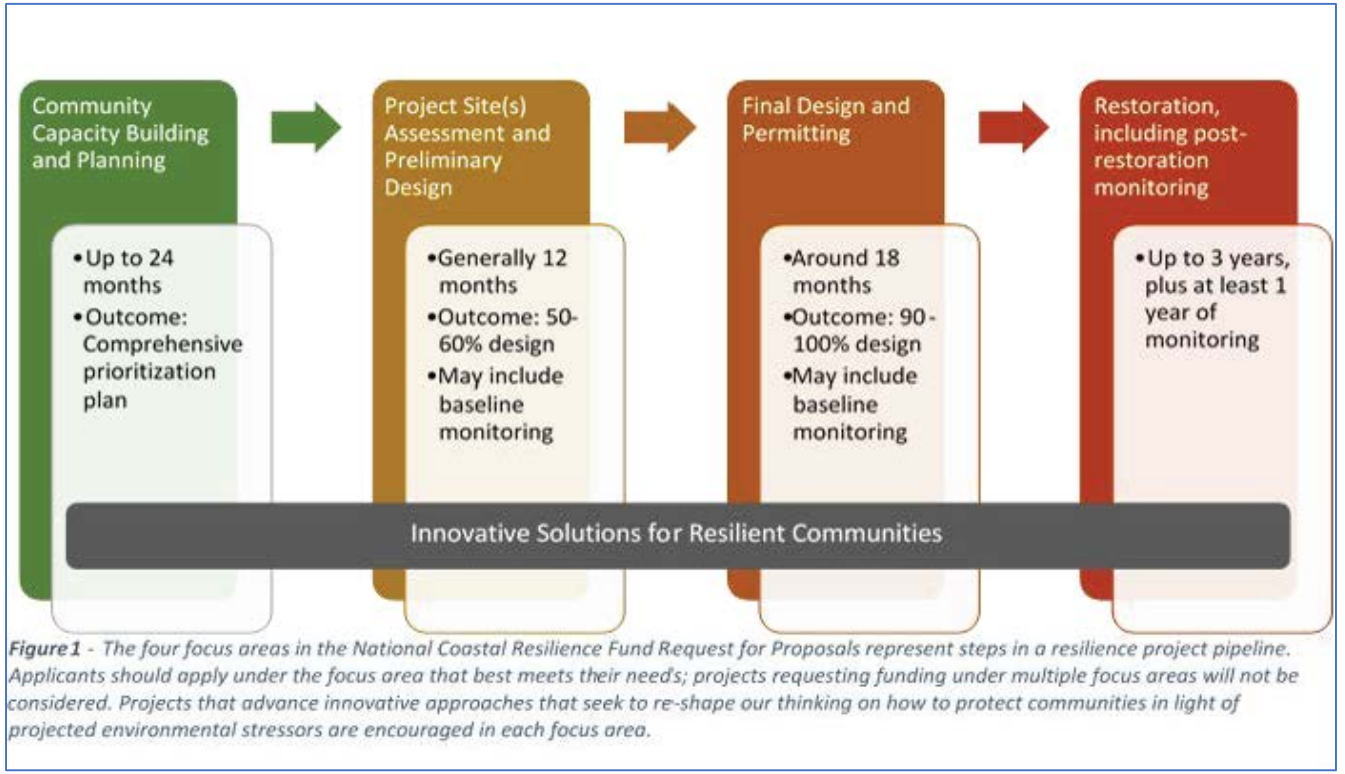
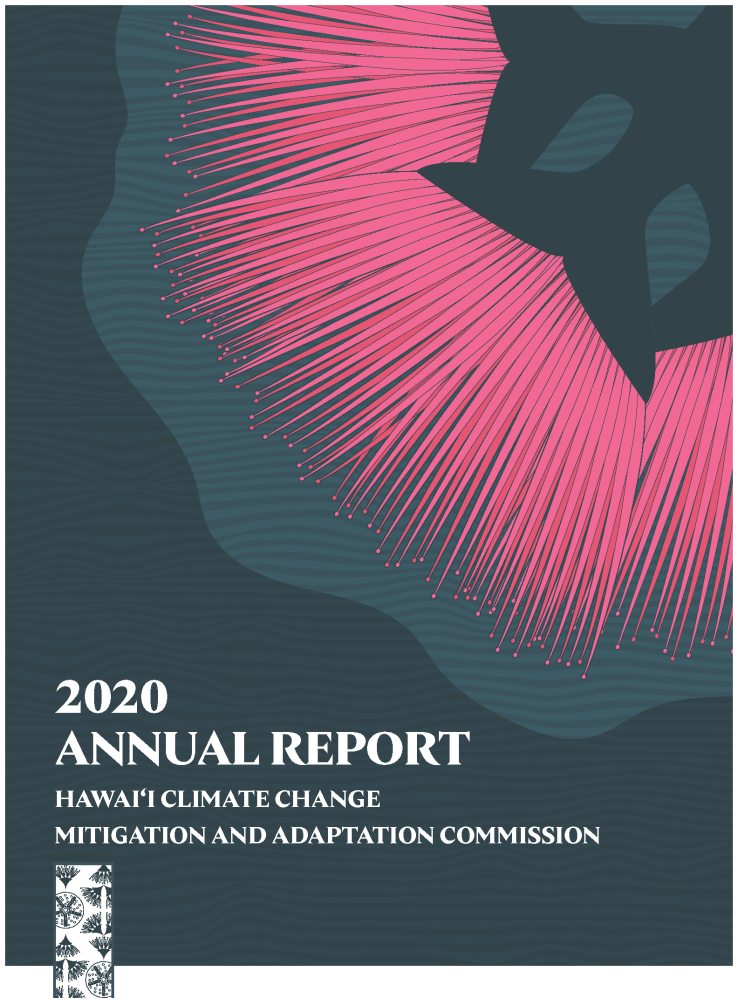
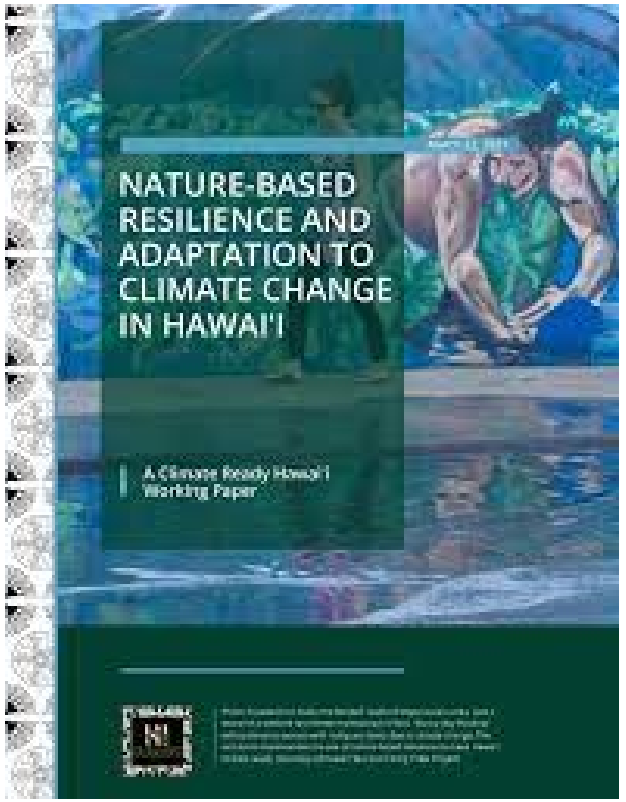
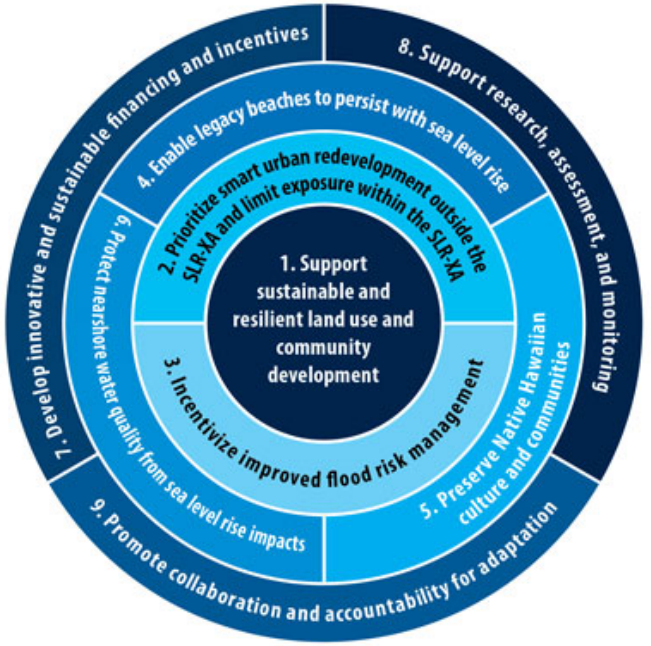


Figure 1 - The four focus areas in the National Coastal Resilience Fund Request for Proposals represent steps in a resilience project pipeline. Applicants should apply under the focus area that best meets their need's; projects requesting funding under multiple focus areas will not be considered. Projects that advance innovative approaches that seek to re-shape our thinking on how to protect communities in light of projected environmental stressors are encouraged in each focus area.

State-Level Initiatives

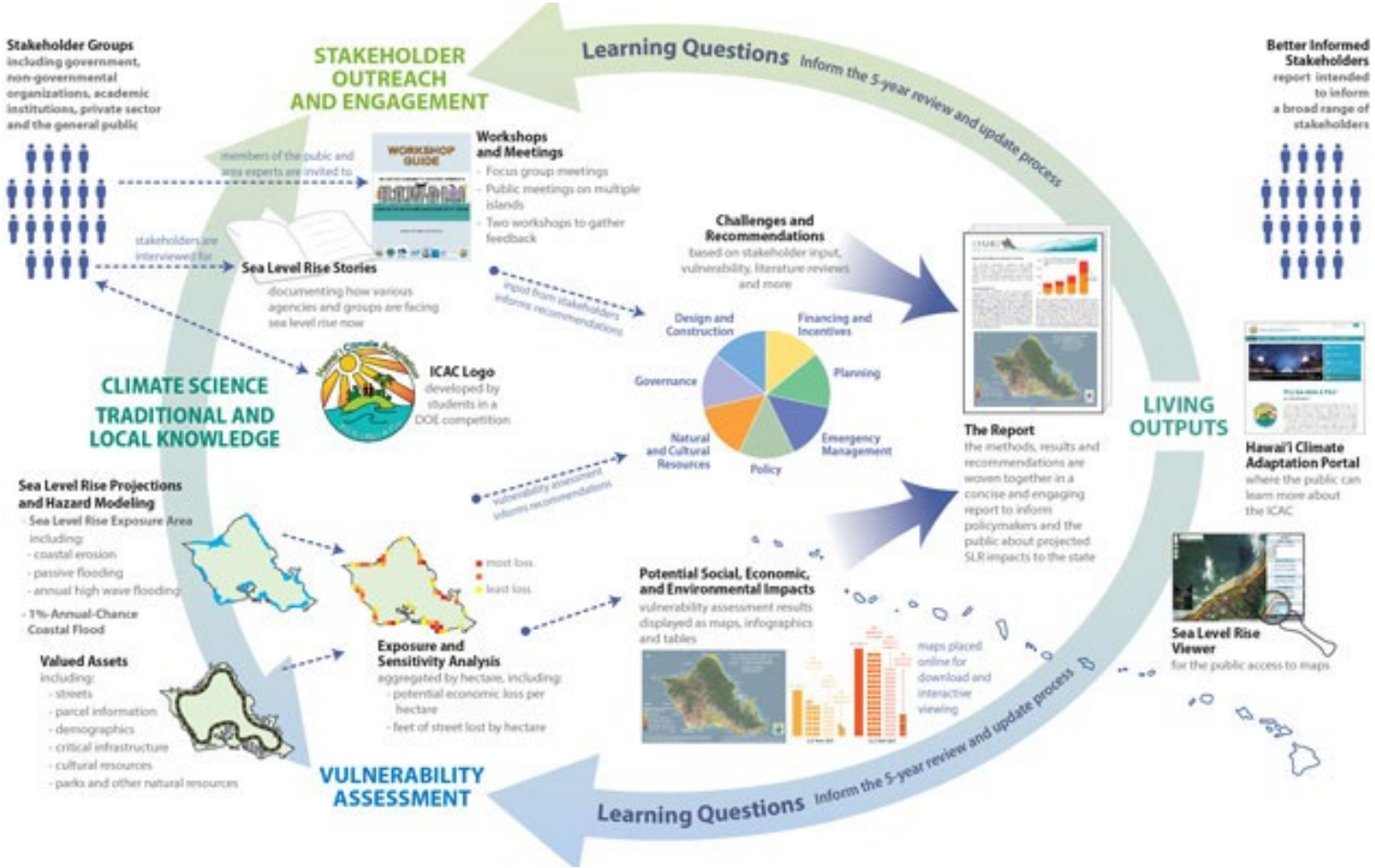






State-Level Initiatives

Climate Ready Hawai‘i and UH Social and Climate Vulnerability Framework



Next Steps

- Continue to **include climate change-related policies** in the General Plan update process, then implement via the Island Plan updates.
- Continue to work on a **more coordinated approach** to DHHL representation and involvement in disaster preparedness and community resilience planning processes, policies, and implementation activities at federal, state and county levels.
- **Schedule cross-training** on climate change and community resilience planning for the Planning Office, Land Management, and Land Development Division staff.
- Continue to include considerations of sea level rise, climate change and hazard vulnerability in the **criteria for evaluating land exchanges and acquisitions.**
- Conduct a **workshop for the Commission** in early 2022 to generate recommendations and direction on prioritization of DHHL efforts for – to include a summary of CC-related legislation in 2021 and proposed legislation for 2022.
- With grant approval, conduct **a Community Resilience and Capacity Building** planning process for Molokai's coastal homestead communities.

Nīnau?

Mahalo!

DEPARTMENT OF HAWAIIAN HOME LANDS

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