



# Wetlands as Nature-based Solutions for Climate and Sustainable Development

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# Nature-based solutions and climate action

# Nationally Determined Contributions

## Nationally Determined Contributions (NDCs)

- The Paris Agreement, agreed to at the UNFCCC COP21
- Requires all Parties of UNFCCC to identify and communicate their post-2020 climate actions, known as Nationally Determined Contributions (NDCs)
- NDCs present their contributions to climate change mitigation and adaptation
- Requires all Parties to report regularly on their emissions and their efforts to reduce emissions



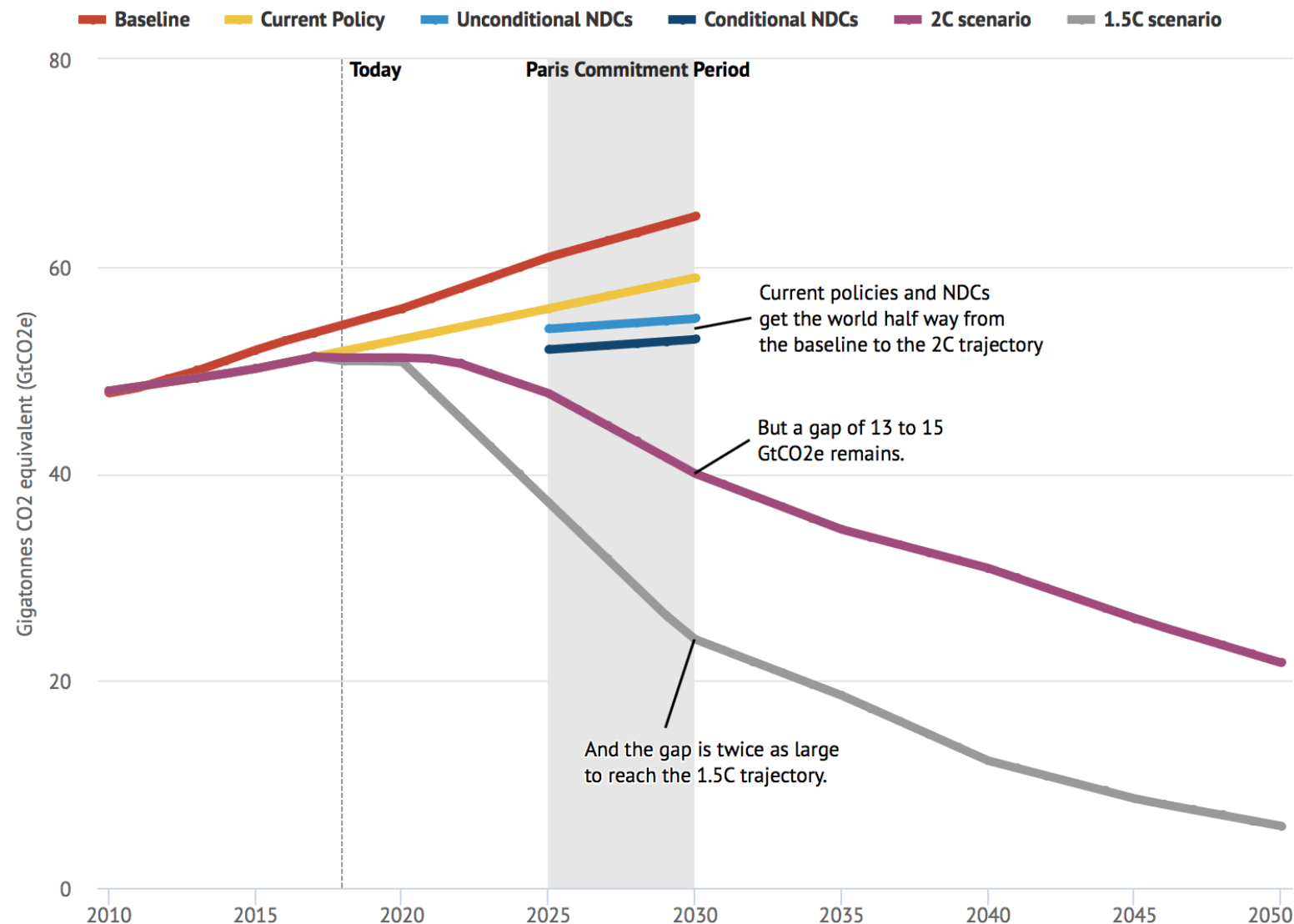
United Nations  
Climate Change

# Current NDCs and the Emissions Gap

Current NDC emission reductions **need to be tripled to limit warming to well below 2C**

Limiting warming to below **1.5C** would require existing commitments to be **“increased around fivefold”**

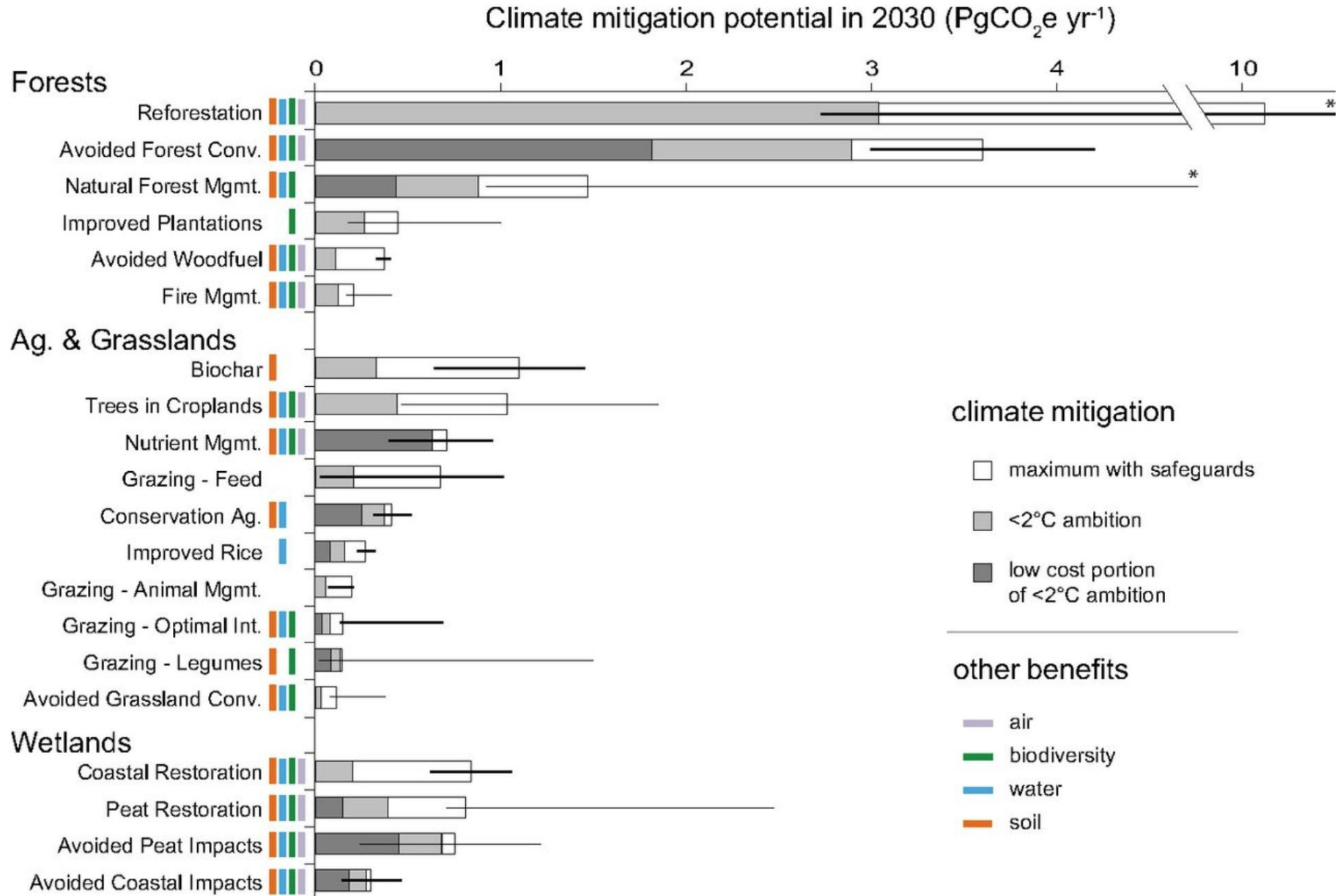
UNEP Emissions Gap Report 2018



# Leading nature-based climate solutions

Forests, peatlands, wetlands and agriculture can provide **>1/3** of our climate mitigation solution

Griscom et al. 2017. Natural Climate Solutions. PNAS.



## Nature-based solutions:

actions to **protect**, sustainably **manage** and/or **restore ecosystems**, while simultaneously contributing to the achievement of **multiple sustainable development goals**, including national goals for climate, food security, water security, disaster risk reduction and livelihoods, among others.



# Examples of nature-based solutions

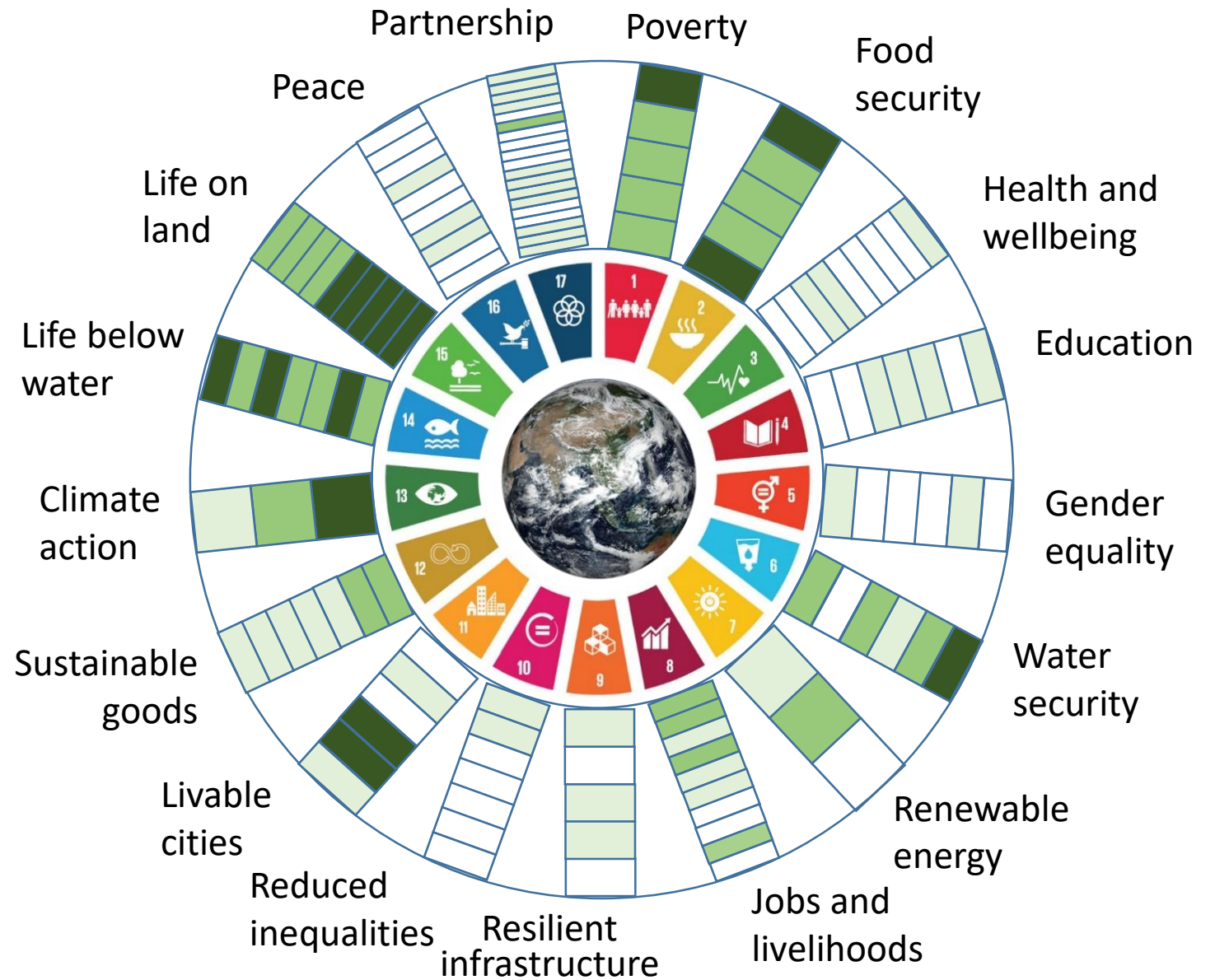
- Forest protection
- Avoided deforestation
- Mangrove restoration
- Regenerative agriculture
- Sea grass bed and coral restoration
- Sustainable forest management
- Sustainable grazing practices
- Peatland protection
- Wetland restoration
- Nature-based energy
- Agroforestry
- Reforestation



# Nature-based solutions and the SDGs

**Nature-based solutions** are indivisible with half of the SDG targets.

Nature-based solutions ensure that **no one is left behind**, and they are a safety net for the 3+ billion people who depend on nature for their livelihoods





# Wetlands as NBS

## Wetlands types

- Marine and Coastal Wetlands
- Inland Wetlands
- Human-made Wetlands

## Wetlands snapshot

- Wetlands worldwide: 748 and 778 million hectares
- Mangroves cover ~240,000 km<sup>2</sup>
- Remaining coral reefs cover ~600,000 km<sup>2</sup>

## Wetlands actions

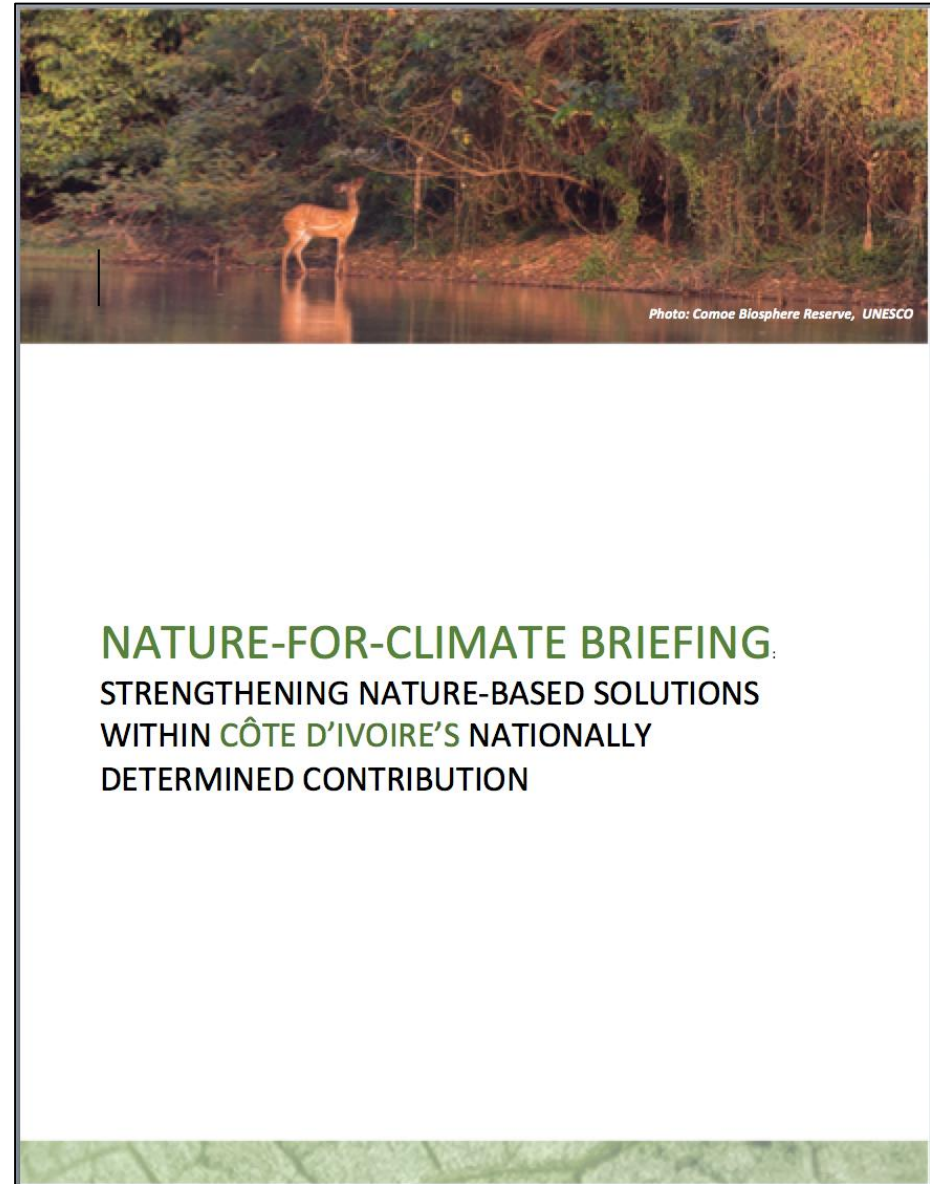
- Protect, manage, restore





# “Nature for Climate” Briefing - identifying opportunities for nature-based wetlands solutions within Nationally Determined Contributions

**Nature-for-climate briefing:**  
An analysis of how nature-based solutions can help achieve national climate goals while also contributing to national sustainable development goals.



# Analyzing nature-based solutions within Côte d'Ivoire

## Framework for analysis of nature-based solutions

	<b>PROTECT</b> , maintain and connect intact ecosystems and habitats	<b>MANAGE</b> ecosystems sustainably for multiple benefits	<b>RESTORE</b> degraded ecosystems, species and ecological processes
Potential, opportunities, actions and commitments related to <b>FOREST ECOSYSTEMS</b>			
Potential, opportunities, actions and commitments related to <b>WETLANDS AND PEATLANDS</b>			
Potential, opportunities, actions and commitments related to <b>COASTAL ECOSYSTEMS</b>			
Potential, opportunities, actions and commitments related to <b>GRASSLANDS AND AGRICULTURAL SYSTEMS</b>			

# Analyzing nature-based solutions within Côte d'Ivoire

## Mitigation potential of nature-based solutions:

- Protect inland wetlands
- Protect mangroves
- Wetland restoration

	<b>Protect</b> , maintain and connect intact ecosystems and habitats	<b>Manage</b> ecosystems sustainably for multiple benefits	<b>Restore</b> degraded ecosystems, species and ecological processes
Opportunities for mitigation through actions related to <b>FOREST ECOSYSTEMS</b>	❖ Avoided forest conversion: 34.92 Mt CO <sub>2</sub> e/yr	❖ Natural forest management: 6.43 Mt CO <sub>2</sub> e/yr ❖ Avoided woodfuel harvest: 0.88 Mt CO <sub>2</sub> e/yr	❖ Reforestation: 32.23 Mt CO <sub>2</sub> e/yr
Opportunities for mitigation through actions related to <b>WETLANDS</b>	❖ Avoided peat impacts: 0.47 Mt CO <sub>2</sub> e/yr	❖ Not assessed	❖ Peatland restoration: 0.42 Mt CO <sub>2</sub> e/yr
Opportunities for mitigation through actions related to <b>COASTAL ECOSYSTEMS</b>	❖ Avoided mangroves impacts: 0.05 Mt CO <sub>2</sub> e/yr	Not assessed	Not assessed
Opportunities for mitigation through actions related to <b>GRASSLANDS AND SUSTAINABLE AGRICULTURE</b>	❖ Not assessed	❖ Rice management: 0.48 Mt CO <sub>2</sub> e/yr ❖ Biochar: 0.18 Mt CO <sub>2</sub> e/yr ❖ Optimal grazing intensity: 0.16 Mt CO <sub>2</sub> e/yr ❖ Trees in agricultural land: 0.13 Mt CO <sub>2</sub> e/yr	❖ Not assessed

# Potential Climate Change Adaptation Benefits in Côte d'Ivoire

Opportunities for adaptation	<b>Protect</b> , maintain and connect intact ecosystems and habitats	<b>Manage</b> ecosystems sustainably for multiple benefits	<b>Restore</b> degraded ecosystems, species and ecological processes
<b>WETLANDS</b>	<b>Avoided inland wetland impacts:</b> <ul style="list-style-type: none"> <li>❖ Improved food and nutrition</li> <li>❖ Improved water security</li> <li>❖ Reduced flood damage</li> <li>❖ Decreased loss of wetland biodiversity</li> <li>❖ Increase opportunity for reproduction of threatened and endangered waterfowl, shellfish and mammals</li> <li>❖ Increase recreation and tourism opportunities</li> <li>❖ Job creation and employment</li> </ul>	<b>Improved wetland management:</b> <ul style="list-style-type: none"> <li>❖ Improved food and nutrition</li> <li>❖ Improved water security</li> <li>❖ Decreased wetland loss and degradation</li> <li>❖ Decreased loss of wetland biodiversity</li> <li>❖ Decreased loss of ecosystem services</li> <li>❖ Reduced flood damage</li> <li>❖ Improve equity and gender consideration in wetland resources management</li> </ul>	<b>Wetland restoration:</b> <ul style="list-style-type: none"> <li>❖ Improved food and nutrition</li> <li>❖ Improved water security</li> <li>❖ Reduced flood damage</li> <li>❖ Decreased loss of wetland biodiversity</li> <li>❖ Decreased loss of ecosystem services</li> <li>❖ Enhancement of carbon sinks and other wetland ecosystem services</li> <li>❖ Job creation and employment for youths and women</li> </ul>
<b>COASTAL ECOSYSTEMS</b>	<b>Marine protected areas and avoided mangrove and seagrass impacts:</b> <ul style="list-style-type: none"> <li>❖ Improved food and nutrition</li> <li>❖ Improved water security</li> <li>❖ Decreased loss of marine and coastal biodiversity</li> <li>❖ Decreased loss of ecosystem services</li> <li>❖ Reduced flood damage</li> <li>❖ Improved protection from storm surges and sea level rise</li> <li>❖ Reduced coastal erosion</li> </ul>	<b>Improved mangrove and seagrass management:</b> <ul style="list-style-type: none"> <li>❖ Improved food and nutrition</li> <li>❖ Improved water security</li> <li>❖ Decrease mangrove and seagrass loss and degradation</li> <li>❖ Decrease loss of marine and coastal biodiversity</li> <li>❖ Decrease loss of ecosystem services</li> <li>❖ Reduced poverty and improved jobs and livelihoods</li> <li>❖ Conserve and sustain important cultural, ecological and natural values of the coast</li> <li>❖ Reduced coastal erosion</li> <li>❖ Reduced flood damage</li> <li>❖ Protection from storm surges</li> </ul>	<b>Mangrove and seagrass restoration:</b> <ul style="list-style-type: none"> <li>❖ Improved food and nutrition</li> <li>❖ Improved water security</li> <li>❖ Reduced flood damage</li> <li>❖ Improved protection from storm surges</li> <li>❖ Resilience to the impacts of sea level rise, storms and strong winds</li> <li>❖ Reduced coastal erosion</li> <li>❖ Decreased loss of marine and coastal biodiversity</li> <li>❖ Decreased loss of ecosystem services</li> <li>❖ Job creation</li> </ul>

## Avoid inland wetland impacts:

- Maintain water quality
- Sustain tourism

## Improve wetlands management

- Improved water security
- Reduced flood damage

## Restore coastal wetlands

- Storm surge protection
- Improved food security

# Actual nature-based solutions within Côte d'Ivoire's NDC

	<b>PROTECT</b> , maintain and connect ecosystems and habitats	<b>MANAGE</b> ecosystems sustainably for multiple benefits	<b>RESTORE</b> degraded ecosystems, species and ecological processes
NDC commitments related to <b>WETLANDS</b>	❖ No references	❖ Develop the landscape approach for sustainable land management and water and soil conservation. ❖ Implement planning and coordination for national river basins (RBs) and strengthen planning and coordination for cross-border RBs. ❖ Promote sustainable land management through techniques to improve water and soil conservation (SWC). ❖ Adaptation: Implement the Integrated Management of Water Resources (IWRM)	❖ No references
NDC commitments related to <b>COASTAL ECOSYSTEMS</b>	❖ Protect the habitat (enforce regulations on the construction and extraction of sand on the coast, move and rebuild structures at risk on a fallback line, build active protection structures, breakwaters, passive, restoration, wind curtains, revegetation, reforestation, mangroves)	❖ No references	Coastal zones: Regulate the construction and extraction of sand on the coast, relocate and rebuild structures in danger on a fallback line, build active protection (groynes, breakwaters), passive, restoration (windbreaks) wind, revegetation, even reforestation – mangroves-).

## Protect wetlands:

- No mention

## Manage coastal wetlands

- No mention

## Restore wetlands

- No mention

## Other references

- Weak linkages to climate adaptation

# NBS within Côte d'Ivoire's national development commitments

- Institutional and regulatory frameworks
- Strengthening IWRM
- Research on coastal erosion

	<b>PROTECT</b> , maintain and connect intact ecosystems and habitats	<b>MANAGE</b> ecosystems sustainably for multiple benefits	<b>RESTORE</b> degraded ecosystems, species and ecological processes
Development commitments related to <b>WETLANDS</b>	❖ No references	<b>NDP</b> <ul style="list-style-type: none"> <li>❖ The institutional and regulatory framework for water and forests and the environment is strengthened</li> <li>❖ The populations are made aware of environmental and water protection and forests</li> <li>❖ Integrated management of water resources is strengthened</li> </ul>	❖ No references
Development commitments related to <b>COASTAL ECOSYSTEMS</b>	<b>NDP</b> <ul style="list-style-type: none"> <li>❖ The fight against coastal erosion and capacities adaptation and mitigation of the effects of climate change are strengthened</li> </ul>	<ul style="list-style-type: none"> <li>❖ <b>NDP</b></li> <li>❖ The Government will ensure the implementation of national research programs to combat coastal erosion</li> </ul>	❖ No references

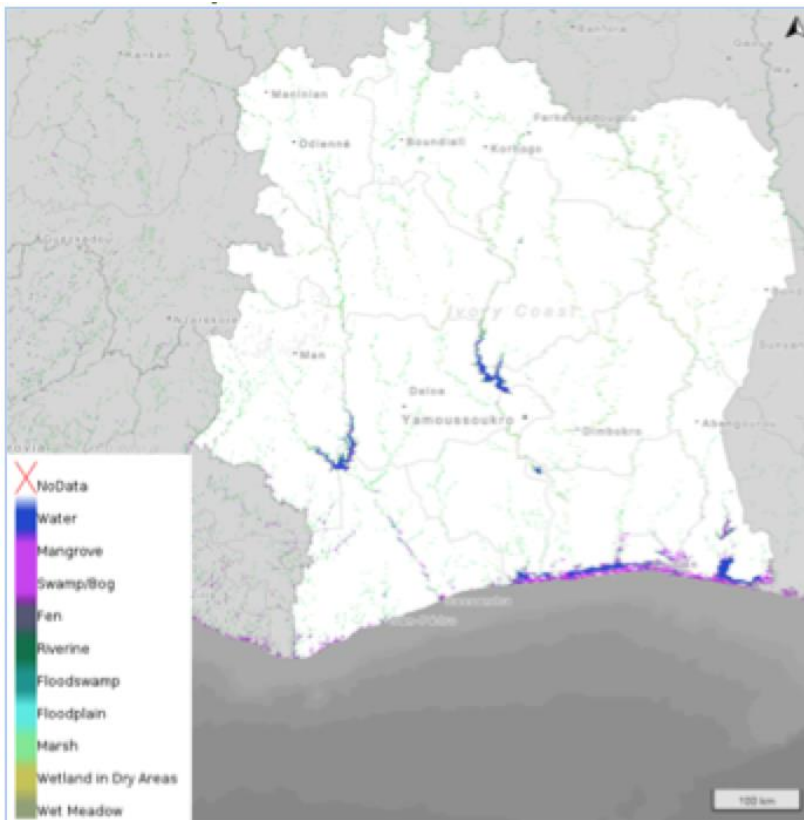


# NBS within Côte d'Ivoire's national environment commitments

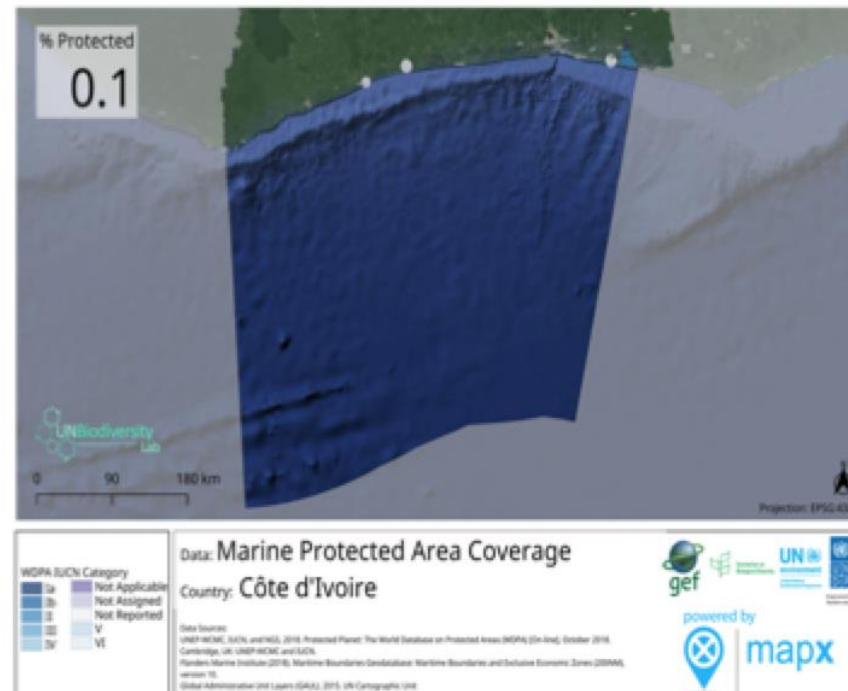
	<b>PROTECT</b> , maintain and connect intact ecosystems and habitats	<b>MANAGE</b> ecosystems sustainably for multiple benefits	<b>RESTORE</b> degraded ecosystems, species and ecological processes
Environmental commitments related to <b>WETLANDS</b>	<p><b>NBSAP</b></p> <ul style="list-style-type: none"> <li>❖ By 2020, 50% of inland, marine and coastal marine ecosystems are protected to ensure the conservation of biological diversity.</li> </ul>	<ul style="list-style-type: none"> <li>❖ <b>NBSAP</b></li> <li>❖ By 2020, the fishery resources are exploited taking into account the renewal of stocks.</li> </ul>	<ul style="list-style-type: none"> <li>❖ <b>NBSAP</b></li> <li>❖ By 2020 at the latest, priority ecosystems and habitats are restored</li> </ul>
Environmental commitments related to <b>COASTAL ECOSYSTEMS</b>	<p><b>NBSAP</b></p> <ul style="list-style-type: none"> <li>❖ By 2020, 50% of inland, marine and coastal marine ecosystems are protected to ensure the conservation of biological diversity.</li> <li>❖ Create a network of 4 marine protected areas</li> <li>❖ By 2020, 100% of ecosystems and habitats are represented within the network of viable protected areas</li> </ul> <p><b>PAP</b></p> <ul style="list-style-type: none"> <li>❖ Net Marine National Commitments: 0.07% cover if implemented</li> </ul>	<p><b>NBSAP</b></p> <ul style="list-style-type: none"> <li>❖ By 2020, the fishery resources are exploited taking into account the renewal of stocks.</li> </ul>	<p><b>NBSAP</b></p> <ul style="list-style-type: none"> <li>❖ By 2020 at the latest, priority ecosystems and habitats are restored</li> </ul>

# Opportunities for action on wetlands in Côte d'Ivoire

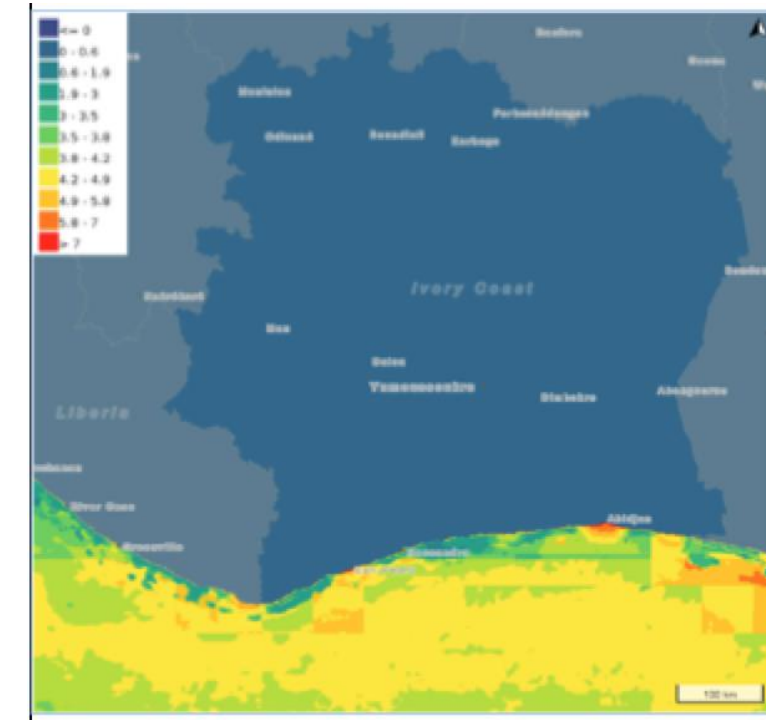
## Distribution of wetlands



## Marine Protected Areas



## Cumulative ocean impact



# Coastal Ecosystems in Samoa

Map 3: Cyclone risk<sup>17</sup>



Map 4: Tsunami<sup>18</sup>



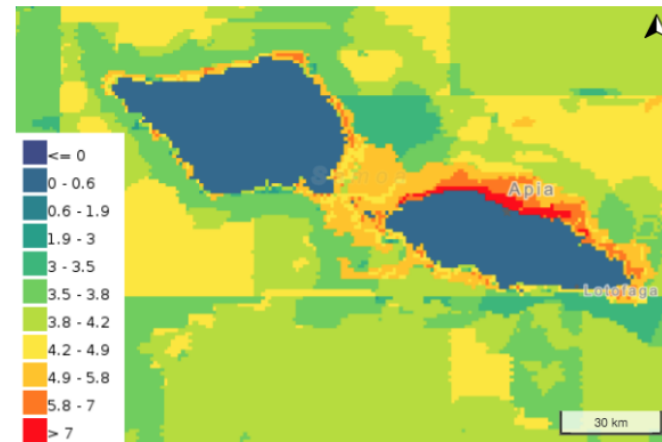
Map 5: Coastal flood risk<sup>19</sup>



Map 7: Seagrass bed coverage (2017)



Map 8: Cumulative ocean impact (2013)<sup>23</sup>



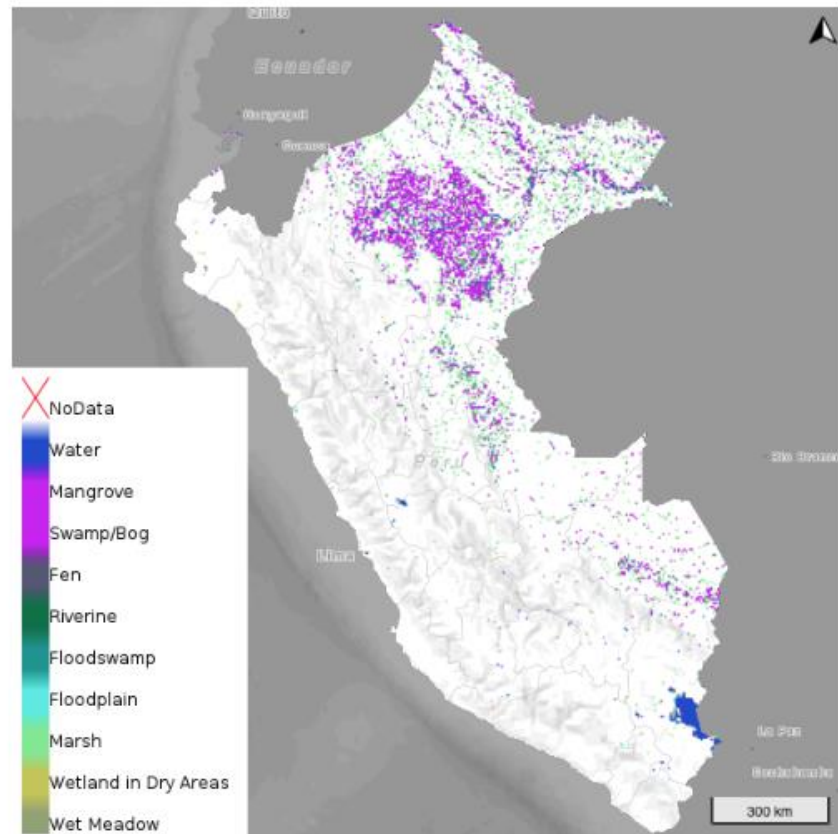
## Coastal Ecosystems

- **Disaster risk reduction:** essential buffers for storm surges, flooding
- **Local livelihoods & food security:** 25% of households engaged in fishing, 66% for home consumption

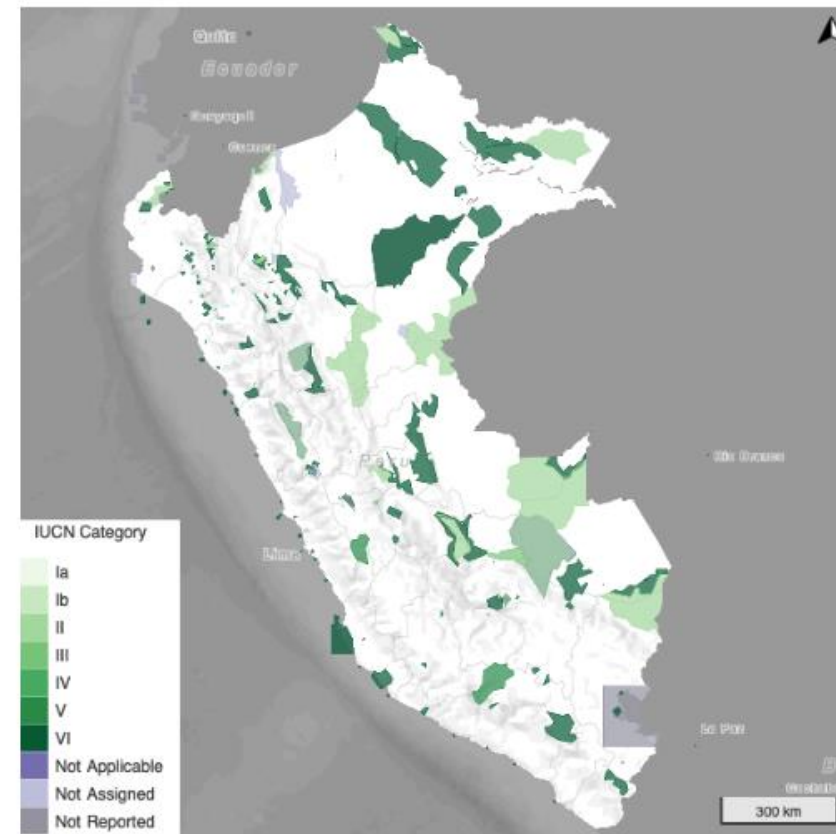
# Peatlands in Peru

- Peatlands in the Peruvian Amazon store **10x** the carbon as undisturbed rainforest
- The Pastaza-Marañón Foreland basin contains the largest peat swamp in the Amazon

Map 11: Global wetlands (CIFOR)



Map 12: Protected areas



# Scaling up wetland case studies and initiatives Côte d'Ivoire

## Participatory management of the Fresno mangrove forests



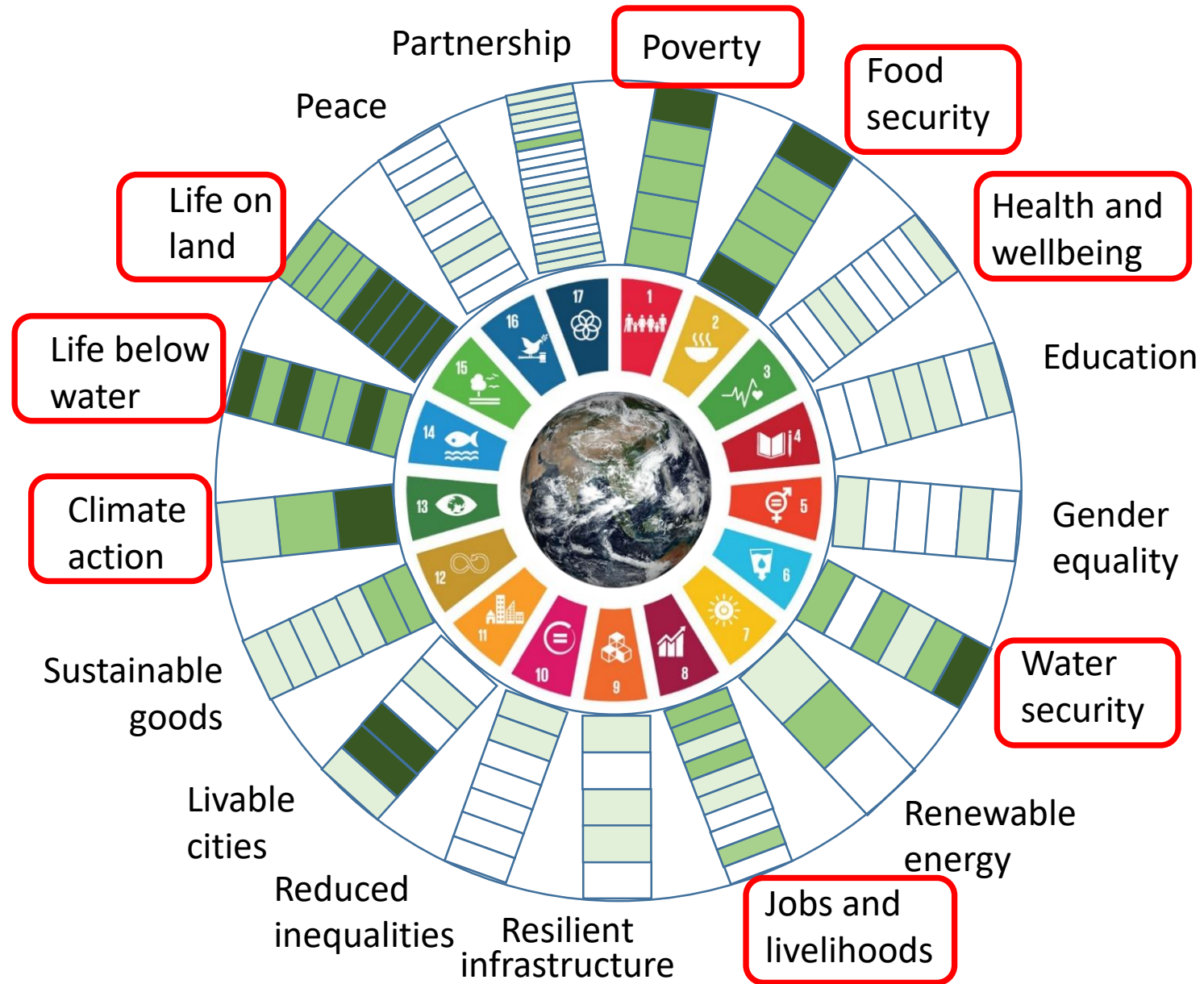
## Sea turtle conservation in Mani-Kablaké beach





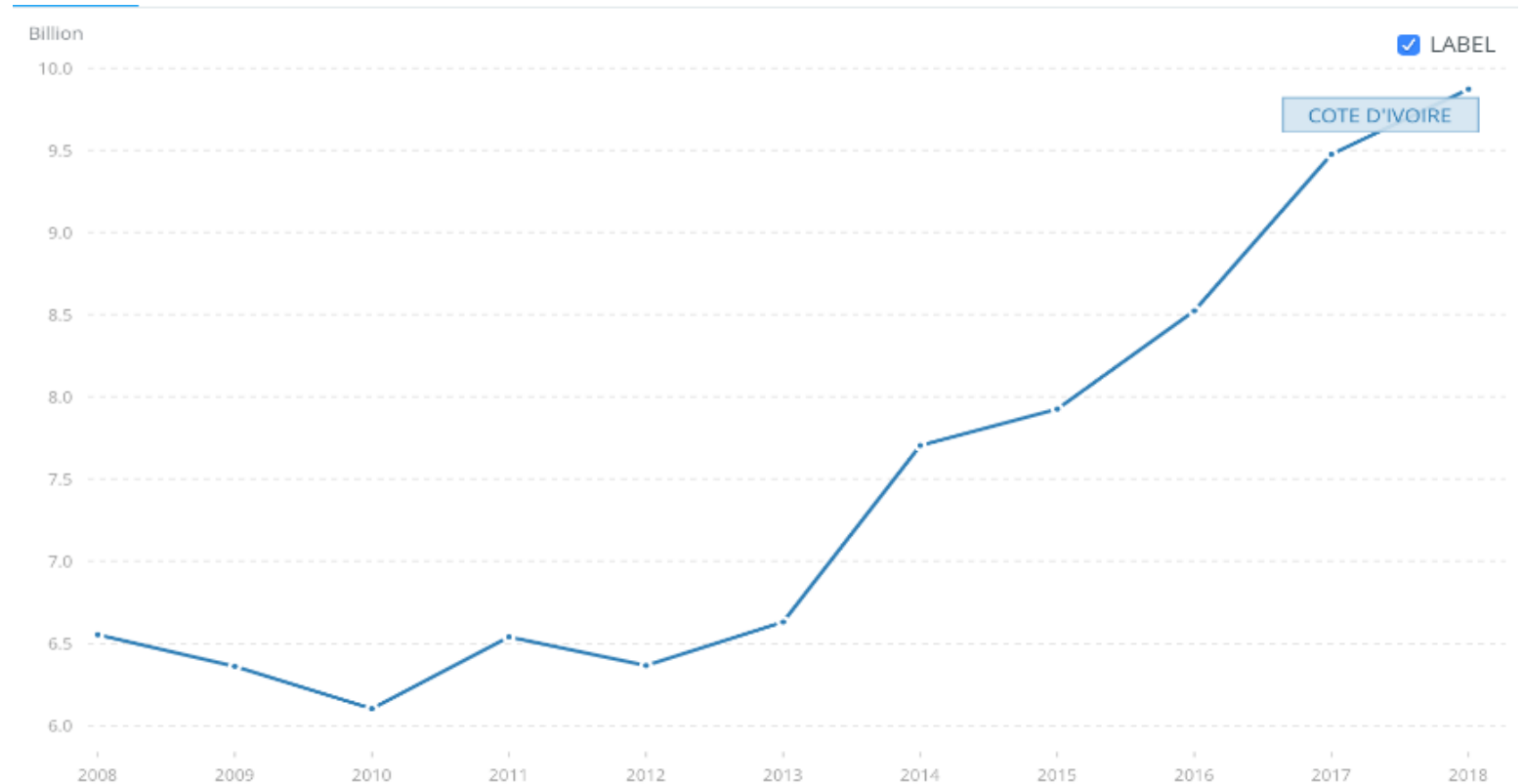
# Co-benefits of wetland protection, restoration and sustainable management

# Wetlands and the SDGs



## Benefits of nature-based solutions to Côte d'Ivoire:

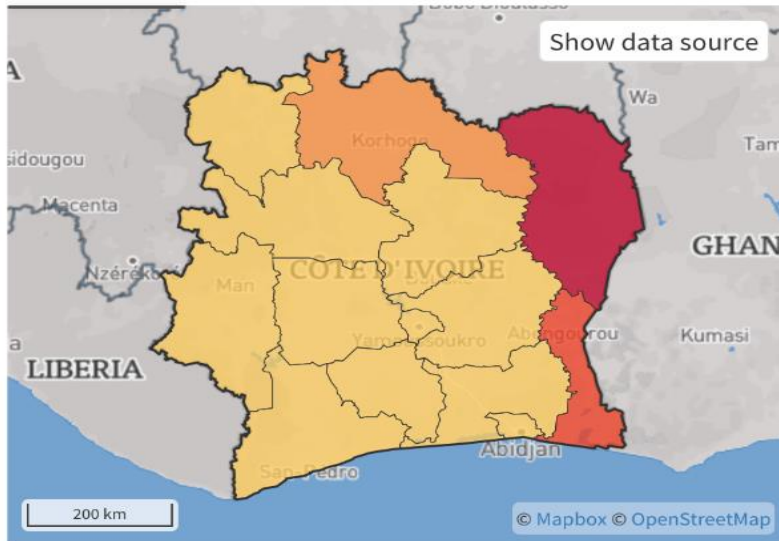
- Value of nature-based livelihoods to **Côte d'Ivoire's** GDP is \$9.8 billion



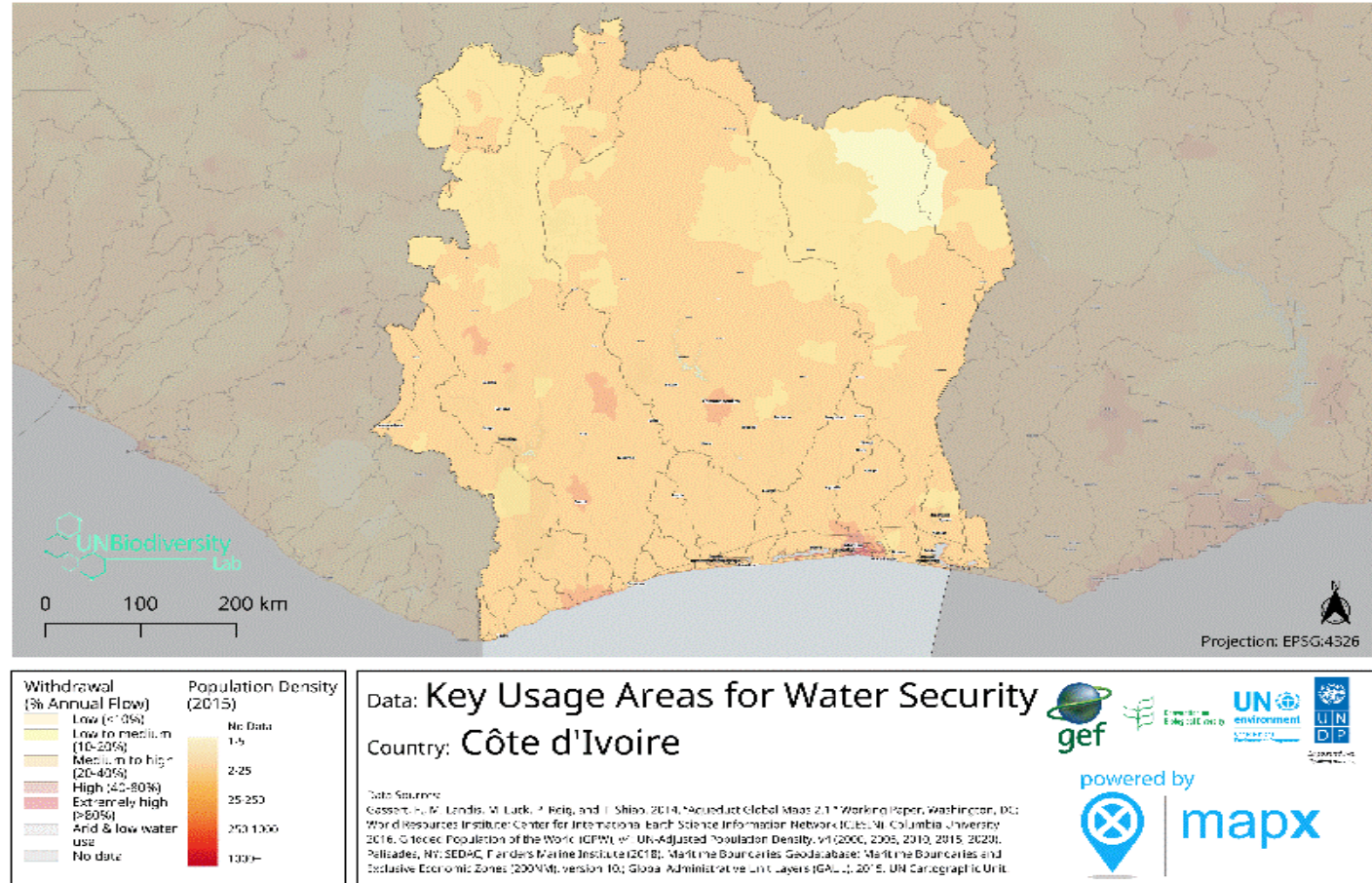


# Water Security

## Benefits of nature-based solutions to Côte d'Ivoire: Water security

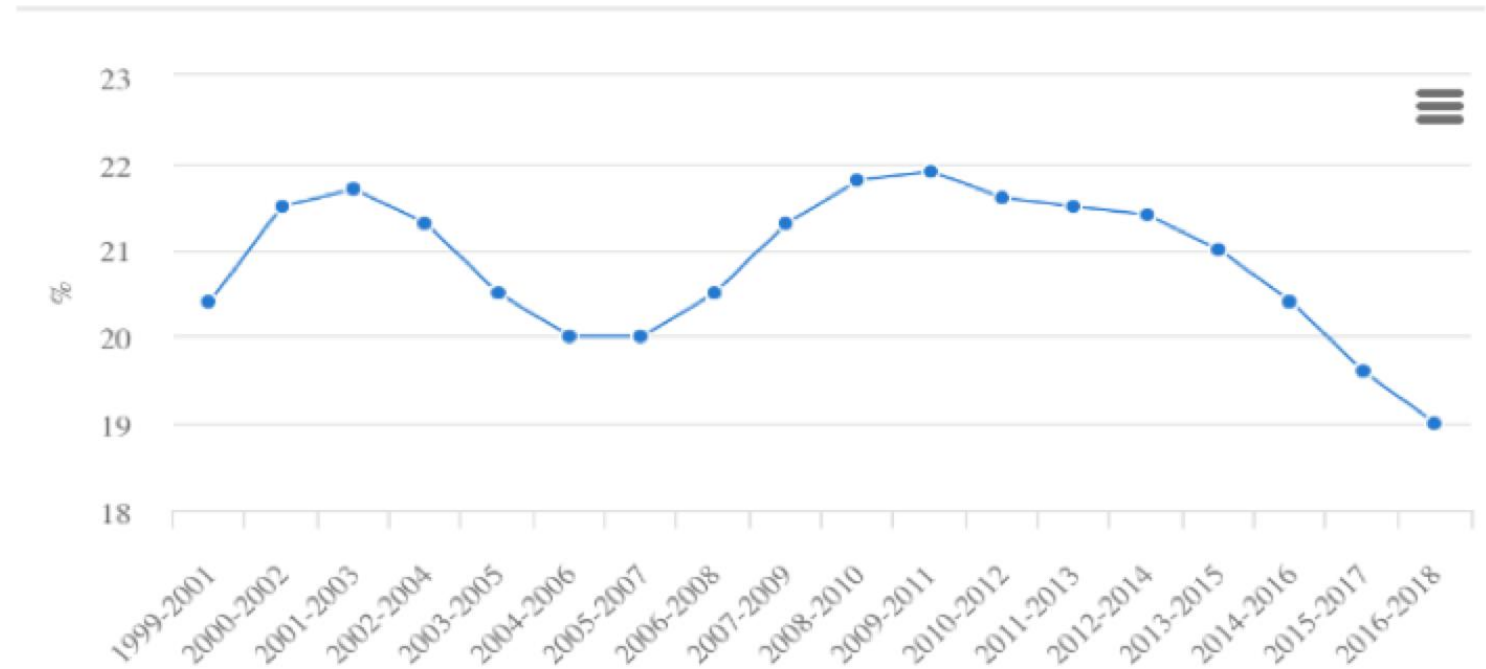


### Water scarcity in the Côte d'Ivoire



## Benefits of nature-based solutions to Côte d'Ivoire: Food security

- Mangroves provide essential nursery habitats and strengthens sustainable fish stocks



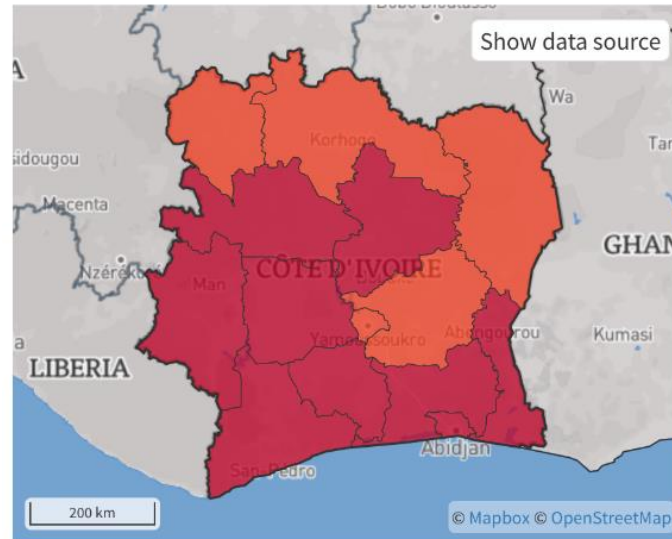
*Figure 2: 3-year average number of people undernourished in millions*

# Disaster Risk Reduction

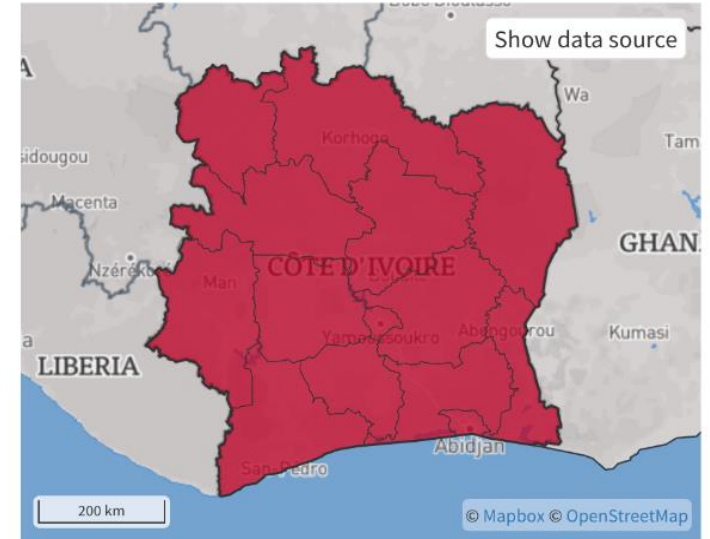
## Benefits of nature-based solutions to Côte d'Ivoire: Disaster Risk Reduction

- Côte d'Ivoire's natural disaster risk is considerable
- Wetlands and mangroves can reduce flooding by absorbing excess water into the soil

River flood hazard



Wildfire hazard



# Summary recommendations for nature-based solutions in Côte d'Ivoire

	<b>PROTECT</b> , maintain and connect intact ecosystems and habitats	<b>MANAGE</b> ecosystems sustainably for multiple benefits	<b>RESTORE</b> degraded ecosystems, species and ecological processes
Potential, opportunities, actions and commitments related to <b>FOREST ECOSYSTEMS</b>	Avoided forest conversion	Improve natural forest management Avoid fuelwood harvest	Forest restoration
Potential, opportunities, actions and commitments related to <b>WETLANDS AND PEATLANDS</b>	Protect wetlands		Restore wetlands
Potential, opportunities, actions and commitments related to <b>COASTAL ECOSYSTEMS</b>	Protect mangroves		Restore mangroves
Potential, opportunities, actions and commitments related to <b>GRASSLANDS AND AGRICULTURAL SYSTEMS</b>	Agroforestry	Rice management Biochar sequestration	



# Wetlands review – current status

# Enhancing NBS in the NDCs

55 Countries  
Identified for  
NBS in NDC Briefs



## Wetland Countries (**Wetland Priorities**)

1. **Argentina**
2. Bhutan
3. Cambodia
4. **Cote d'Ivoire**
5. **Colombia**
6. Cooks Island
7. Costa Rica
8. **DRC**
9. Dominica
10. **Dominican Republic**
11. **Ecuador**
12. **Honduras**
13. **Indonesia**
14. Kyrgyz Republic
15. Mauritius
16. **Mexico**
17. Myanmar
18. Nepal
19. **Nigeria**
20. Niue
21. **Panama**
22. **Papua New Guinea**
23. Peru
24. **Philippines**
25. St Vincent & Grenadines
26. Samoa
27. Seychelles
28. Somalia
29. South Sudan
30. **Thailand**
31. **Uganda**
32. **Vietnam**

# Next steps for Wetlands in Nationally Determined Contributions





# Building relevance: Placing wetlands and nature- based solutions at the heart of sustainable development



# Lesson 1: Spatial data is powerful



ABOUT

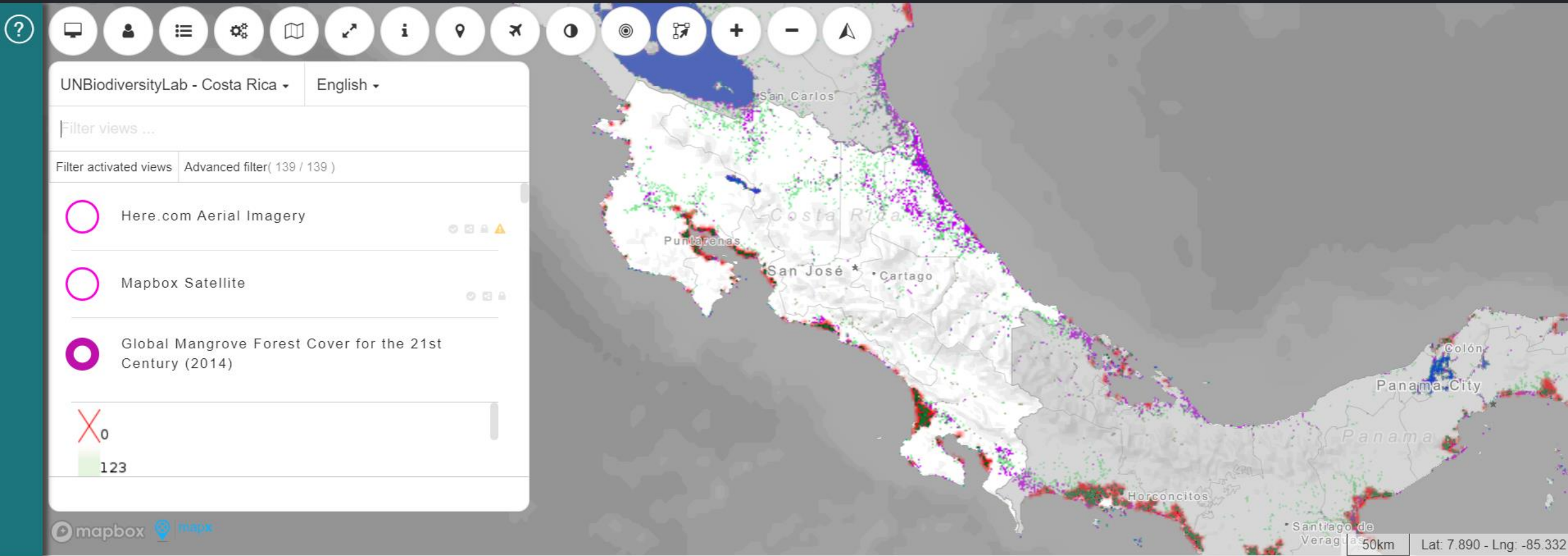
DATA

STORIES

USER GUIDE

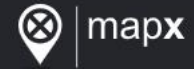
SUPPORT

MY PROJECTS

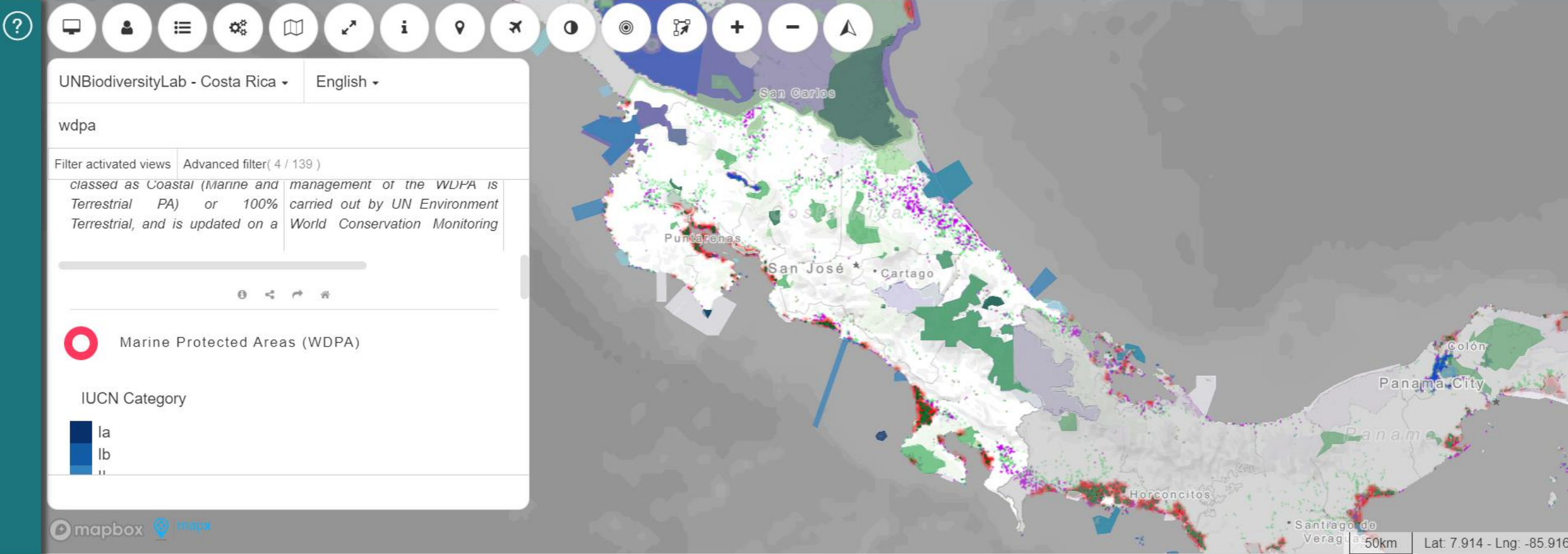


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# Lesson 2: It's the insight between data layers that matter!



# Lesson 3: It's the essential service, not the ecosystem

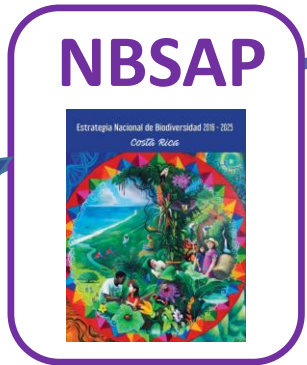


# Lesson 4: We need to map “Essential Life Support Areas”



# Lesson 5: We need to reframe how we think about wetlands and NBS

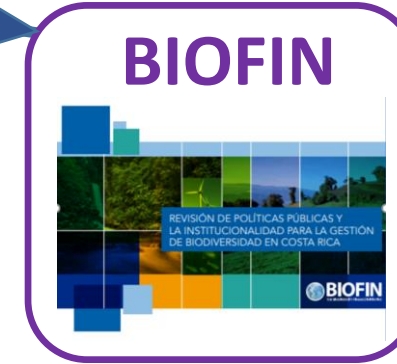
Set aspiration, goals for nature



Data and insight on nature



Refined aspiration, with finance and spatial plan for NBSAP



Better monitoring, reporting

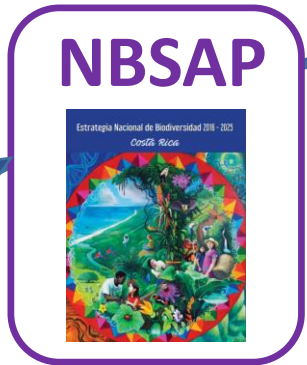


Better operational planning, finance and execution for NBSAP actions

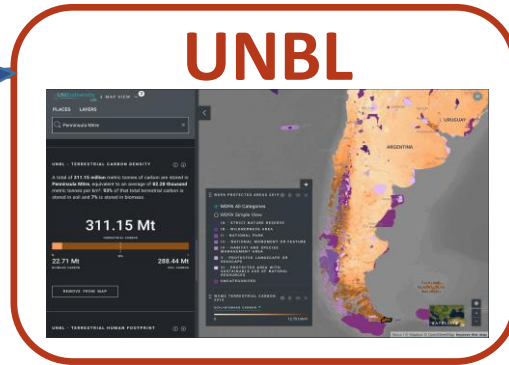


# Lesson 5: We need to reframe how we think about wetlands and NBS

Set aspiration, goals for nature



Data and insight on nature



Refined aspiration, with finance and spatial plan for NBSAP



Better monitoring, reporting



Better operational planning, finance and execution for NBSAP actions

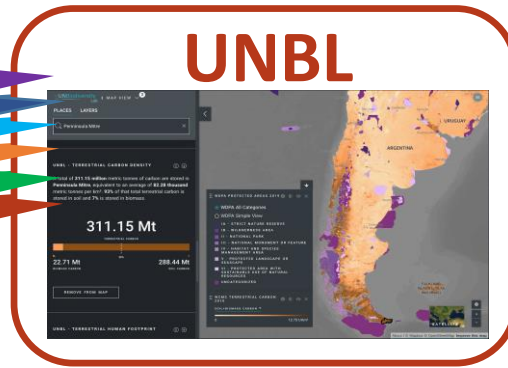


# Lesson 5: We need to reframe how we think about wetlands and NBS

Set aspiration, goals for nature AND nature-dependent development

Data and insight on nature AND development

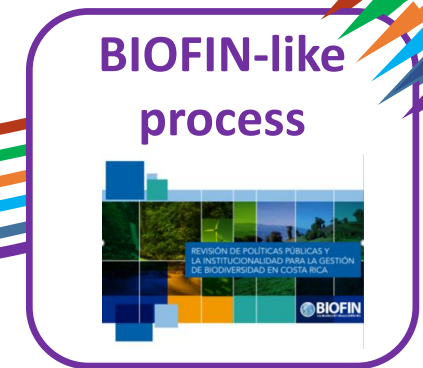
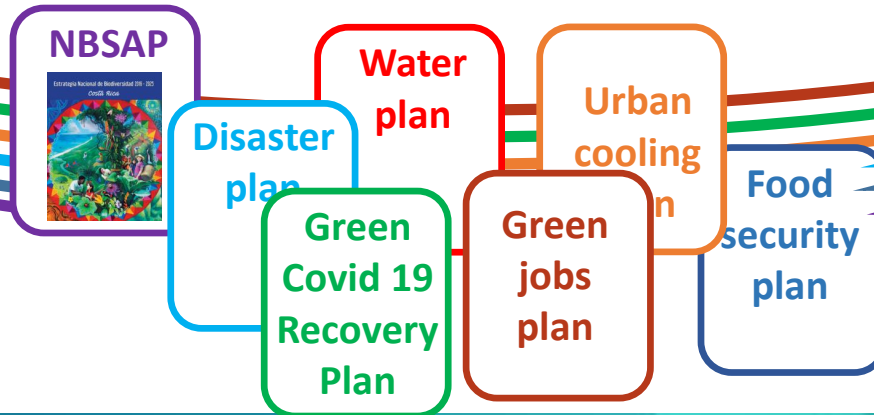
Integrated, optimized solutions for nature-dependent development plans



Better operational planning, finance and execution of nature-dependent development plans

Sectoral monitoring and reporting

Better sectoral monitoring, reporting



Q Penninsula Mitre X

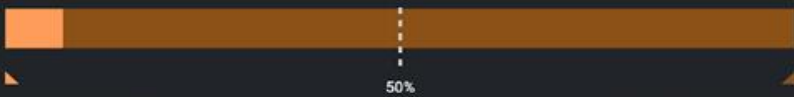
UNBL - TERRESTRIAL CARBON DENSITY



A total of **311.15 million** metric tonnes of carbon are stored in **Penninsula Mitre**, equivalent to an average of **82.28 thousand** metric tonnes per km<sup>2</sup>. **93%** of that total terrestrial carbon is stored in soil and **7%** is stored in biomass.

311.15 Mt

TERRESTRIAL CARBON



22.71 Mt

BIOMASS CARBON

288.44 Mt

SOIL CARBON

# Analytics

UNBL - TERRESTRIAL HUMAN FOOTPRINT



WDPA PROTECTED AREAS 2019

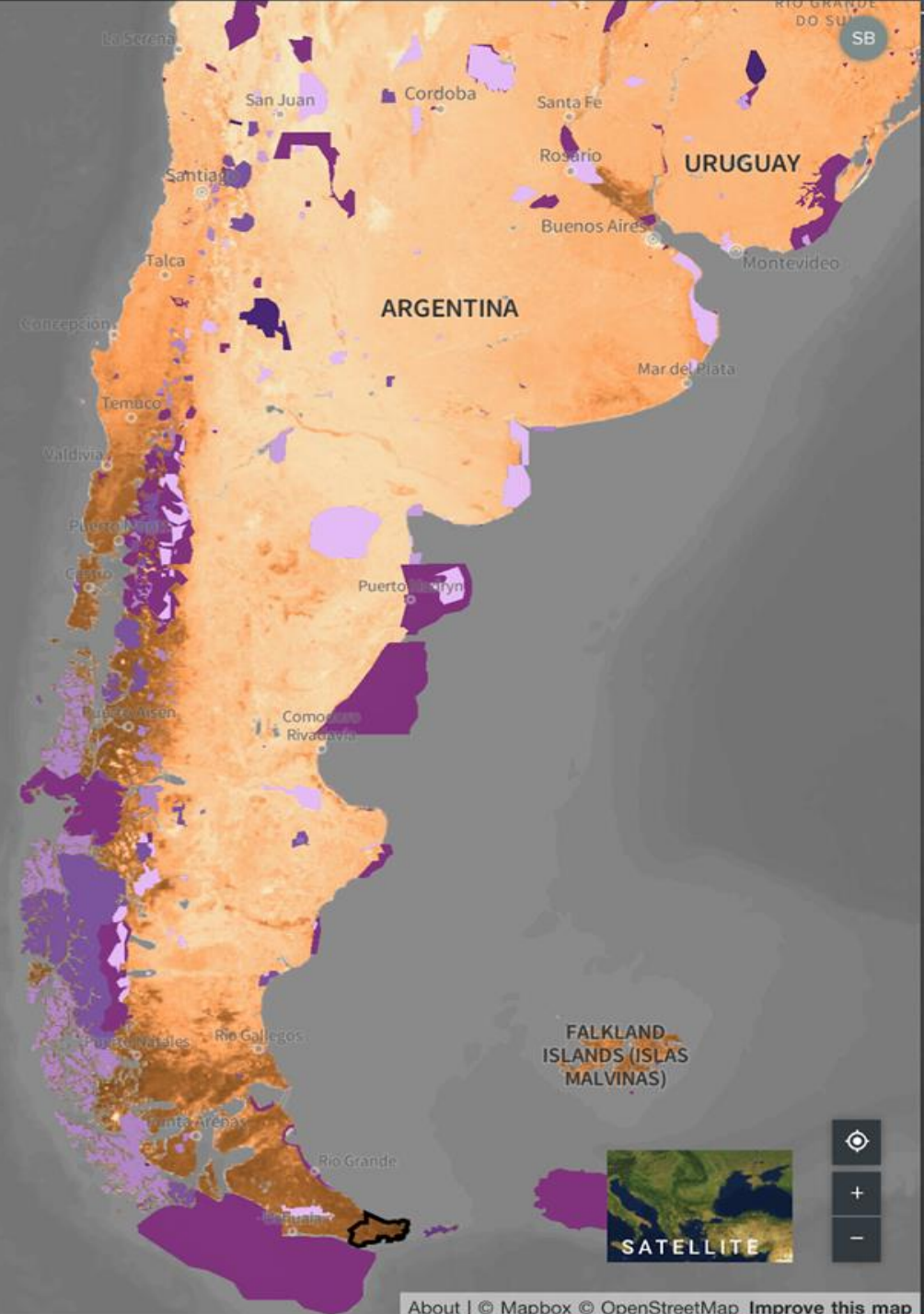
- WDPA All Categories
- WDPA Simple View
- IA - STRICT NATURE RESERVE
- IB - WILDNERNESS AREA
- II - NATIONAL PARK
- III - NATIONAL MONUMENT OR FEATURE
- IV - HABITAT AND SPECIES MANAGEMENT AREA
- V - PROTECTED LANDSCAPE OR SEASCAPE
- VI - PROTECTED AREA WITH SUSTAINABLE USE OF NATURAL RESOURCES
- UNCATEGORIZED

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WCMC TERRESTRIAL CARBON 2010

SOIL+BIOMASS CARBON

0 12.75 t/Km<sup>2</sup>





# UN Biodiversity Lab 2.0: 10-meter resolution data



ABOUT

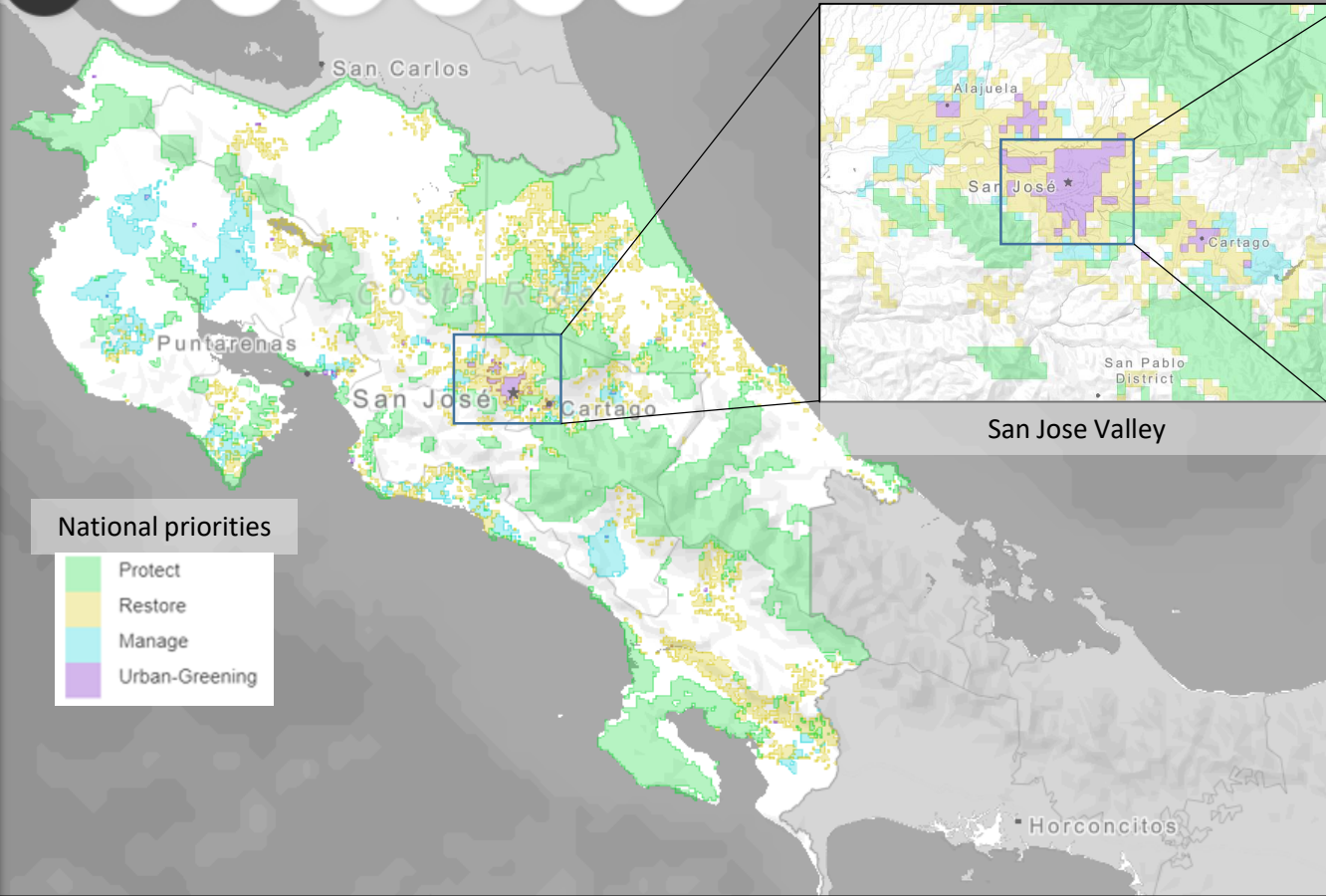
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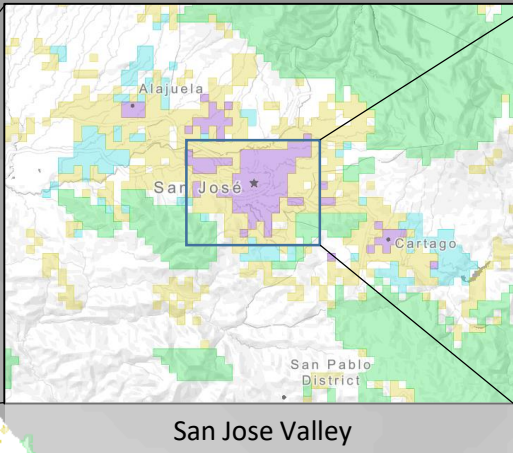
SUPPORT

MY PROJECTS

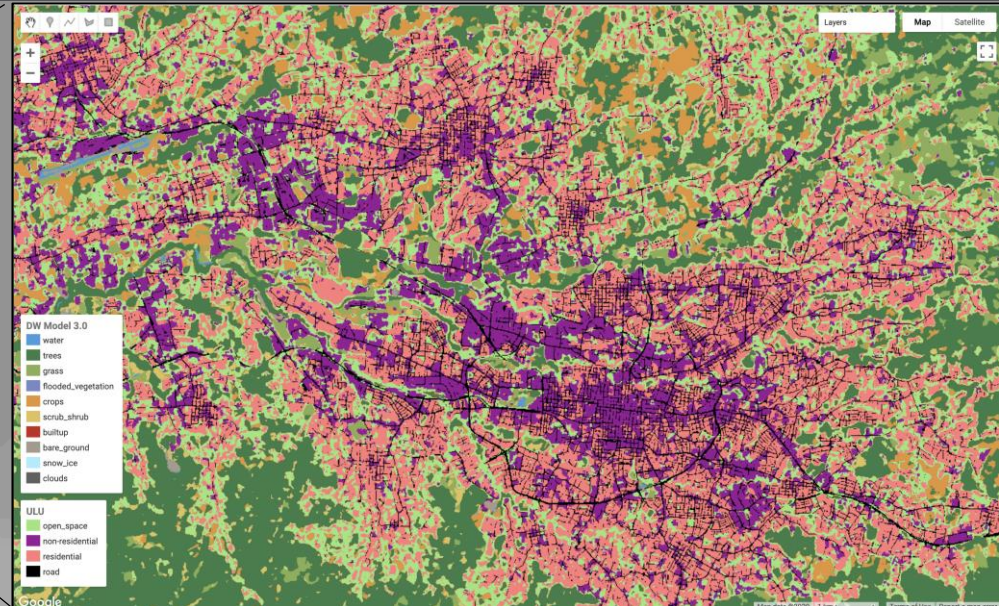


National priorities

- Protect
- Restore
- Manage
- Urban-Greening



San Jose Valley



5-meter resolution analysis of areas important for urban cooling with trees



# Q&A

## QUESTIONS TO JUMPSTART DISCUSSION:

- What strategies can we use to best ensure that wetlands are included within NDCs?
- How can we best leverage the UN Biodiversity Lab?
- What challenges are there to implementation?
- Do you have stories of success you would like to share?