



REGIONSADAPT

PROGRESS REPORT 2021-2022

Regional Governments Driving Climate Resilient Development



in partnership with



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Thanks to

Québec 

for its support to RegionsAdapt.

FOREWORDS

The Intergovernmental Panel on Climate Change (IPCC) has published their [Sixth Assessment Report on Impact, Adaptation, and Vulnerability](#), highlighting that the global climate crisis continues to affect our world deeply, with around 40% of the world's population highly vulnerable to the impacts of climate change. The IPCC underlines that **political commitment and implementation across all levels of government is a necessary condition for the effective implementation of adaptation actions.**

Tracking progress of adaptation is a key issue at the heart of current international negotiations on the [Climate Global Stocktake](#) and the [Global Goal on Adaptation](#). As regional governments are key actors in the implementation of innovative and ambitious solutions within their territories, they need to be involved and contribute meaningfully to these global processes.

The Basque Country is a region firmly committed to climate action, thus, participating and reporting our progress in international initiatives such as RegionsAdapt and the Race to Resilience. We understand that our way of addressing the climate crisis requires not only strengthening and broadening the regulatory framework, but also a firm political commitment in terms of funding and cooperation at all levels and between all stakeholders. **Only a coordinated action of political determination, funding, and multi-**

actor collaboration will create the necessary conditions for progress in neutrality and resilience goals in our territory.

To tackle the climate crisis, mitigation and adaptation must go hand in hand: emissions must be drastically reduced, and we must urgently work to adapt our territories to the impacts of climate change that we are already suffering from and will continue to suffer from in the near future. All of this must be done in a fair manner, taking into account the most vulnerable populations and geographical areas, and it must be based on the principles of co-responsibility and cooperation.

This progress report, in collaboration with CDP, is based on information reported by regions through the RegionsAdapt initiative. It is a key contribution from regional governments toward a common vision of progress and a Global Goal on Adaptation.

The Basque Country holds the presidency of Regions4, the network of regional governments for sustainable development, which celebrates its 20th anniversary this year. Regions4 is committed to strengthening and sharing regional government solutions towards adaptation so that regional governments are better armed with knowledge and tools for tackling the confirmed challenges ahead and for building resilient futures. **This report is a testimony of what we can achieve together.**



Ms Arantxa Tapia

Minister for Economic Development,
Sustainability, and Environment
[Basque Country](#)

FOREWORDS

The extreme weather events that have affected all regions of the world relentlessly over the past two decades reminds us of **the importance of taking action to reduce our carbon footprint. It also calls on us to intensify our efforts and to strengthen the resilience** of the international community and its economy to face the impacts of ongoing climate change.

Subnational governments are well aware of the urgency to act, as they have a front row seat to the devastating effects of climate change in their territory and to their society. Consequently, **they have been at the forefront of adaptation actions through ambitious strategies and innovative tools that center around the common goal of building resilience to climate change.** Québec, for example, adopted an ambitious new policy framework in 2020 called the Plan for a Green Economy 2030, which devotes more than 600 million Canadian dollars over the next five years, as well as numerous actions, to adapt to the future climate. In particular, the government will focus its efforts on key risks related to climate change and on developing knowledge and adaptation trajectories for planning interventions in a structured manner.

In this perspective, and to accelerate the pace in this field, Québec perceives international collaboration as a winning and necessary strategy for all subnational governments. It joined RegionsAdapt at its inception in 2015 and is among its most active members. The exchanges and activities organized by RegionsAdapt allow its members to acquire knowledge and skill necessary for implementing best practices for their geographic and climatic reality. This information is also publicly available on [CDP's Open Data Portal](#), an invaluable database which strengthens the resilience of subnational governments to climate disruption. Québec reports to this platform each year and presents its achievements and aspirations in this area.

Once again, Québec is proud to partner with RegionsAdapt for the publication of its annual report and its Community of Practice. This platform for mobilization and cooperation on climate change is essential. Sharing know-how among subnational governments and learning from their experiences is a rewarding exercise that stimulates innovation and helps to achieve the commitments of the Paris Agreement.



Benoit Charette

Minister of the Environment, the
Fight against Climate Change,
Wildlife and Parks
[Québec](#)

INTRODUCING REGIONS RACE TO RESILIENCE

RegionsAdapt mobilising ambition and representing regional governments within the UN Race to Resilience campaign.

RegionsAdapt is the climate flagship initiative of Regions4, a global network of subnational governments mobilizing ambitious leadership of regions for impactful action on climate, biodiversity and sustainable development, to build a resilient future for all.

Launched in 2015 at COP21 and coordinated by Regions4, **RegionsAdapt is the pioneering initiative that brings together leading regions on climate change adaptation, to foster collaboration, as well as learning and raising capacities.** With more than 70 signatory members impacting over 300 million citizens, RegionsAdapt is mobilizing ambition of regional governments on adaptation worldwide.

Since 2021, RegionsAdapt is an official partner of the [Race to Resilience](#), a UN-backed global campaign led by the [High-](#)

[Level Climate Champions for Climate Action](#) to build the resilience of 4 billion people from vulnerable groups and communities to climate risks, in collaboration with partner organizations from around the world. In so, RegionsAdapt is focusing on engaging subnational governments (states, regions and provinces) to catalyse changes, and is thus **the platform within the Race to Resilience that offers states and regions the unique opportunity to engage, showcase action and drive ambition**, according to their own contextually relevant local landscape.

By partnering with the Race to Resilience campaign, RegionsAdapt has pledged to:

RegionsAdapt Pledge



ENDORSE - 1

As the voice of subnational governments in the Race to Resilience, we aim to double the number of signatory regions, from 70 to 140. This will significantly increase the number of impacted people by 2030.

PRIORITISE - 2

We will contribute to effective policymaking by increasing the number of regions developing adaptations plans and integrating climate resilience in sectoral policies and local development planning.

SHARE - 3

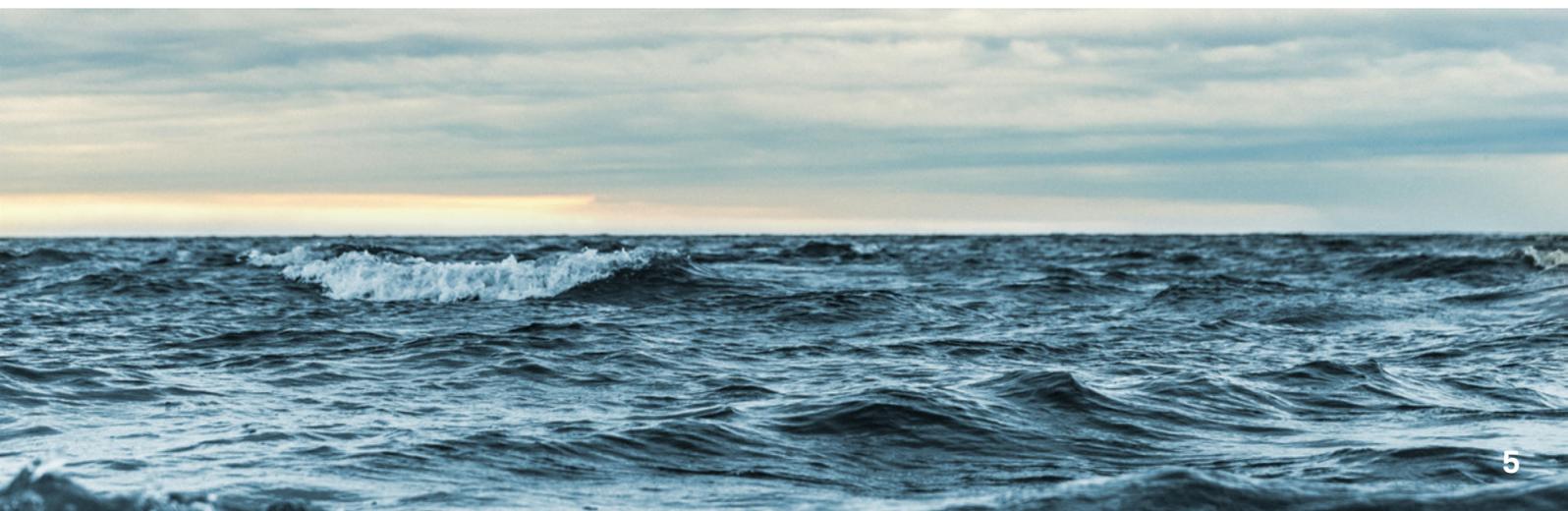
Through knowledge exchange, compilation and dissemination of good practices, as well as cooperation amongst peers, we will assist regions in developing, adopting and improving their adaptation plans.

ACT - 4

We will support regions with capacity building and information in order to multiply the implemented adaptation actions targeting vulnerable communities for a global reach.

TAKE STOCK - 5

Raising the number of regions reporting annually will enable us to upscale their actions internationally. Their annual progress will inform the Marrakesh Partnership and members' pathways on adaptation and resilience.





What states and regions commit to when joining Regions Race to Resilience

1

ASSESS climate change impacts through vulnerability assessments that includes all vulnerable communities



2

PLAN, prioritize and adopt an ambitious adaptation plan and/or programme (mainstreaming adaptation into other sectoral policies), including the most vulnerable, with interim targets and long-term goals



3

ACT by implementing concrete actions on adaptation in key identified priority areas



4

REPORT annually on their progress through RegionsAdapt / CDP reporting platform to inform and improve policies and actions



What RegionsAdapt offers to its members

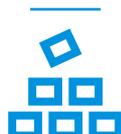
1

Shape a common voice through joint advocacy and collective messaging within key climate instances



2

Access useful tools and events, stay up-to-date with latest information, opportunities and resources



3

Join a dynamic network, learn from peers, exchange knowledge, experience, and good practice through our vibrant community of practice



4

Increase visibility and recognition showcasing experience in media, international events, and global campaigns and publicly disclosing to Race to Resilience and the RegionsAdapt annual report



If you wish to participate in this global campaign, visit our [website](#) and fill in the [online adhesion form](#).

When Regions join the Regions Race to Resilience, they demonstrate leadership on adapting to climate change and building resilience. The IPCC defines resilience as the capacity of social, economic and environmental systems to cope with a hazardous event or trend or disturbance, responding or reorganizing in ways that maintain their essential function, identity and structure while also maintaining the capacity for adaptation, learning and transformation.

INTRODUCING REGIONSADAPT REPORT 2021-2022

Since the start of the initiative in 2015, Regions4 has partnered with CDP, enabling member regions to report on their actions and progress through the online CDP States and Regions Questionnaire. Each year Regions4 then compiles and publishes its own report² to share this information widely.

The annual disclosure process gives a comprehensive view on the climate change risks RegionsAdapt members are facing, helps measure their progress, and supports peer-to-peer learning on adaptation actions with the aim that these can be used and replicated in other territories. Likewise, annual disclosure strengthens transparency and accountability, enabling RegionsAdapt to assess the evolution of

the global progress in adaptation and feed the information to the United Nations Framework Convention on Climate Change (UNFCCC), and in particular, the upcoming Global Stocktake, which will start in 2023. For analytical purposes, classifications between regions have been made either by country income level, as defined by the World Bank, or by the distinction between Global South/Global North.

The novelty in this year's edition is the alignment of this collective process with the framework of the Race to Resilience campaign, which aims to quantify the impact regions are having in building resilience as a result of the adaptation measures implemented. RegionsAdapt has worked to align the CDP States and

This year's report is based on two main sources of information: the CDP States and Regions Questionnaire, to which 32 regions have reported in 2021 and 2022, and 8 qualitative interviews which were carried out in collaboration with the Basque Centre for Climate Change (BC3).

Regions Questionnaire to the Race to Resilience metrics, as well as structured this year's report around progress on the four commitments of the Regions Race to Resilience, as mentioned previously.

Another characteristic of this year's report is the inclusion of relevant qualitative inputs collected through the CDP States and Regions Questionnaire. The Basque Centre for Climate Change (BC3), supported by Regions4, has conducted complementary interviews with 8 regions. We thank the involved regions for their valuable time and information, which led to the writing of a Master thesis³, on which this year's report is strongly based. The inclusion of this data complements the quantitative data.

Disclosing RegionsAdapt Members List



AUSTRALIA
South Australia

BRAZIL

Ceará
Goiás
Minas Gerais
Paraná
Rio Grande do Sul
Rio de Janeiro State
São Paulo State
Tocantins

BURKINA FASO
Centre Nord

CANADA
British Columbia
Prince Edward Island
Québec

COLOMBIA
RAP Pacífico

ECUADOR
Santa Elena
Pastaza

FRANCE
La Réunion

ITALY
Lombardy

IVORY COAST
Sud-Comoé

MEXICO
Baja California Sur
Guanajuato
Jalisco
Campeche

NIGERIA
Cross River State

SENEGAL
Gossas

SOUTH AFRICA
KwaZulu Natal

SPAIN
Basque Country
Catalonia
Navarra

UNITED KINGDOM (UK)
Scotland
Wales

UNITED STATES OF AMERICA (USA)
California

Qualitative interviews RegionsAdapt Members List

Catalonia (Spain), Consorcio de Gobiernos Autónomos Provinciales del Ecuador CONGOPE (Ecuador), Cross River State (Nigeria), Flanders (Belgium), Jalisco (Mexico), Lombardy (Italy), Québec (Canada), and São Paulo (Brazil).



² Access the previous RegionsAdapt reports: <https://www.regions4.org/publications>

³ Ruiz Beneitez, G. (2022) La planificación de la adaptación al cambio climático: un análisis del proceso de ocho gobiernos regionales [Master's Thesis, Universidad del País Vasco]

2021-2022 PROGRESS REPORT KEY FINDINGS

32 disclosing regions in 2021-2022

ASSESS

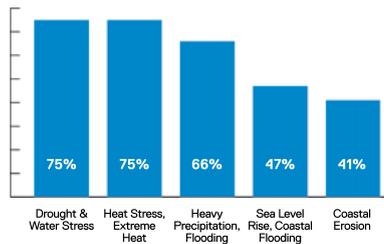
177
climate change impacts
in 2021-2022

53%
risk and vulnerability
assessment in place
in 2021-2022

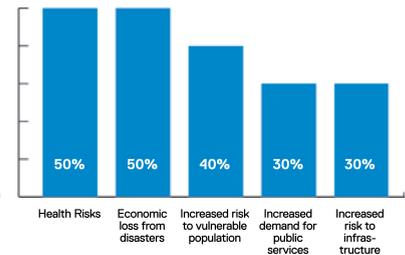
67%
of existing assessments
take into account
vulnerable people
in 2022

93%
regions report socio-
economic risks
in 2021

TOP 5 REPORTED CLIMATE HAZARDS
and share of disclosing regions who
reported facing such risks in 2021-2022



TOP 5 REPORTED SOCIO-ECONOMIC RISKS
and share of disclosing regions who
reported such risk in 2021



PLAN

Number of regions having an
adaptation plan in 2021-2022
- 72% in place
- 19% in progress
- 9% yet to be developed

71%
regions have at least
one adaptation goal
in 2021-2022



31%
regions have quantified
goals or monitoring
framework
in 2021-2022



ACT

Top 5 reported types of actions in 2021-2022

In 2021:
222
adaptation
actions



30% of actions
climate risk governance
and capacity building



18% of actions climate
proofing infrastructure
and services



15% of actions:
Sharing knowledge
and best practices

In 2022:
100
adaptation
actions

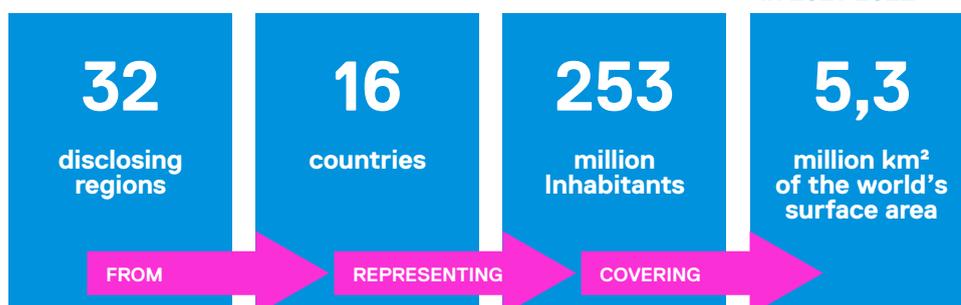


15% of actions:
Risks assessment
and monitoring



11% of actions:
Nature-based
solutions

REPORT



COMMITMENT 1: DEVELOPING RISK AND VULNERABILITY ASSESSMENTS

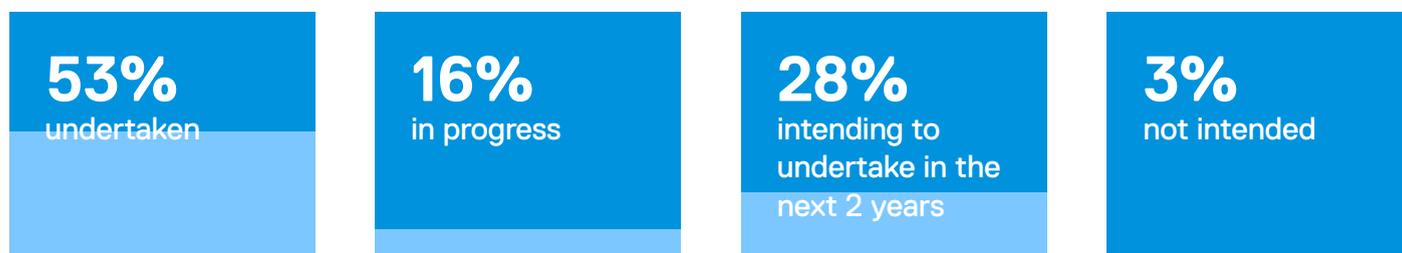
When joining *RegionsAdapt* and *Regions Race to Resilience*, regional governments commit to assessing the impacts of climate change in their territory by developing risk and vulnerability assessments that includes all vulnerable communities.

As stated in the IPCC Sixth Assessment Report, published in 2022, climate change is already affecting every inhabited region across the globe with human influence contributing to many observed changes in weather and extreme climate events. Evidence of observed changes such as heatwaves, heavy precipitation, droughts, and tropical cyclones, and in particular,

their attribution to human influence, has strengthened since the previous IPCC report in 2013. This scientific consensus, supported by people's increased awareness of the effects of climate change, is prompting more and more regions to prepare and conduct risk and vulnerability assessments to understand the current and future impact on their territory.

Risk and vulnerability assessments

Proportion of regions having developed a risk and vulnerability assessment in 2021-2022



When analysing the data provided through the CDP States and Regions Questionnaire, it appears that a **better understanding of risks and vulnerabilities remains an urgent need**: in 2021-2022, nearly half of reporting regional governments (53%) have undertaken a risk and vulnerability assessment, which is similar to the last report (54% in 2020).

While almost a quarter of the regions are developing their own methodologies for this purpose, **almost a quarter of the regions have reported basing their methodology on the IPCC models and climate change assessment guidance**. For instance, as IPCC defines climate change vulnerability as the combination of three components

(exposure, sensitivity, and adaptive capacity), **Minas Gerais** has developed a climate vulnerability index combined with indicators that represents each of these three components.

This increase of vulnerability risk assessments is a significant progress, as many regions, such as **Québec**, report that having **more data driven information and territorialized analysis of climate impact helps with political decisions and public awareness**. Such evidence is aligned with Lesnikowski, et al. (2016) who argues that regions tend to better implement measures after obtaining sufficient information and knowledge. It can also be noted that almost all regions from the European Union and the

United Kingdom have established a process to update these assessments at least every five years. However, in many regions, and **especially in Africa, data is still missing due to lack of funding and adequate expertise**.

Another study from BC3 analysing 226 adaptation policies in 57 regions shows that risk assessments are not always guiding the development of adaptation policies: **35-40% of policies do not use vulnerability or risk assessments and 92% do not align actions with identified risks** (Olazabal et al., 2019). These findings highlight the **urgent need to systematically use risk and vulnerability assessments to better inform policies and actions**.

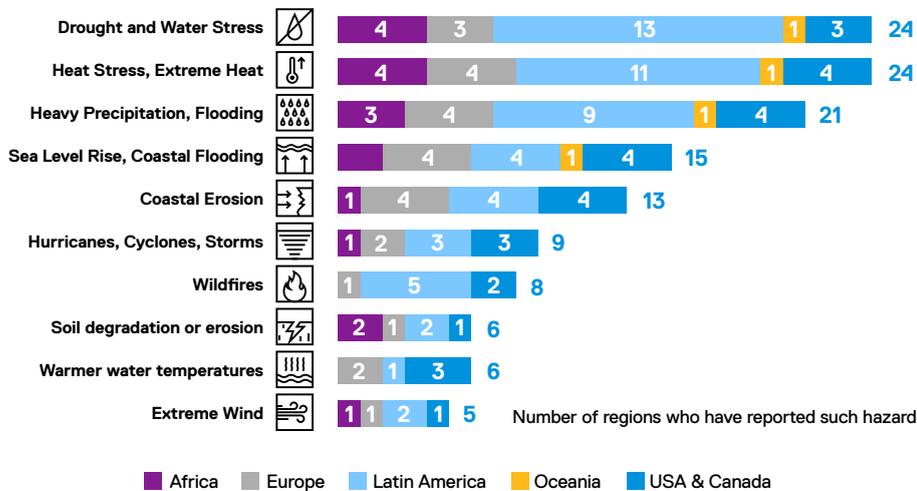


REGIONS IN ACTION: Discover recently published risk and vulnerability assessments

- In the **Basque Country (Spain)**, the project [Kostaegoki](#) provides information and online tools on sea level rise and the impact of waves on the Basque coast
- **Guanajuato (Mexico)** has updated their [Climate Diagnostic](#) in 2021
- **Prince Edward Island (Canada)** published their province-wide [Climate Change Risk Assessment](#) (CCRA) in 2021
- **São Paulo (Brazil)** develops risk-based vulnerability maps that are regularly updated
- The [UK Climate Change Risk Assessment](#) (CCRA3), published in June 2021, informs on vulnerability risks in **Scotland and Wales (United Kingdom)**
- **California (USA)** launched its [5th Climate Change Assessment](#) in 2022
- A short study of the vulnerability of the **Sud-Comoé region (Ivory Coast)** to climate change was published in 2021
- In **South Australia (Australia)**, a series of [regional integrated vulnerability assessments](#) cover the entire state and have resulted in regional adaptation plans
- **Paraná (Brazil)** is currently finalizing its risk vulnerability assessment which will soon be published. As a pilot study, it might be replicated in other Brazilian regions
- In **Navarra (Spain)**, the [LIFE-IP NAdapta-CC](#) project promotes resilience to climate change in the region and identifies the vulnerability of the territory by creating a [scorecard of indicators](#) to monitor the effects of Climate Change

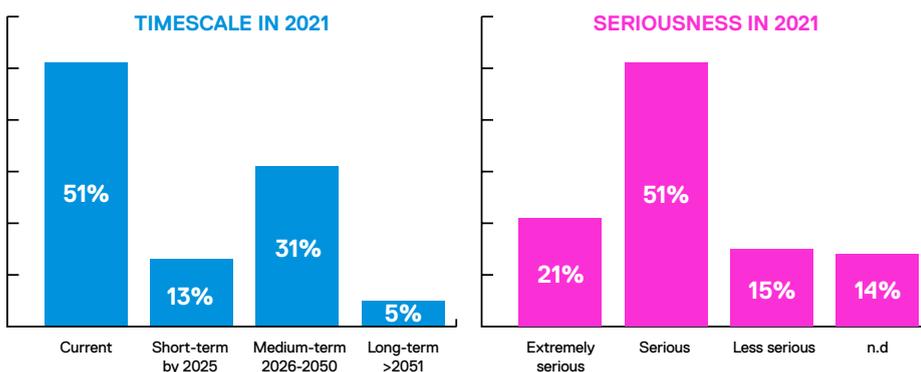
Main climate hazards

10 MOST REPORTED CLIMATE HAZARDS FACED BY REGIONS (in 2021-2022)



In 2021 and 2022, the 32 disclosing regions reported experiencing **177 climate change impacts**. A progressive modification of the classification of risks between 2020 and 2022 to better align with the new Race to Resilience framework has brought substantial changes in the methodology, thus direct comparison with previous years is not always possible. As the questionnaire has changed, some of the data are only available for either 2021 or 2022.

This graph shows that **impacts differ per continent and region**, with most reported climate hazards being drought and water stress (affecting 75% of regions), extreme heat (75% of regions), and heavy rain and flooding (66% of regions). Following 2020's results, **sea level rise and coastal erosion is a growing topic of concern**, impacting more than 4 disclosing regions out of ten. This new classification also allows regions to identify **wildfires and soil degradation as a growing concern for the first time**.



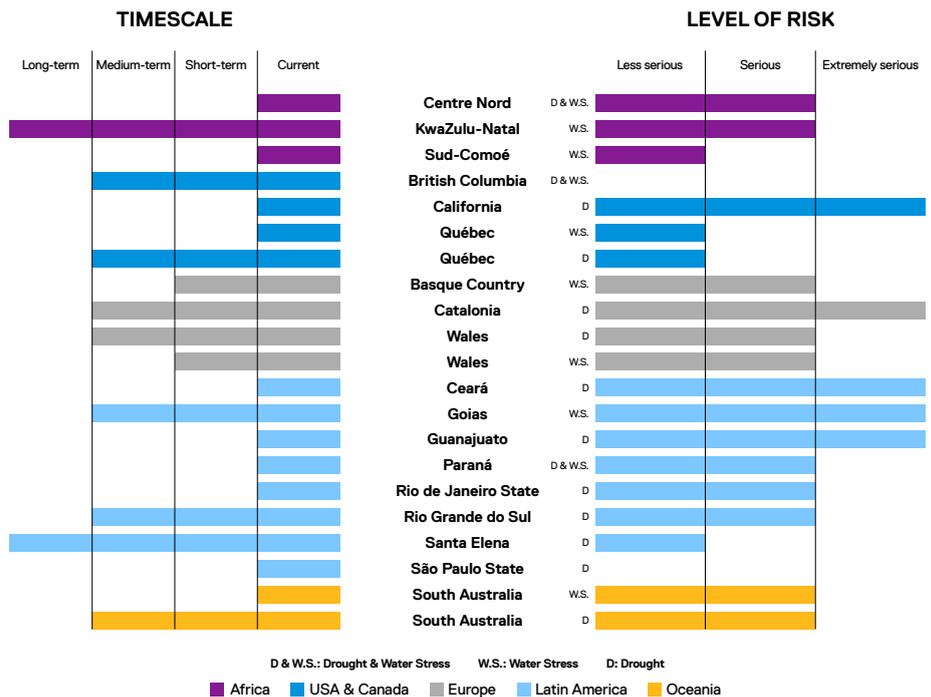
In 2021, 155 climate change impacts were assessed according to their anticipated timescale (in years) and their level of risk (defined by estimating the potential impact from the anticipated effect of climate change along with the likelihood of that effect occurring). Following similar trends of previous years, the most reported risks are considered as either serious (51%) or extremely serious (21%), with 51% of regions reporting that they are currently experiencing these impacts and 31% will experience them in the medium-term. This shows there is a **persisting urgency to implement short-term adaptation actions in the context of long-term planning to reduce the overall vulnerability of our societies and territories**.

FOCUS ON FIVE MOST REPORTED CLIMATE HAZARDS

DROUGHT AND WATER STRESS



DROUGHT and WATER STRESS decrease the quality and volume of water available for human use (including electricity generation), ecosystem use, livestock and irrigation and may result in increased conflicts over water use, agricultural losses, decrease in biodiversity of wetlands and aquatic habitats, and reduced forestry growth rate. Warming air temperatures throughout the 21st century will increase moisture loss from soils, which will lead to drier seasonal conditions even if precipitation increases and may also increase the cost and risk associated with forest fires. A secondary, but larger effect of droughts is the increased extraction of groundwater from aquifers.



In **Catalonia (Spain)**, more dry spells are expected, causing a possible increase of more than **20 days of severe drought** by 2050.

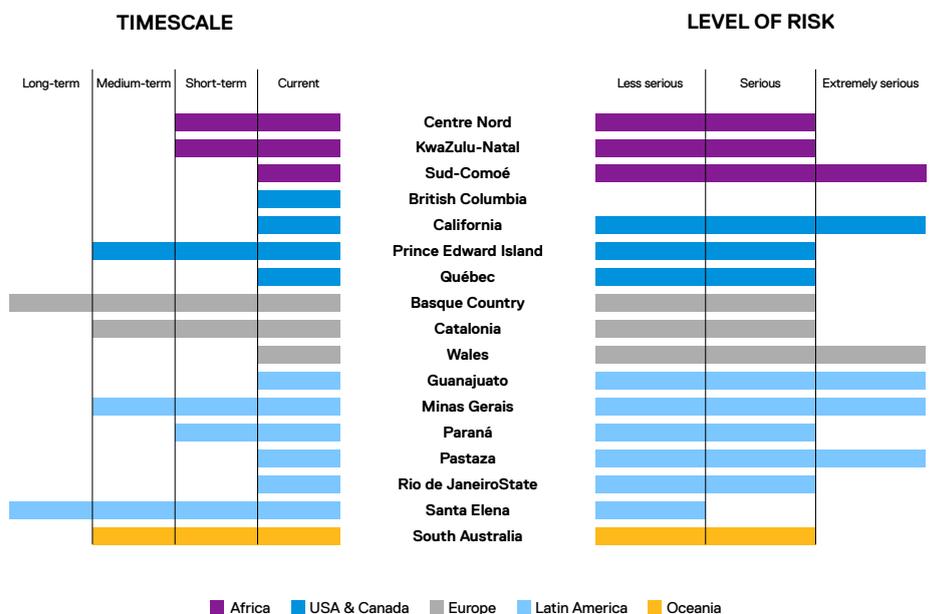
The drought that occurred in the 2021/2022 cycle in the state of **Rio Grande do Sul (Brazil)** resulted in a **56.1% drop** in the soybean harvest.

In **Centre Nord (Burkina Faso)**, the months of August, which used to be known as a month of frequent and abundant rainfall, are now experiencing large pockets of drought.

HEAVY PRECIPITATION AND FLOODING



HEAVY PRECIPITATION AND FLOODING may increase the chance of runoff events, landslides, unstable slopes and debris torrents, or exceed the capacity of drainage and sewage systems. This can also contribute to riverine or coastal flooding in human settlements and cities, as well as in industrial and farming areas which may impact crop productivity and quality. As a result of these impacts, there may be an interruption or delay of access for communities, industries, and emergency services. Additionally, these impacts cause injuries and potential increases in enteric illness from reduced source water quality for domestic use, negatively impacting the capabilities of treatment systems.



In **Catalonia (Spain)**, the probability of episodes of more than **200mm of rainfall** in 24h for 2021-2050 would be double that of 1971-2000, thus increasing catastrophic floods.

In **Minas Gerais (Brazil)**, the climatological model predicts a rainfall increase of **67 additional millimetres** in the monthly average in the year 2080, which may cause intense floods, further resulting in lives lost and material loss.

In **Scotland (UK)**, the best quality agricultural land at risk from fluvial flooding is projected to increase by **26%** by the 2050s, and **31%** by the 2080s under a **+2°C** at 2100 scenario.

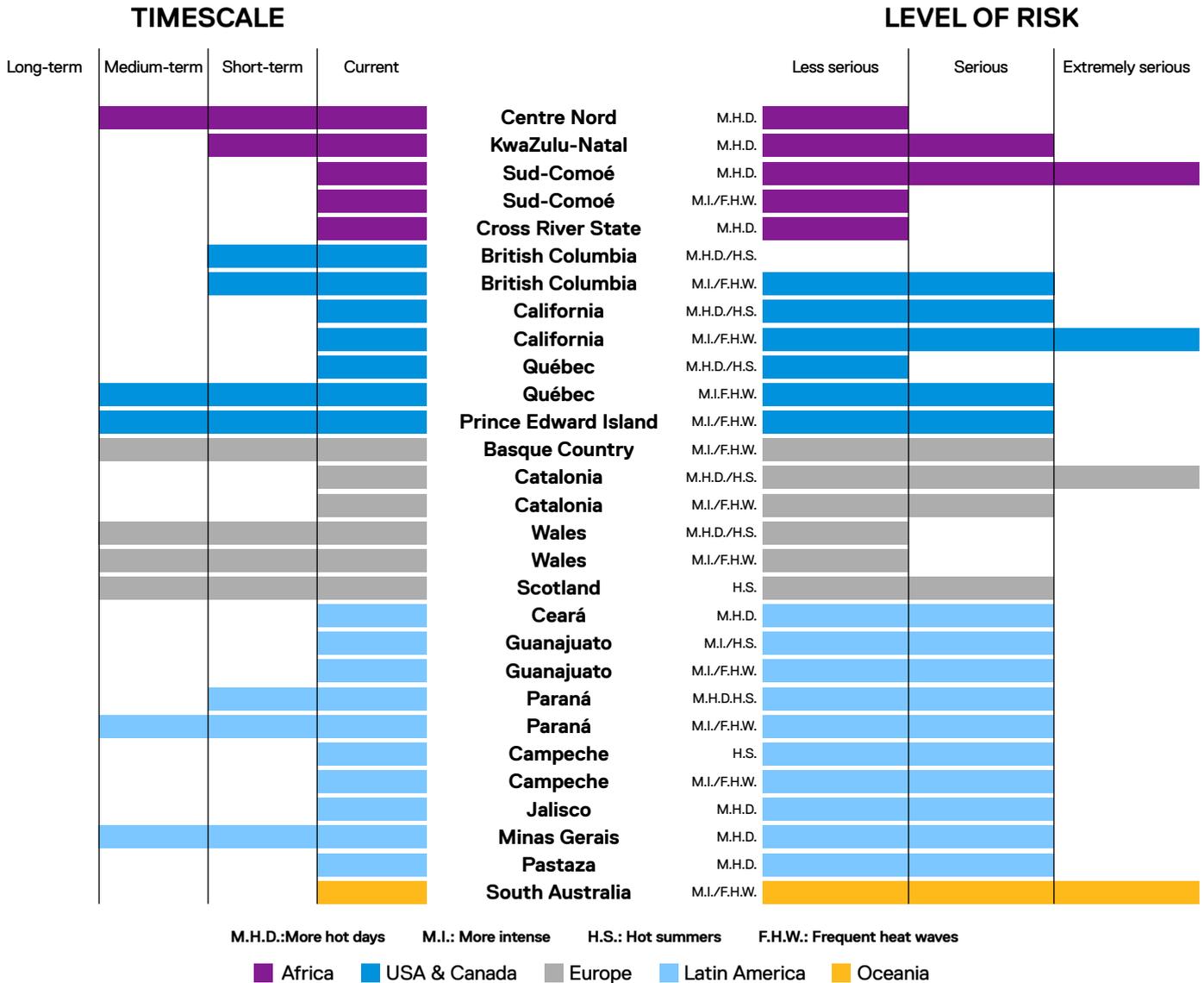
EXTREME HEAT EVENTS



EXTREME HEAT EVENTS may cause power outages and impacts to infrastructure and may contribute to increased evapotranspiration, reduced soil water, and stressed ecosystems. This could further increase the demand for

irrigation, decrease crop yields and quality, reduce potable water availability, and draw down on hydroelectric reservoirs, thus requiring water management strategies. In most disclosing regions, we can expect an increment of tropical nights, of the duration of the heatwaves, and of the number of summer days with a temperature higher than 30°C, which may result in an increase in energy demand for cooling as well as increased health risk—including potential mortality—to vulnerable populations such

as seniors, infants, and outdoor workers. Other health risks include respiratory syndromes and increased numbers and types of pathogens vectors and insect pests, further contributing to increased risk of water-, food- and vector-borne diseases. Last but not least, peatland carbon banks are also vulnerable to rising temperatures, thus, releasing more greenhouse gases and reinforcing the initial problem.



In **Campeche (Mexico)**, the average annual temperature is projected to increase in the range of **2.5°C to 4°C** between 1961 and 2099 (Factor CO2, 2014a).

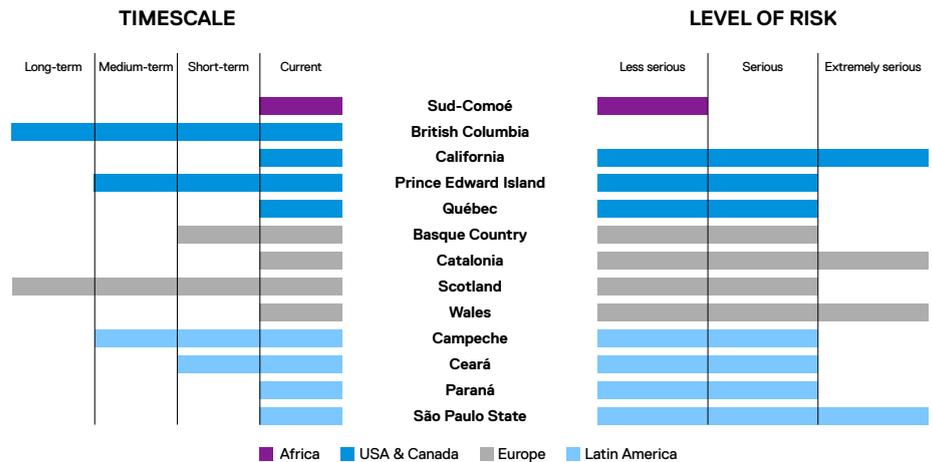
In **Scotland (UK)**, it is estimated that heat-related mortality will increase to around **70-285 deaths per year** by 2050, and **140-390 deaths per year** by the 2080s, assuming no population growth; a study of future heatwaves in Glasgow shows an increase from **0 heatwave days per decade to 5-10 heatwave days per decade** in the 2050s, and 10-50 heatwave days per decade in the 2070s.

In **Baja California Sur (Mexico)**, in the Guadalajara Metropolitan Area, there is a continuous trend of temperature increase: by 2090 the average temperature will have increased on average by **3°C in mid-low emission scenario and 3.6°C in a high emission scenario**.

COASTAL EROSION



Key consequences of unmitigated future **COASTAL EROSION** may trigger landslides and cause unstable foundations and washouts, which includes potential for long-term or permanent damage to infrastructure, especially transportation and wastewater infrastructure. There is also risk to endangered and at-risk species and unique natural environments, negative impacts to the tourism and recreation industry, as well as inundation or erosion of socio-cultural coastal communities and properties. It can also have mental health impacts, particularly as result of loss of sense of place.



In 2017, around **52%** of **São Paulo's (Brazil)** sand beaches were at "Very High" and "High" risk of coastal erosion and flooding.

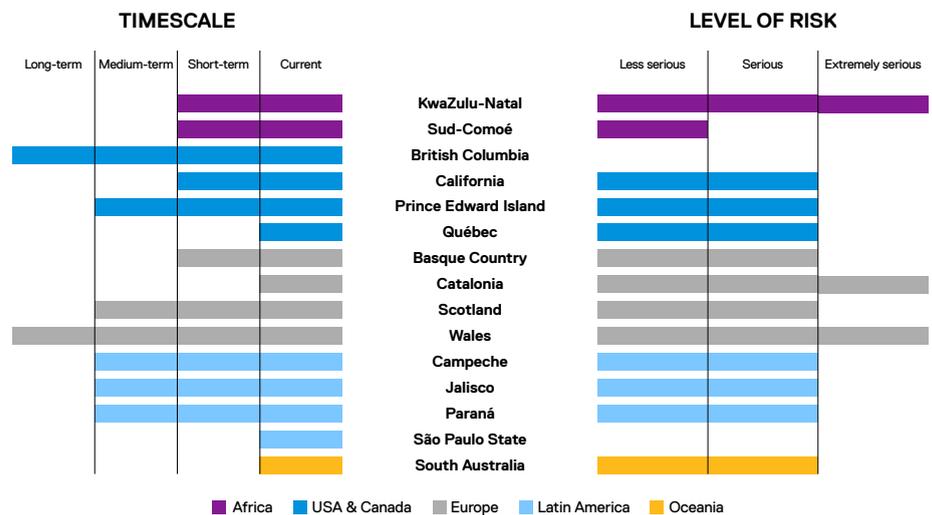
In the **Basque Country (Spain)**, beach areas would be reduced by about **15%** in 2050 and by **35-60%** in 2100.

31 to 67% of **Southern California (USA)** beaches may completely erode by 2100 without large-scale human interventions.

SEA LEVEL RISE



SEA LEVEL RISE poses threats to coastal communities, coastal ecosystems and resident species, highways, roads, bridge supports, critical infrastructure, airports at or near sea level, seaports, coastal access, and some transit system and rail lines. Sea level rise will have a major impact on how the transportation network is used and operated. Coastal farming communities are also more vulnerable as they deal with increased storm surge flood risk (increasing the need for diking infrastructure improvements) and face the challenges of salt water intrusion entering irrigation systems and accumulating in soils.

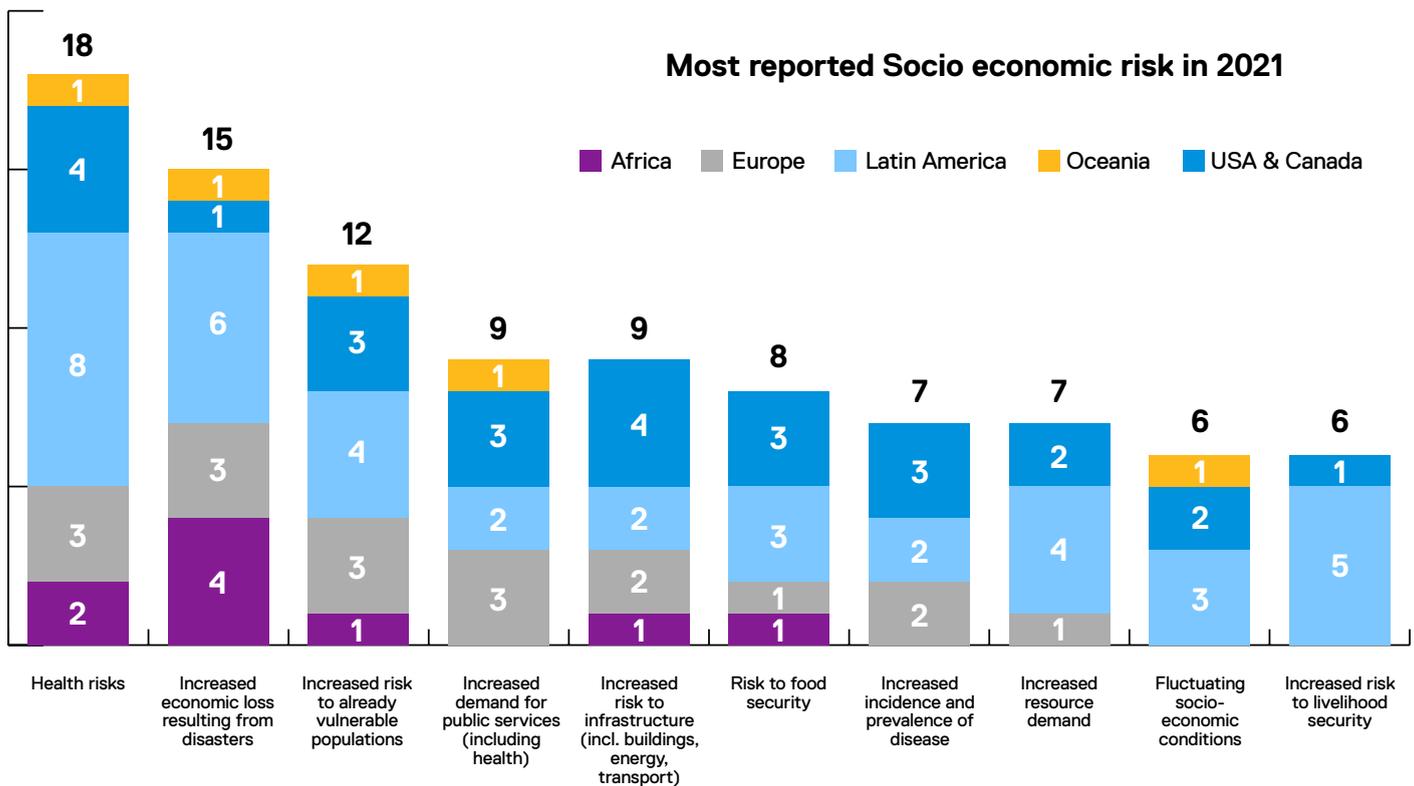


In **Jalisco (Mexico)**, the sea level rise is estimated to be **1 to 2 meters** in this century.

South Australia's (Australia) sea levels rose at an average rate of **1.5mm/year** over the 20th century and have been rising at an accelerated rate of over **4mm/year** in some locations since 1992.

As for **Wales (UK)**, the scenarios diverge significantly with potential increases in mean sea level rise between **31cm for the low emissions scenarios and 43cm for the high emissions scenarios.**

Socio-economic risks from climate change



Year after year, **substantial progress has been made in evaluating the direct and indirect socio-economic consequences of climate change.** From one report to another, there has been an **increasing number of regions (28 out of the 30 in 2021) reporting an increasing number of socio-economic risks (112)** due to climate change. In 2021, more than half of these risks are reported as currently happening--an increase in comparison to previous years-- which reflects the widespread impacts of current climate change to the society and economy and the costs for not acting to respond to growing risks. The 5 most reported socio-economic risks are: Physical and mental health; Economic loss; Vulnerable populations; Increase in demand for public health services; and Impact to infrastructure. This data is not available for 2022.

Half of disclosing regions mention that the effects of climate change will impact **physical and mental health, increasing the demand for public health services.** Examples of such impacts to mental health are increased trauma and stress for displaced populations or agricultural producers dealing with economic hardship resulting from drought, severe wildfire, flood events, and coastal erosion.

Economic loss resulting from disasters such as hurricanes, storms, wildfire, and floodings affect half of the regions and can lead to poverty and famish in some regions, notably in regions from the Global South.

Vulnerable populations have severely constrained adaptive capacities and may be disproportionately affected by any additional stressors, which can in turn

increase their financial, energy, or water poverty. Extreme climate events can lead vulnerable populations to situations of no return, with increased risk of loss and damages.

Climate change is expected to have a significant **impact on infrastructure.** Some of the greatest risks include damage or disruption to coastal infrastructure from erosion or storms, increase strain on electric utilities (related to the increased temperatures and likelihood of heat waves); risks to business from loss of coastal locations and infrastructure, cascading failures from interdependent infrastructure networks, and risks to infrastructure service, energy, transport, and digital infrastructure from flooding, high winds, and lightning.

Focus on Loss and Damages

The recent report of the IPCC on Impacts, Adaptation, and Vulnerability (2022) acknowledges the limits to adaptation and the current existence of irreversible losses and damages, especially in developing and lesser developed countries. These losses and damages, like animal extinction caused by climate change, lead to more financial constraints for adaptation. Different scenarios can be observed between regions, with industrialised regions being more familiarized with the concept and having the tools to work on it. The most vulnerable regions are in the process of integrating the concept into their plans or strategies; although, in general, they do not yet consider themselves ready to do so. Jalisco mentioned that, despite having advanced knowledge on the subject, it is far from their management capacity. Other regions, such as São Paulo, explained that this concept is one of the added values to the plan that is currently being elaborated. Their intention is to better understand what effects have been or will be suffered in the future, which could not be avoided through adaptation or mitigation strategies.



The challenge of including vulnerable communities

Top 5 most reported vulnerable groups in 2022 according to the countries' income.

HIGH INCOME	UPPER MIDDLE and LOW INCOME
1 Low-income households	1 Low-income households
2 Elderly	2 Marginalized/minority communities
3 Vulnerable health groups	3 Elderly
4 Marginalized/minority communities	4 Children and Youth
5 Outdoor Workers	5 Women and Girls

In 2022, 74% of disclosing regions mentioned that climate hazards will affect vulnerable populations; however, only 67% of the reported climate risk and vulnerability assessments explicitly take into account these vulnerable populations.

This highlights the **gap between the harsh reality already faced by vulnerable populations and their lack of inclusion in assessments or planning**. Risk assessments should be an opportunity to help identify and target the most vulnerable. Adaptation

policies provide an opportunity to address social justice, although it can be a double-edged sword. If society's goals, priorities, and visions are not considered, adaptation policy risks to reinforce existing inequalities and vulnerabilities (Kuhl, 2021).

REGIONS IN ACTION: British Columbia's Indigenous Climate Resilience Capacity-Building Pilot Project

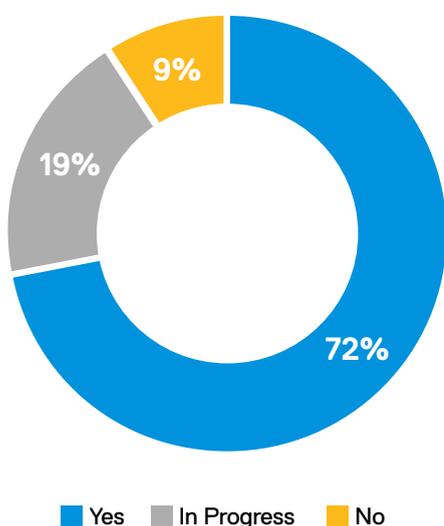
In British Columbia, Canada, Indigenous engagement and advisory group feedback identified the need to support Indigenous Nations, communities and organizations to address climate risks and pursue adaptation planning projects and funding. Regional Indigenous supports for communities and organizations along with mentorship, knowledge products, adaptation training and a learning network were prioritized. The Province will explore ways to improve this critical gap by undertaking a one-year pilot project to support Indigenous climate resilience capacity building and training. Additionally, future approaches taken in assessments of climate risk will align with commitments made through the Declaration on the Rights of Indigenous Peoples Act, and recognize the unique impacts to Indigenous territories, values, and ways of life.

COMMITMENT 2: ADOPTING AMBITIOUS ADAPTATION PLANS

When joining the RegionsAdapt initiative and Regions Race to Resilience, regional governments commit to planning, prioritize, and adopt an ambitious adaptation plan or programme, mainstream adaptation into other sectoral policies, including the most vulnerable populations, and establish interim targets and long-term goals.

An increasing number of regions with climate adaptation plans

Proportion of regions with adaptation plans in place



In 2021 and 2022, **72% of the 32 disclosing regions reported having a climate adaptation plan**. This shows progress compared to previous years (68% in 2020). As underlined during the qualitative interviews, **the main reason regions have increased their efforts is due to the harsh consequences and impacts of climate change, especially extreme weather events** which have increased in recent years. **CONGOPE** commented that “the country has made progress in adaptation for survival beyond the international agenda”. This is the perception of most regions which say they have increased adaptation measures because of the suffering and costs caused by the impacts of climate change in their territories rather than because of the evolution of international agreements. Even so, these agreements have had their influence, especially in structuring measures following the guidelines and strategies agreed of the European Union, as is the case of **Flanders**.

The interviews and the CDP data show that **planification progress has been uneven across regions**. Industrialised regions, such as those in Europe or **Québec**, are the regions with the longest adaptation journey. Most of the high-income regions explained that they are in the process of developing or even implementing their second set of adaptation plans or strategies, while regions from the Global South have recently implemented or are in the process of developing their first plan or strategy. On the other hand, **Centre Nord, RAP Pacifico and Sud-Comoé** explain that they do not intend to develop climate adaptation plans in the near future, as they lack the financial resources and expertise.

Industrialised regions have made more progress in developing their adaptation plans than middle-income and lower-income regions due to lack of funding and expertise to start the process.

Mainstreaming adaptation into other sectoral policies

Mainstreaming adaptation in other sectors has always been one of the main challenges identified for effective adaptation implementation, especially as some adaptation measures will not be labelled as such, and so can be implemented in silos which complicates its monitoring and data collection. **However, there has been undeniable progress in mainstreaming adaptation in other sectors along with better coordination between departments**⁴. This has been facilitated in some cases by the creation of coordination mechanisms focused on climate change: **Catalonia**, for example, has progressed a lot in terms of adaptation since 2012, and adaptation has managed to find its place in the sectoral agendas. This is partially due to a government coordination mechanism

through the Interdepartmental Commission on Climate Change, in which all the departments of the Government of Catalonia are represented, as well as due to the adoption of Catalan Law 16/2017 on climate change (1 Aug 2017), which stipulates how sectoral government departments should incorporate climate change adaptation into their sectoral policies. In the case of **Flanders**, there is the Flemish Taskforce, a mechanism coordinated by the Department of Environment and Spatial Development, where different departments work together on adaptation. **Cross River State** uses the Climate Change Council to coordinate between departments. Finally, **Jalisco** mentioned two mechanisms: the Diploma for Public Servants and the Inter-institutional Commission for Climate Change Actions.

The former serves to address environmental issues and commitments, while the latter is based on working groups that meet every two months to address adaptation and mitigation issues. **Jalisco** commented that progress has not yet been uniform, as some sectors have progressed more than others. Ecosystem-based adaptation has made the most progress, while community-based adaptation, infrastructure, and others have followed trends that are often contradictory to adaptation. This statement is in line with the literature, which states that the environment, water, and agriculture sectors report the most initiatives; although, increases are also observed in other sectors (Lesnikowski et al., 2016).

REGIONS IN ACTION: Guanajuato's intersectorial mechanism to accelerate adaptation

Guanajuato (Mexico), has established the COCLIMA, an Intersecretariat Commission based on the Climate Change Law for the State of Guanajuato and its municipalities. Its objective is to coordinate that the agencies and entities of the State Public Administration drive, promote, plan, and execute cross-cutting and articulated actions for climate change mitigation and adaptation to achieve sustainable regional development. In practical and operational terms, it focuses on the realisation of workshops, meetings, and interviews between the working groups, members of COCLIMA, and other sectors and heads of the agencies that are part of it. The main actions that have been taken successfully so far include: updating the State Law on Climate Change; creating the State Climate Change Program, developing a roadmap for adaptation through Nationally Determined Contributions (NDC), and identifying regional risks and vulnerabilities in terms of climate change.

⁴ Explore this theme further by reading our corresponding [RegionsAdapt Brief for action n°1](#).

Establishing interim targets and long-term goals

Of the 32 disclosing regions, **23 have reported having at least one adaptation goal in place (72% of regions)**. The most common topics that these goals relate to are biodiversity protection, effective governance measures and water resources management. Almost half of the disclosing

regions have set targets for 2030 or beyond. However, **only 10 regions have developed quantified goals, clear expected outcomes, or developed a monitoring and reporting framework to assess these goals**. Six regions reported that the lack of access to quality or relevant data due

to the absence of monitored measures and information collection is still a major barrier. (See [Commitment 4 on page 34 for more information on the monitoring of adaptation plans.](#))

Regional Governments and Their Climate Adaptation Plan or Programme

Baja California Sur	Plan Estatal de Acción ante el Cambio Climático del Estado de Baja California Sur (2012)
Basque Country	Climate Change Strategy, Klima 2050 (2015) Energy Transition and Climate Change Plan 2021-2024 (2021) 
British Columbia	Climate Preparedness and Adaptation Strategy (2021) 
California	Safeguarding California Plan: 2018 update (2018)
Campeche	Programa Estatal de Cambio Climático (2015)
Catalonia	Catalan Strategy for Adapting to Climate Change 2013-2020 ESCACC20 (2013) Draft Catalan Strategy for Adapting Climate Change 2021-2030 ESCACC30 
Goias	Decreto N° 9.891, de 22 de Junho de 2021 (2021) 
Gossas	Plan climat territorial intégré de Fatick (2015)
Guanajuato	Programa de Adaptación al Cambio Climático del Estado de Guanajuato (En proceso de publicar)
Jalisco	Programa Estatal para la Acción ante el Cambio Climático - PEACC (2022) 
KwaZulu-Natal	Climate Change Adaptation Action Plan for the KwaZulu-Natal Province (2017)
La Réunion	Regional Climate Air Energy plan – SRCAE (2013)
Lombardy	Action document for Adaptation to the climate change in Regione Lombardia (2016)
Minas Gerais	Estratégia de Adaptação Regional às Mudanças Climáticas para Minas Gerais (2018)
Navarra	Hoja de Ruta de Cambio Climático-KLINA (2018)
Pastaza	Estrategia de Cambio Climático de la Provincia de Pastaza con enfoque de Género 
Prince Edward Island	A Climate Change Action Plan For Prince Edward Island 2018-2023 (2018)
Québec	2030 Plan for a Green Economy (2020) With its implementation plan related to the 2022-2027 
Rio Grande do Sul	Extreme Events Management State Program (2017)
Santa Elena	Plan Nacional de cambio climático (2015)
São Paulo State	In progress
Scotland	Climate Ready Scotland: Scotland’s Climate Change Adaptation Programme 2019-2024 (2019)
South Australia	South Australian Government Climate Change Action Plan 2020-2025 (2020) 
Wales	Prosperity for All: A Climate Conscious Wales (2019)

Enabling environments and main barriers

As the IPCC’s last report states, **enabling conditions are key for implementing, accelerating, and sustaining adaptation in human systems and ecosystems**. This includes political commitment and follow-through, institutional frameworks, policies, and instruments with clear goals and priorities, enhanced knowledge on impacts and solutions, mobilization of and access to adequate financial resources, monitoring

and evaluation, and inclusive governance processes. While the keys to success are easily known, the conditions are not always favourable for implementation. During the interviews, for instance, **the most frequently cited barriers have been institutional** (all the 8 interviewed regions report having them), followed by **technical** (named by 5 regions), **regulatory** (4) and **financial** (4). On the other hand, 3 regions

reported suffering from other constraints that are not identified in these groups, such as political and social awareness, lack of consensus between political and scientific actors, and the difference in the importance given to mitigation versus adaptation. However, there has been progress in most aspects.

Institutional frameworks, policies, and instruments

There has been **progress on regulation and legislation worldwide**, with many regions having, or being in the process of **developing specific climate change laws**. For instance, **Catalonia** explained that the decisive factor for progress in adaptation has been the approval of the Climate Change Law of Catalonia in 2017. In **Québec**, a law on effective governance of climate change and electrification obliges the government to develop methodologies and guidelines for adaptation that take into account future climate evolution. In **São Paulo**, a state decree on climate change that includes adaptation was signed in July

2021. Other regions are **adapting existing laws to increase the resilience to climate change**. **Jalisco** is one such region that is making its wilderness protection procedure more flexible to promote ecosystem conservation and thus, increasing resilience. Fifty sites have recently been placed under the legal scheme of protection, such as protected natural areas (at federal, state and municipal levels), environmental recovery zone, Ramsar sites, and voluntary schemes. **Cross River State** is another case in point, as they have an active Forestry Policy under the law, and are in the process of implementing new policies

within the framework of such protection. The **Basque Country** has included Climate Change in the “Basque Guidelines for Spatial Planning”, with a special emphasis in green infrastructure, urban regeneration, and limiting artificialization, as well as elaboration of a municipal vulnerability and risk index. They have included a Climate Change adaptation and vulnerability index in some master plans as well as in some demonstration projects. Nonetheless, despite many regions actively changing their climate-related laws, they still suffer from **regulatory obstacles due to the slow process of implementation of these laws**.

REGIONS IN ACTION: Elaborating a New Climate Framework in Baja California Sur

Within the collaboration between the Mexico-UK PACT Programme and the civil society organization Politics and Environmental Legislation A.C. (POLEA), a participatory process took place in order to draft a climate change law for the State of Baja California Sur. The objective of this process lies in the need for the State to count on a climate legislation that is in harmony with the new national and international commitments derived from the ratification of the Paris Agreement, the Escazu Agreement, and the 2030 Agenda for Sustainable Development. Having a climate change law will allow for a clear and robust legal framework that reflects the need for the scaling-up and acceleration of wide-ranging, multi-level and sectoral mitigation actions, as well as for incremental and transformative adaptation in order to reduce climate change related risks. [Click here for more information.](#)

Enhanced knowledge on impacts and solutions

When it comes to **knowledge on impacts and solution**, regions reported that significant progress has been made in this area, with an **increase in access to information and training on climate change**. **Minas Gerais**, for example, focuses on community engagement and offers territorial training on climate change and disaster risk reduction and facilitates access to key information through an [online platform](#). In **São Paulo**, climate change is being incorporated in all education programmes in the region, and in **Québec**, skills development, workforce training, and other various initiatives are being developed to build a more resilient society.

Raising knowledge of decisions makers and administrations is also a key aspect: in **Jalisco** in 2021, a diploma course on mainstreaming climate change was held for public servants; it will continue on an annual basis from now on. In **Lombardy**, the School for Environment, organized by the Regional Environment Protection Agency, was born to enhance the effectiveness of public action in safeguarding the environment at a regional level through training activities that facilitate collaboration between the various institutional levels involved and which also works to enhance and compare existing professional skills. A specific module on climate change for decision-makers was developed to enlighten scientific evidence, international agreements, and national and

regional commitments. **Lombardy** stressed that the **complicated coordination between the scientific and political worlds acts as a significant barrier**. Both have different approaches and it is difficult to reach a consensus. Indeed, there is evidence that although the production of climate science has grown, its usefulness in decision-making and policy-making remains relatively limited (Dilling & Lemos, 2011).

Regions interviewed equally mentioned the relevance of **active participation in networks to facilitate the dissemination of knowledge and good practices**, whether international (such as Regions4, Under2 Coalition, REDD+), regional, or local.

REGIONS IN ACTION: Preparing the future generations to adapt to climate change in Sud-Comoé

The Regional Council of **Sud-Comoé**, Ivory Coast, plans to contribute to the reduction of youth unemployment by preparing future generations for the energy transition and the agroecological transition needed to guarantee the sustainable development of the Region. In this regard, and as part of the adaptation measures and the fight against harmful soil degradation and atmospheric pollutants, the Regional Council is implementing a project on “Socio-professional integration of young people and the promotion of the green and circular economy in the South Comoé Region” in partnership with the European Union. More than 177 young people and 23 market farmers are being trained in sustainable vegetable farming techniques. At least 30% of those trained are adopting green economy practices.

Mobilization of and access to adequate financial resources

Adapting to the impacts of climate change requires the deployment of a significant amount of resources.

Public finance sources are often used to support projects in the infrastructure sector as returns on investment are often not quite attractive to private investors. These sources include contributions from national budgets, bilateral and multilateral development funds, and UNFCCC operational funds, such as the Adaptation Fund or the Special Climate Change Fund (Christiansen et al., 2012; Haites & Mwape, 2013). Private sources of finance are often allocated to adaptation measures that offer a predictable return that is comparable to the returns and investment risks of other non-adaptation measures.

Through the interviews, six main different sources of funding were identified:

environmental funds, national and regional budgets, international cooperation, carbon markets, government sources, and government credits, all of which are also reflected in the CDP data below. The **most frequently mentioned climate funding mechanisms were budgets**, at the national and regional level. However, in most cases, the regions have stated that the resources received from the national budgets are scarce. **Jalisco**, for example, mentioned that they have received around 18 million of Mexican pesos in the last 3 years, an amount that falls short from what is needed to make progress in adaptation. **Catalonia**, pointed out that most of the funding they receive comes from the regional government budgets. As for **Lombardy**, they receive contributions from the state budget for specific measures.

This trend is corroborated by the CDP data that indicates that the “**Jurisdiction’s own resources**” have been cited **three times more often than “National funds and programmes”** as funding sources for the most significant adaptation actions. **The two other common sources of funding are environmental funds (4) and European funding (3).**

However, the lack of financial and resource availability is still one of the main obstacles to the implementation of adaptation measures reported by middle-income regions, both in interviews (**Jalisco, Cross River State, São Paulo and CONGOPE**) and in CDP data (**Ceará, Catalonia, Guanajuato, Tocantins, Sud-Comoé**), as well as stated by two industrialized regions (**Catalonia and Prince Edward Island**).

CDP DATA: Number of times the funding source has been cited	High income regions	Upper middle-income regions	Low and Lower middle-income regions	TOTAL CITATION NUMBER
Jurisdiction’s own resources	44	13	2	59
National funds and programmes	15	4	1	20
Regional funds and programmes	5	6		11
Public-private partnerships	4	4	1	9
International (including ODA & Europe)	2	6	1	9
Private partnerships (e.g., a combination of private investments)		4	1	5
Climate finance (carbon credits)	1	2		3
Other		1		1

REGIONS IN ACTION: Experimenting with innovative financing mechanism in Québec, Catalonia, and Lombardy

In industrialized countries, some innovative paths are created to allow regions to create their own resources: in **Québec**, for instance, all climate actions are financed by their carbon market and government credits, whereas the **Catalan** climate fund for mitigation and adaptation policies is financed through different taxes, such as the tax on CO₂ emissions from cars, motorbikes and commercial vans, which raises around 150 million euros per year (estimate year 2022). Fifty percent of this goes to climate policies and the other 50% to the biodiversity fund. In addition, other taxes are used, such as the taxes applied to the economic activities outside the emission allowance market and the port emissions tax on large ships. The **Lombardy** region established the Fund for Green Areas, which compensates for the environmental loss due to soil use and transformation. At the moment, 98 hectares of regional territory are subjected to interventions financed by the fund with total resources invested of 5,5 million euro (5,2 million euro from regional funds).



Multilevel governance

Since COP21 in Paris, **multilevel governance (MLG) has become the main approach to explaining, establishing, and implementing climate change action** (Sainz de Murieta & Setzer, 2019). When it comes to vertical governance, where different levels of government within a country rely on each other and complement each other to effectively implement the Paris Agreement, 43% of disclosing regions indicate working on climate adaptation with cities and local governments in 2021, while only 33% collaborate with the national government. This reflects a trend noted during interviews where **more coordination between the regional and local levels is recognized than between regional and national levels**. Regions such as **Jalisco** or the Ecuadorian regions represented by

CONGOPE have been encouraged to create new institutions between the regional and local levels to facilitate the coordination among them. In the case of Jalisco, these institutions are called Inter-municipalities and do not depend on political changes. In Ecuador, they are called *Mancomunidad*, and they also facilitate multi-actor participation. Nevertheless, there seems to also be **some progress in terms of collaboration with higher government levels**. In this regard, many collaborative initiatives were mentioned: in **Jalisco**, they have made progress in communicating with the national level thanks to actions such as the creation in 2012 of inter-municipal bodies called *Mancomunidades* situated between the regional and local levels that facilitate communication between

the two. In **Flanders**, a coordinating mechanism between the central and regional governments called the National Commission of Climate Change coordinates administrative working groups in which regions exchange information, knowledge, and practices to carry out adaptation in the most effective way. They are currently developing the new national adaptation plan. It is also worth noting that in many regions from the Global South, such as **Ceará, Goiás, Guanajuato, Minas Gerais, Rio de Janeiro, Sud-Comoé, and Tocantins**, the **necessity of implementing the Nationally-Determined Contributions (NDCs) seem to result in increased collaboration between national and regional governments**.

REGIONS IN ACTION: The Spanish Pyrenees: an example of cross-border collaboration

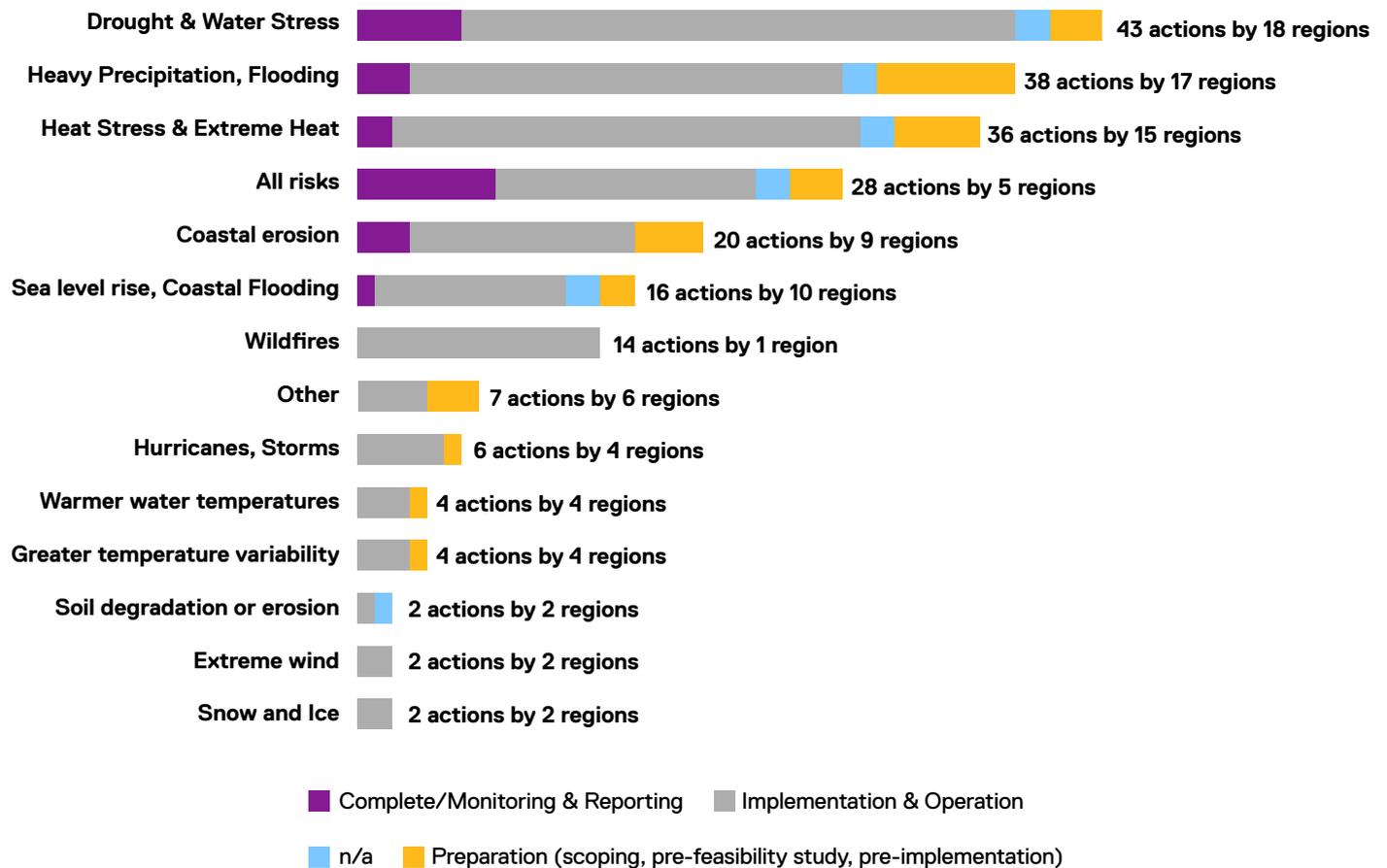
Horizontal governance encourages learning across departments or institutions in the same region, as well as between sub-regional governments. The Pyrenees is a mountain bioregion that is particularly vulnerable to the effects of climate change, with tremendous impact on biophysical and socioeconomic systems like flora, fauna, water resources, energy, tourism, and also farming and grazing. The [Pyrenean Climate Change Strategy](#) (PCCS) provides a framework that complements existing strategies of the eight Pyrenean territories (**Andorra, Nouvelle Aquitaine, Aragon, Catalonia, La Rioja, Basque Country, Navarra, and Occitanie**) while taking into account two differentiating factors: a cross-border focus and the specific nature of the mountains. The PCCS was developed between June 2020 and September 2021 thanks to an inclusive and participatory process including the collaboration and contribution of hundreds of representatives from the scientific, political, and socio-economic spheres. In parallel, the project [Interreg POCTEFA Adapyr](#) (2020-2022) focuses on data observation, capitalization of available information and transfer of knowledge in the context of cross-border cooperation, while the project [LIFE MIDMACC](#) promotes adaptation through the implementation and testing of different landscape management measures to meet climate change related challenges in marginal mid-mountain areas of Spain (**La Rioja, Aragon, and Catalonia**).

COMMITMENT 3: **IMPLEMENTING CONCRETE** **ACTIONS ON ADAPTATION**

When joining the RegionsAdapt initiative and Regions Race to Resilience, regional governments commit to implementing concrete actions on adaptation in key identified priority areas.

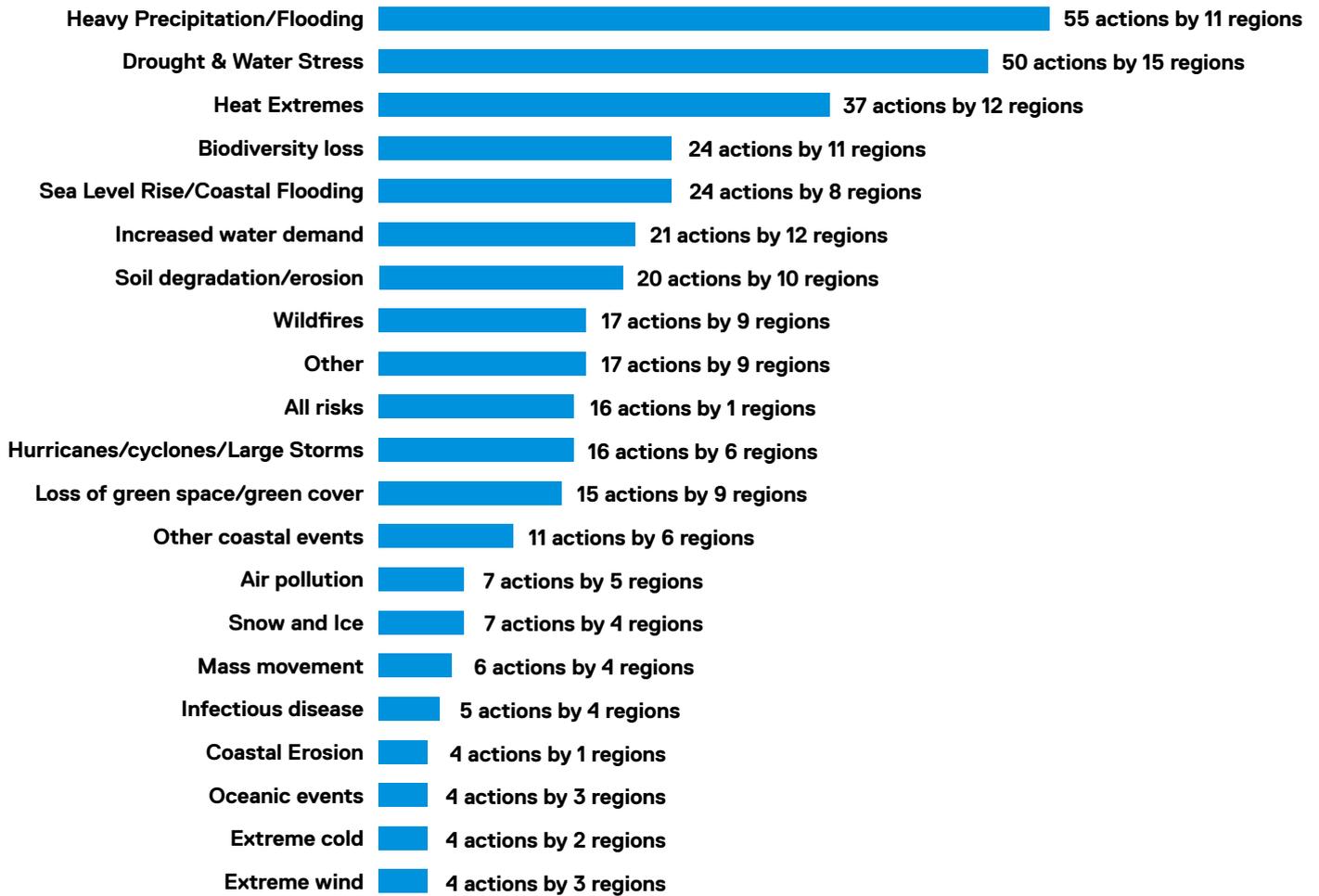
From risk assessments to action

222 adaptation actions reported in 2021

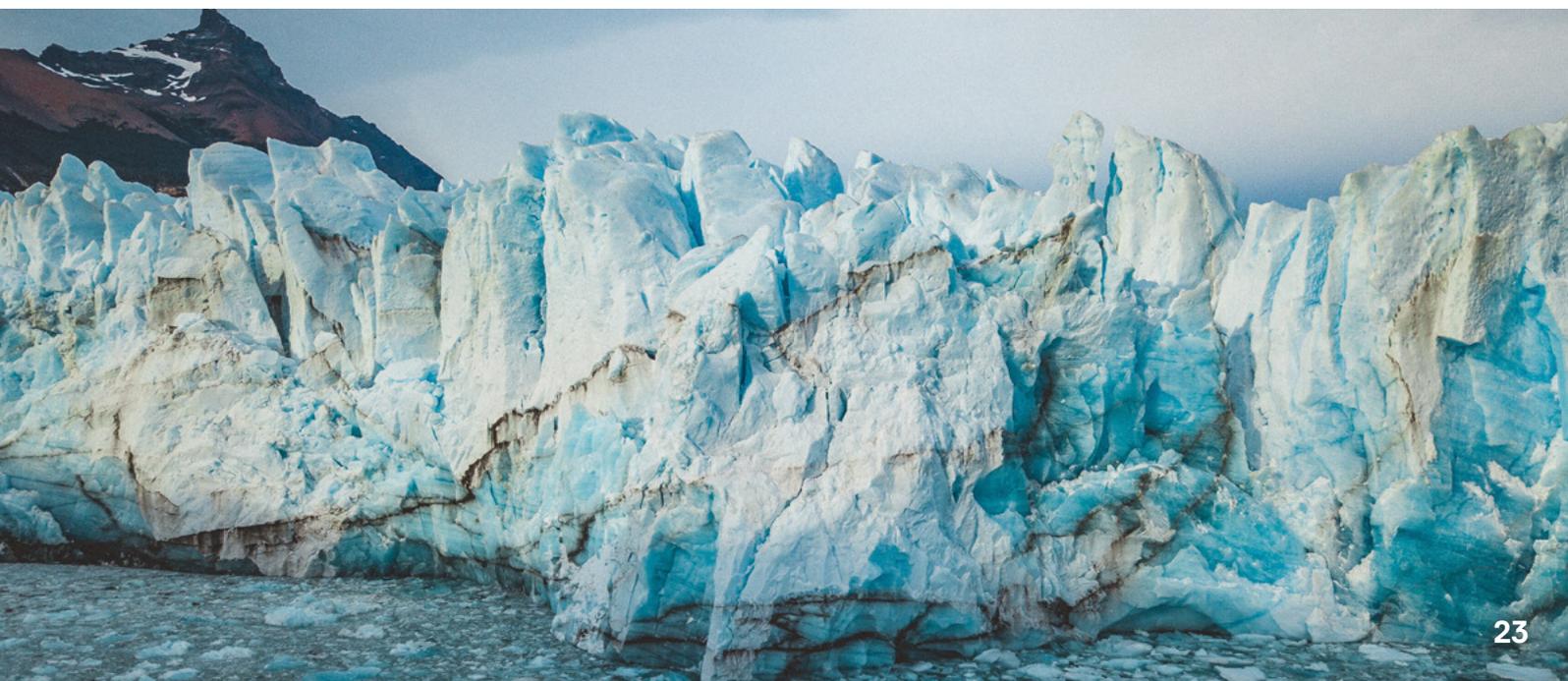


In 2021, 222 adaptation actions have been reported by 25 regions, addressing 222 climate hazards; 70% of actions are in operation or implementation, 14% are in preparation (scoping or pre-feasibility studies), while 10% are completed and/or monitored.

100 adaptation actions reported in 2022

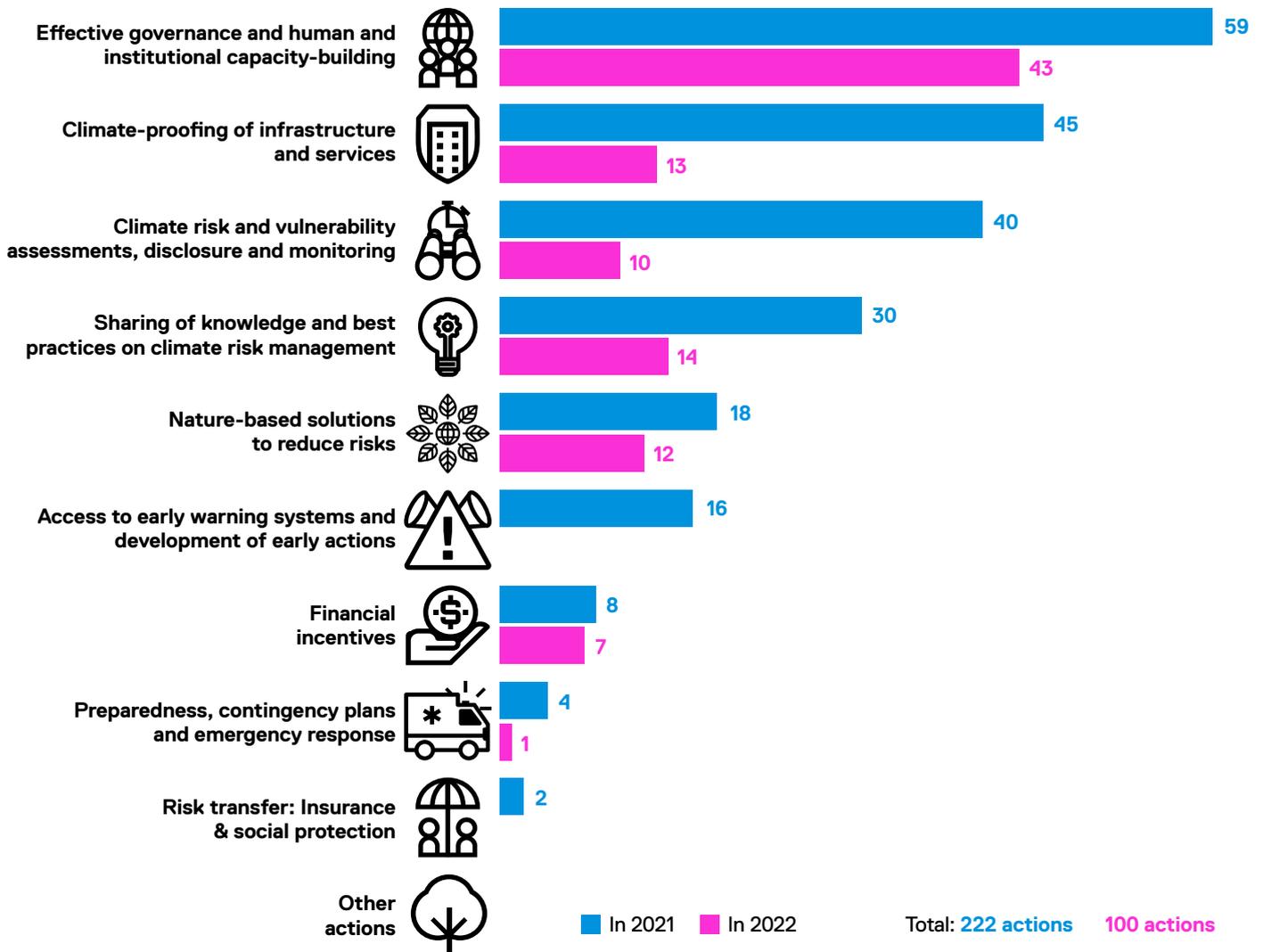


In 2022, 100 adaptation actions have been reported by 19 regions, addressing 364 climate hazards. This sharp decrease in the number of actions and increase in the number of reported climate hazards is due to a change in the questionnaire and methodology: unlike previous years where regions were asked to link actions to a single climate hazard, as of 2022, regions can now assign multiple climate hazard to a single action. [Discover the full list of 100 actions reported by our members in 2022 here.](#)



All these actions on adaptation for 2021 and 2022 have been classified according to the Race to Resilience framework, as shown below. The next sections focus on the actions undergone by members in 2021 and 2022 to address these 5 most reported climate hazards.

Number of actions per type of action



Heavy precipitation and flooding



When looking at **climate risk governance and capacity building**, priority is given to incorporating climate change into **long-term planning documents and land zoning laws** by British Columbia, Catalonia, Basque Country, Scotland and Wales. During 2020, the Catalan Water Agency has continued its works on the [Hydrological Program of the Flood Risk Management Plan of the Catalan River Basin District](#), updating the maps of flood danger as well as the zoning of the river area of the River Basin District of Catalonia by integrating climate change projections. The **Basque Country** has also included Climate Change in its “Basque Guidelines for Spatial Planning”, with a special emphasis in green infrastructure, urban regeneration and limiting

artificialization, elaboration of a municipal vulnerability, and risk index and inclusion of climate change adaptation and vulnerability index in one master plan. **British Columbia** is incorporating climate change into long-term planning documents and design of structural / non-structural flood mitigation projects. The **Welsh Government’s [National Strategy for Flood and Coastal Erosion Risk Managements](#)**, published in October 2020, aims to reduce the risk to communities from flooding and costal erosion which will be delivered through 5 objectives: improving their understanding and communication of risk; preparedness and building resilience; prioritising investment to the most at-risk communities; preventing more people becoming exposed to risk; and providing an effective and sustained response to

events. It sets out how to manage flood risk over the next decade and encourages more natural flood management, as well as greater collaboration to further reduce risk and create better, more sustainable schemes which deliver wider well-being benefits. In **Sud-Comoé**, actions are carried out for the socio-professional integration of young people and promotion of the green and circular economy, agro-ecology, waste recovery through the circular economy, and pilot actions for energy transition. This is to ensure a greater soil quality to face flooding risks. The creation of the Tanoé-Ehy voluntary nature reserve also provides training and funding for vegetable crops, environmental education on good agricultural practices, agroforestry, and ecological monitoring.



In terms of **climate proofing infrastructure and services**, climate change concerns are being incorporated into **building standards**: **Wales** is focusing on Building Regulations to cover resistance to moisture and is also mandating the use of Sustainable Drainage Systems (SUDs) from 2019 onwards. **Wales** is also developing a programme of bridge scour protection due to increased river flow, and in **Prince Edward Island**, an intensity-duration-frequency climate change (IDFCC) tool developed at the University of Waterloo is used to inform public infrastructure design. Emphasis is also

given to **water management**. In **KwaZulu-Natal**, water resource projects include: the construction of dams and the expansion of existing dams; waste water reuse feasibility and seawater desalination feasibility. **Santa Elena** is constructing new reservoirs, and due to the increased risk of diseases during floodings, is also developing testing/vaccination programmes. **British Columbia** is providing engineering design processes for promoting climate resilient infrastructures, such as highway bridges and culverts affected from increased flows. In terms of **flood defense**, **São Paulo** is working on water infrastructure

and flood control infrastructure, as well as is integrating telemetric network and operation of meteorological radar for real-time monitoring of rainfall in conjunction with the Civil Defense. Various programmes are being developed, such as the New Pinheiros River Program, a Sao Paulo-led initiative to clean up the Pinheiros River by 2022. In **Lombardy**, in 2021, with 9 million euros from the Recovery regional funds, activities of de-waterproofing and greening have started to eliminate the waterproofing substrate and planted vegetation.



When it comes to **climate risk and vulnerability assessments**, a strong focus is given to **flood mapping**: for instance, the **Basque Country** is developing a project in order to define current and future intense precipitation and modelling pluvial (hourly high storms) floodings. The climate change risk component is analyzed in fluvial flooding risk modelling system. In **Centre-Nord**, some communes have

developed flood maps and communities are made aware of the risks of settling in flood-prone areas. It can be also noted that a recent law has been voted by the National Assembly and therefore, has an impact on the whole national territory. In **Wales**, the flood mapping is publicly available through a dedicated website and improves preparedness for coastal and fluvial flooding risk. The flood risk mapping is in

the process of being updated to reflect all existing flood risk assets and will allow for current climate change projections. **British Columbia** is providing funding programs for local authorities and First Nations for hydrometric and hydraulic modelling as inputs to flood risk maps. **Prince Edward Island** intends to begin the development of province-wide pluvial flood maps.



In terms of **nature-based solutions**, **Pastaza** has carried out drainage to minimize the impact, increasing the vegetation cover, so that the roots of the plants can sustain the substrate on the banks of the rivers and slopes in order to maintain the normal course of the river and not cause overflows. **Goias**, **Santa Elena**, **Lombardy**, and **Wales** are all focusing on tree planting and the creation of green space. The 'Woodlands for Wales' programme of tree planting is underway to achieve several outcomes, including the reduction of soil erosion, slow water flows,

provision of shelter, and the improvement of connectivity for sensitive, native species to remain mobile. The scheme also provides training and skills development to local communities, creating opportunities to manage the land locally without the need to move or commute. In **Lombardy**, in 2021, 9 million euros from the Recovery regional funds have been focused for de-waterproofing and greening (eliminating waterproofing substrates and planting vegetation) under an agreement between the region and several municipalities. Last but not least, **Goias** is implementing various

projects, both at an institutional level. The [Juntos pelo Araguaias](#) project is the largest initiative for the revitalization of river basins in Brazil and aims to restore forest areas, preserve the springs, and conserve the quality of soil and water in the Araguaia River Basin. The SEDUC CERRADO planting campaign (2021) in the State of Goiás allows for the involvement of citizens, and the development of PlanteGo, a mobile application, encourages citizens to plant seedlings in urban and rural environments.



In terms of actions to address more extreme rainfall events, the most reported line of action is **early warning systems**. Regions such as **Santa Elena**, **South Australia**, and **Rio de Janeiro** have developed early warning systems. **Santa Elena** built help centers and prepared household preparation and evacuation plans. In **Catalonia**, the European funded project, [LIFE Baetulo](#), promotes measures to adapt to climate change in urban areas and aims to provide an innovative tool (an integrated and multi-risk early warning

system), that is both applicable and usable for any city or region prone to suffering from climate risks and with which the adverse effects of climate change can be predicted, including forecasting and the alert of all climatic hazards affecting urban areas. This pilot project is promoted from the city of Badalona with the aim of minimizing the exposure and vulnerability of its inhabitants, preserving urban areas and the environment. **British Columbia** is providing funding programs for local authorities and First Nations for hydrometric and hydraulic

modelling as inputs to flood risk maps. New investments in the River Forecast Centre will expand its capacity to play this important role in keeping communities and response agencies informed with the goal of improving our response to flood hazards. In addition, continued investment in the StormSurgeBC portal will provide timely information to coastal communities and emergency managers about potential coastal flood and storm surge events.

REGIONS IN ACTION: Empowering communities and businesses to face increasing flood risks in Scotland

Across **Scotland**, more intense rainfall in summers could bring heavier rainstorms with increased surface water flooding, while more frequent rainfall in winter could bring increased flooding from rivers. The Scottish Government has invested significantly in improving and supporting the continued development of Scotland's flood warning service, which will be increasingly important as our climate changes. This includes funding to help the Scottish Environmental Protection Agency (SEPA) and the Met Office operate [Scottish Flood Forecasting Service](#). This service ensures flood forecasting and warning information available to the public and emergency responders throughout Scotland. The service includes a daily Flood Guidance Statement and provides shared understanding of current and forthcoming flood risk levels and locations. SEPA also manages [Floodline](#), a direct warning service is available to the public and sends an alert to subscribers when their postcode is at risk of flooding. In order to support community empowerment, community volunteers are trained by the Scottish Flood Forum and the Conservation Volunteers. Volunteers are then equipped by the local authority to assess watercourses, report blockages to the local authority, and maintain priority watercourses themselves if safe to do so. This novel approach enables communities to improve their resilience to respond and recover from flooding.

Extreme heat events (more hot days, hotter summers, & heatwaves)



When it comes to **climate risk governance**, the **Catalan** Public Health Department created the [Climate Emergency Response Program](#) to minimize the effects of hotter days and their associated risks on people's health. **Québec** is leading programmes to address side-effect diseases

resulting from hotter temperature, such as a pollen reduction strategy and integrated pest management programs. In **South Australia**, the government established the Green Adelaide statutory board in July 2020 with a vision to create a cooler, greener, wilder, and climate-resilient Adelaide. A

number of initiatives were delivered, such as the Urban Tree Canopy Off-set Scheme that was introduced in March 2021 to facilitate tree planting and the enhancement of tree canopy in metropolitan Adelaide.



In terms of **heat risk assessment**, in **California**, CalEPA has conducted [heat island mapping](#), and developed the [California Heat Assessment Tool](#) (CHAT) that maps heat. In **Campeche**, the Ministry of Environment, Biodiversity, and Climate

Change (SEMABICC) has a centre to monitor hot spots. It has been used to detect forest fires in a timely manner and to take action to address them in coordination with the three levels of government. **Québec** is developing the use of [tools facilitating](#)

[invasive alien species \(IAS\) identification](#), detection, and recording by a range of individuals and partners (including citizen scientists), validate and analyse the data collected, and combine with other tools and databases to prioritize actions on IAS.



Sharing knowledge & best practices is one of the key areas of action when it comes to addressing extreme heat, notably when it comes to health and [disease prevention measures](#). In **California**, the Department of Pesticide Regulation provides work-safety resources to County Agricultural Commissions, including heat-related illness prevention with employers during summer months. In the **Basque Country**, the relation between heat waves, air quality, and morbidity/

mortality is under research in order to include these events in emergency prevention systems. On [stakeholder engagement](#), in **Cross River State**, feasibility and scoping studies are being conducted on stakeholder engagement to generate cost effective adaptation measures. In addition, considerable activity has taken place in recent years in **Wales**, with the Welsh Peatland Action Group, to bring all stakeholders together. It has facilitated and coordinated successful Sustainable

Management Schemes (SMS). As for [community engagement](#), **Sud-Comoé** intends to create an ecological school and community forest. In **Jalisco**, work has been done with the State Health Secretariat in the preparation of an informative brochure to communicate prevention actions against natural phenomena and respiratory, gastrointestinal, cardiovascular, and vector-borne diseases, as well as preventative actions.



As for **nature-based solutions**, **California**, **Campeche**, and **Centre Nord** are all reforesting and creating green spaces to counter the effect of increased temperatures in both public and private spaces. In the **Basque Country**, some pilot projects and municipality strategies have been developed to protect populations

from heat waves through nature solutions in urban planning, parks, roof plazas. Some guidelines have been edited to introduce nature-based solutions in urban sites and good practices have been developed for municipal adaptation. In **Cross River State**, the aggressive replanting in degraded forest reserves, community forests, and

marginal lands of both forest tree and food/economic crops has led to reducing incessant outbreak of wildfires, as well as achieving fuelwood, food, and water security, water shed protection, & reducing desert encroachment.



Other actions that were mentioned were, for instance, incentives from **Prince Edward Island** for energy-efficient heating and cooling equipment through the [EfficiencyPEI](#) programme. Early warning systems from **British Columbia**, such as

a heat wave alert, have been developed in select areas to alert the public and trigger municipal heat response plans. In **Québec**, they are testing a telephone alert system for vulnerable groups, and in **Lombardy**, in the areas that are most

affected by the increase in temperatures, i.e. the mountain and the glacier areas, new economic reference models and orientation mechanisms are being developed to “adapt” tourism development projects and actions for the management of winter tourism.

REGIONS IN ACTION: California’s whole-of-government approach response to extreme heat

To mitigate the risk extreme heat events, pose to every corner of the State of California, the state developed Protecting Californians from Extreme Heat: A State Action Plan to Build Community Resilience in 2022, an all-of-government approach outlining established resources and investments and recommended new measures for further action. The Action Plan identifies six areas of near-term focus for state action informed by extensive public input, assessments of federal, local, and community heat action, and analyses of gaps in established resources. By setting a strategic direction for expedited action, California has been able to move ambitiously on strengthening resilience to extreme heat across communities and ecosystems. This includes increasing public awareness and supporting heat-emergency preparedness through the upcoming development of a first-of-its-kind heatwave ranking and notification system signed into law by Governor Gavin Newsom in the summer of 2022, and supporting all levels of decision-makers in long-term adaptation to more frequent and severe heatwaves through the Governor’s Office of Planning and Research’s Extreme Heat and Community Resilience grant and technical assistance program for community, local, and tribal planning, investments in community resilience centers across the state, and increased funding for nature-based solutions and urban greening grants.

Drought and water stress



In terms of **climate risk governance**, in **Lombardy** and **Rio Grande do Sul**, the climate change issue is incorporated in a [long-term planning document](#). In **Lombardy**, for instance, climate change is deeply integrated in several regional planning instruments and one of these is the Water Protection Plan, the qualitative and quantitative protection of water. Several measures are being planned and will be partially implemented with co-benefits for climate and water management. The State of **California** manages many grants and programs to increase regional planning and coordination, improve self-reliance, diversify local water

supplies, and increase water use efficiency. In **Wales**, Water Resources Management Plans are in place. These are adequate for adapting to 2050 medium scenario projections of climate change. The Water Act 2014 requires water companies to plan for drought in their business plans. Leakage rates have dropped since 1995. In **Campeche**, with the support of GIZ, participatory workshops are currently being held with different stakeholders to begin the process of updating Forestry Law, which aims to harmonize it with the Climate Change Law, including forest sustainable use, community management, and the reduction of illegal logging. The government

of **KwaZulu-Natal** anticipates possible risks through restricting urban development in areas at risk. The Municipal System Act and Disaster Management Act requires disaster management practitioners to identify areas of risk, which involves monitoring where and what investment or developments are in planning and ensuring that they are not over flood plains. In **Lombardy**, the strategic under-basin plan and the new River Contract of Seveso River Action Plan consists of implementing local actions within the Seveso River Basin in order to increase water quality and protecting water habitats in densely populated areas with severe environmental impacts.



Diversification of water supply is one of the most explored lines of action when it comes to **climate proofing infrastructures and services**: in the State of **California**, the Water Resources Control Board's Storm Water Strategy incentivizes state-wide use and redefines storm water as a resource, which results in local storm water management that produces multiple benefits. This will contribute to the diversification of local supplies through different strategies, including the replenishment of depleted groundwater aquifers, increased storm water use for local irrigation and non-potable water demands, increased flows in local streams and rivers, incentives for

regionalization of local utilities, increased regional and local community partnering, increased grants to implement Low Impact Development designs within parking lots, alleys, and street, and joint-involvement in regional and local water resource management. Some states in Brazil are carrying out many actions to increase the diversification of water supply. For example, in **Ceará**, they are building cisterns, dams, and conduits to store water and transfer it to drier regions while the State of **São Paulo** also increases the resilience of its water supply system through the implementation of inter basin transfers. Apart from diversifying its water supply, **Santa Elena** also works on improving its water supply

distribution method. **Rain and Storm water capture** systems are also another explored solution, with numerous projects throughout the state of **California**. The State Water Resources Control Board, the Department of Water Resources, and other states and local land use agencies continue collaboration to prioritize stormwater capture and infiltration. In **Guanajuato**, through the Climate Change Prevention Programme, rainwater harvesting systems are implemented with a focus on potabilization in households and schools. In 2019-2020, 193 systems were installed benefiting 913 people in the municipalities most vulnerable to water scarcity.



In terms of **climate risk and vulnerability assessments**, **Québec**, the **Basque Country**, and **Rio de Janeiro** are taking water availability

reduction into account in their hydrologic planning cycles and water monitoring network. The Basque government focuses on better on-time river flows metering, and

Québec is developing a Tool to evaluate surface and groundwater water availability for additional water usage considering climate change projection.



Promoting and incentivizing water efficiency is also an important way to reduce the vulnerability to droughts, which can be done through public awareness campaigns, as carried out in **Québec**. This work is also complemented by Water Use Audits through a research project on integrating the impact of climate change in analysing the cumulative impact of water collection. In **British Columbia**, based on recent research to better understand weather related needs of agricultural producers, the Province will work with agricultural producers and experts to prototype and test a customized

decision support tool that will help achieve a more efficient use of water for irrigation and crop growth. It will be further supported through the Extreme Weather Preparedness for Agriculture program and the Agricultural Water Infrastructure program. Funding provided through these programs will support initiatives including farm-level climate risk assessments and the adoption of practices that reduce a farm operation's vulnerabilities from extreme heat, wildfires, and flooding. The **Basque Country** promotes water efficiency through the renovation of the water supply infrastructure, the grouping of water supply

agents, as well as the review of taxes and measures to raise awareness. **Jalisco** and some intermunicipal environmental boards are implementing Sustainable Agriculture and Production Initiatives (IAPS), which seek to strengthen the technical capacities of agricultural producers. They also are working to disseminate initiatives in which soil and water conservation works in the upper parts of the micro basins are being considered as adaptation measures for events such as longer heat waves, droughts, and torrential rains.



As **access to finance** is often key to effectively delivering actions, **California** is currently implementing diverse actions in this way: there is a proposition to allocate \$260 million to the Clean Water State Revolving Fund Program's Small Community Wastewater Grant Fund to assist small disadvantaged communities in addressing their wastewater needs. The State Water Board administers drought-related emergency grants and

loans for drinking water and assists in identifying and permitting alternative water supplies for public water systems anticipating severe shortages or water outages. Funding approaches prioritize disadvantaged communities and low-income households. There are also various grant programs, including the CAL FIRE Forest Health Program, the CAL FIRE Fuel Reduction Project Grants, and the Wildlife Conservation Board of the Forest

Conservation Program, which incentivize activities that increase resilience to climate change. Both programs provide funding to implement prescribed fire which helps reduce the risk of high-severity wildfire, and to protect forests, which can help ensure habitat connectivity and safeguard migration corridors for species impacted by climate change. These programs also protect upper watersheds where the state's water supply originates.



Other projects include tree planting and the creation of green space in **Goias**, changing agricultural patterns in **Sud-Comoé**, and working on crisis management, including warning and evacuation systems in

Centre Nord. In **São Paulo**, the Nascentes Program combines the conservation of water resources with the protection of biodiversity through an innovative institutional structure. In June 2022, 26,458

total acres were restored. There were also 2000 hectares of projects ready, defined, and awaiting resources for implementation.

REGIONS IN ACTION: South Australia's water management

The **South Australian** Government has a comprehensive water planning, licensing, and management system which manages limited water supplies and fights water shortage through a series of different measures: diversifying water supplies (desalinated water, recycled water, storm water capture), promotion of Water Efficiency Labelling and Standards, implementation of Water Sensitive Urban Design (WSUD), and changes in irrigation and farm management practices. An Urban Water Directions Statement has also been released which outlines priorities and management principles that will inform future water infrastructure delivery, policy settings, and organizational arrangements. The development of guidance materials to assist in the integration of climate change and adaptive pathways into water allocation planning is underway. A consortium, led by the University of Adelaide and the Department of Primary Industries and Regions (PIRSA) was awarded \$8 million Australian dollars over four years to establish the [South Australian Drought Resilience Adoption and Innovation Hub](#). This is a partnership between primary producers, industry groups, researchers, government agencies, universities, agribusinesses, traditional owners, and others, with a common vision to strengthen the drought resilience and preparedness of farms and regional communities in South Australia.

Coastal Erosion



An important focus regarding **governance** is to better **organize the coastal land use**, taking into account the climate change risks: the Government of the State of **Ceará** is elaborating a Coastal Zone Ecological-Economic Zoning which has among its objectives to organize the occupation of the coast, reducing the impacts that coastal erosion causes to the environment and to the population living in this region. **Prince Edward Island** has

historically required a horizontal setback for coastal development based on historical rates of erosion. Opportunities for further restrictions based on the likelihood of increasing rates of erosion are being explored. Historical erosion rates were last updated in 2010. PEI plans to update a coastal change study completed 10 years ago using new aerial images to inform coastal development setbacks. In **Québec**, an important research project on coastal

vulnerabilities and resilience in the St-Lawrence estuary and gulf is undergoing. The objectives of this project are to support municipalities, to develop planification tools for territorial planning, and to reduce the vulnerabilities of communities and ecosystems. An important result from this project will be the proposition of suitable adaptation solutions for different stretches of coast.



Regions are also **adapting and testing innovative infrastructures**. Prince Edward Island installed an innovative inter-tidal reef, which improves the resilience of the beach and dune system and protects the Souris Causeway. Due to positive results, this approach is being tried in other locations. The province has also supported the development of a living shoreline through the Climate Challenge fund. In California, Caltrans is realigning and siting new roadways to avoid areas affected by sea

level rise, storm surge, and coastal erosion. São Paulo is testing in different areas 'Geobags', by creating submerged barriers by burying geotextile bags perpendicularly to reduce wave energy. After a first 3 years pilot implemented in 2017 in Santos, 32 new bags are in place for testing in Balneário Araçá since 2021. In Catalonia, the Horizon 2020 [Impetus Project](#) of coastal resilience adaptation promotes demonstration solutions and demo sites that increase adaptation to the Catalan coast in the face of the impacts of climate change. The aim

of impetus is to be able to integrate these demonstration solutions into a global strategy for the protection of the entire Catalan coast. In Wales, the priority is given to improving defences, but also to improving the management of land and water across a catchment to reduce run-off, intelligent planning, retrofitting of towns and cities and in some cases, creating space for water and recognizing the need to move out of harm's way. The full list of measures is available in the [National Strategy for Flood and Coastal Erosion Risk Management](#).



Assessing coastal risks is a priority. The working group between the Catalan Office for Climate Change, the Meteorological Service and the Cartographic Institute of Catalonia aim to assess coastal vulnerability to climate change and develop an adaptation strategy in concordance with the PIMA Adapta Costas Plan, a national project financed by the Ministry of Ecological Transition of the Spanish state. Since 2020, they are working on studies and preliminary works on climate projections and collecting data. Prince Edward Island is working on identifying and assessing provincially owned roads, bridges, buildings, and other critical assets that are vulnerable to erosion

and flooding, to encourage asset managers and decision-makers to further explore identified vulnerabilities, and to take action to develop adaptation strategies for at-risk assets. Over 700 properties with critical infrastructure assets (both public and privately owned) were assessed in 2021-22 with respect to coastal flooding and coastal erosion hazards. Québec prevents risks associated with coastal erosion by developing maps and sharing coastal erosion and submersion risks. São Paulo updates its [Coastal Erosion Risk Map](#) every 5 years, which presents a synthetic overview of coastal erosion along the coastline, as well as points out the main challenges and future needs for effectively tackling the problem

and develops prototypes of a warning system for coastal erosion and anomalous high tides (coastal flooding) for each coastal sector of São Paulo (automated and integrated with the state Civil Defence system). These are then made available online. In 2020, Wales published its [National Strategy for Flood and Coastal Erosion Risk Management](#), which sets out how it intends to manage the risks from flooding and coastal erosion over the next 10 years. The strategy promotes continuous improvement of modelling, mapping, and flood data to better understand the flood and coastal erosion risk which would lead in adapting in an intelligent and robust way.



When **sharing knowledge & best practice on coastal risks**, a webinar was organized in Catalonia on December 2020 to discuss about European deltas and climate change, which presents the virtual exhibition "[The Ebro Delta and climate change](#)". São Paulo has developed a Coastal risk communication platform

([RedECOST](#)) to stimulate the mobilization and organization of different local actors through an agenda of inclusive, equitable, and quality education to disseminate knowledge about coastal dynamics, coastal risks, and climate change impacts, as well as increase the resilience of coastal populations and decrease vulnerability to

coastal risks. In Sud-Comoé, a very strong advocacy with the State is going on for the opening of the mouth of the Comoé River and the sea at Grand-Bassam and contribution to the sensitisation of the population, particularly in Aboisso, to avoid occupying areas at risk along the Bia River.

REGIONS IN ACTION: Prince Edward Island facilitating information on coastal hazards

Over 58,000 properties across the Island are in the coastal area. The [Coastal Property Guide](#) helps coastal property owners understand their current and future climate hazards. [The Coastal Hazard Assessment \(CHA\)](#) is a free service that provides property-level information to current and prospective property owners on present-day and future erosion and flood hazards. Anyone can request this information on any property. This information is provided to everyone requiring subdivision or development approval within provincial planning jurisdiction. Twice as many assessments were completed in 2021-22, compared to the previous year, reflection increased awareness and demand for this service.

Sea level rise



In terms of **climate risk governance & capacity building**, the **Basque Country** has started a multiannual and multilevel project with the aim to evaluate the impact, exposition, and risks in the whole Basque coast to measure sea level rise, sea waves, and precipitation conjunction. In **California**, many of the state's agencies are working to address the impacts of sea level rise and have

recently adopted environmental justice and equity policies and guidelines and are now working to implement them. In Jalisco, the Municipal Climate Change Programme of the Municipality of Puerto Vallarta in **Jalisco** (coastal municipality and main tourist destination in the state) is being developed. The Programme, which is about to enter the public consultation phase, will address the rise sea level.

South Australia's Coast Protection Board provided guidance and direction to councils and other stakeholders on the sustainable use and development of the coast, including advice on protecting against coastal hazards. They administer grant programs to support the design and construction of coastal council protection works.



In terms of **infrastructure**, **British Columbia** is dabbling in engineering and planning guidance on sea dike design and coastal development to help enable

communities and qualified professionals to protect people, buildings, and infrastructure from sea level rise. **California's** coastal zone management agencies are working

to address sea level rise with innovative nature-based flood protection projects with the support of the State Coastal Conservancy Funds.



Regional governments are implementing a number of actions to better understand the threat of sea level rise. In **California**, the San Francisco Bay Conservation and Development Commission does the modeling for the San Francisco Bay. [The Coastal Resilience Project](#) is a global network of practitioners who are applying an approach and web-based mapping tool designed to help communities understand their vulnerability from coastal hazards, reduce their risk, and determine the value of nature-based solutions. In **Québec**, the government is modelling sea level rise and studies its impact on coastal submersion and erosion. The government of

KwaZulu-Natal is currently assessing the relative coastal vulnerability in its territory to identify areas of high risk, infrastructure at risk and communities that would be most adversely affected by sea level rise. Another way of adapting to the rising sea level is to restrict development in at-risk areas, like the government of **KwaZulu-Natal** is doing through the establishment of a coastal set-back line has been defined, which prohibits or restricts the building, erection, alteration, or extension of structures that are wholly or partly seaward of the setback line. **Prince Edward Island** launched new coastal flood maps in 2021-22. The PEI Coastal Hazards Information

Platform (CHIP)⁵ is an interactive map that users can browse to visualize areas at risk of coastal flooding caused by combinations of sea level rise, tides, and storm surge now and in the future (i.e., 2050 and 2100). In 2022-23, the province intends to add water depth information to the new coastal flood maps. This will better inform users on the extent of potential water damage in flood hazard zones. In **South Australia**, the Coast Protection Board continues to invest in key data to refine the identification of coastal hazards, flood mapping, as well as to identify and protect priority coastal ecosystems.

REGIONS IN ACTION: Preparing for rising waters on the Basque coast

More than 65% of the Basque population lives in coastal areas. Therefore, an analysis of coastal risk due to rising sea levels and waves (kostaegoki) has been carried out and the adaptation of the coastline to climate change has been defined as one of the priorities of the Basque Country (Spain) within the LIFE European project [Urban Klima 2050](#). In urban areas, video-monitoring systems and weather forecasting systems are implemented to prevent risks in coastal areas and to integrate the new information into risk prevention plans. A pilot project in Zarautz focuses on its promenade, with the idea of reducing the impacts of the combined effect of waves and tides on it. In 2021, a "Study of alternatives for action in rigid environments on the Zarautz beach" was carried out, and a second initiative is ongoing to analyze the impact of climate change on energy infrastructures.

COMMITMENT 4: REPORT ANNUALLY ON PROGRESS

When joining the RegionsAdapt initiative and Regions Race to Resilience, regional governments commit to report annually on their progress through the online CDP States and Regions Questionnaire to inform and improve policies and actions.

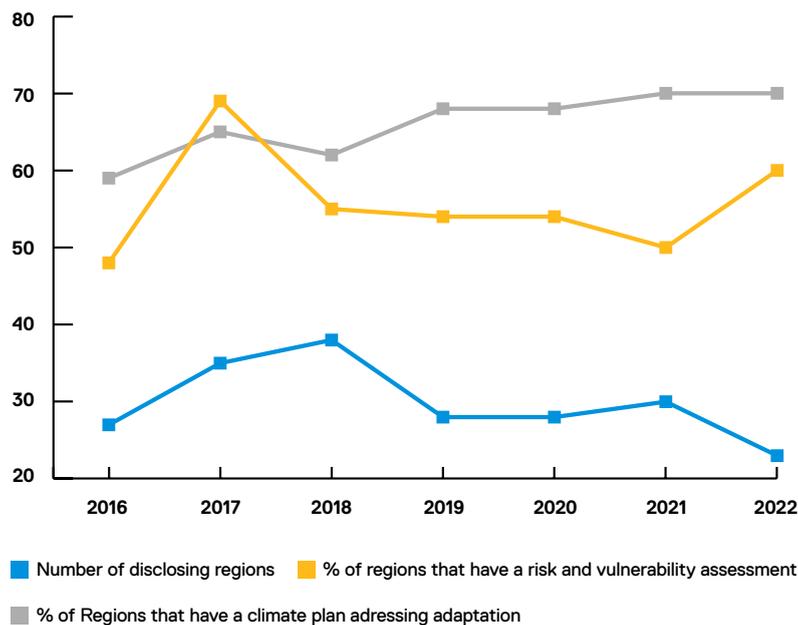
Reporting annually as part of RegionsAdapt commitments

Since 2015, through RegionsAdapt and CDP's efforts in inviting regional government to fill in the State and Regions Questionnaire, more than 50 different regions have reported, demonstrating transparency and accountability for their climate actions. However, the frequency

of this reporting can be irregular, as some regions run out of steam and do not participate annually.

Since RegionsAdapt joined the Race to Resilience in 2021, this is a new opportunity to re-launch the momentum and encourage all RegionsAdapt members to report

regularly, in order to demonstrate to the international community, especially at the UNFCCC Climate Conventions, the progress made year after year. This 2021-2022 edition is the first edition whose data will directly contribute to the Race to Resilience.



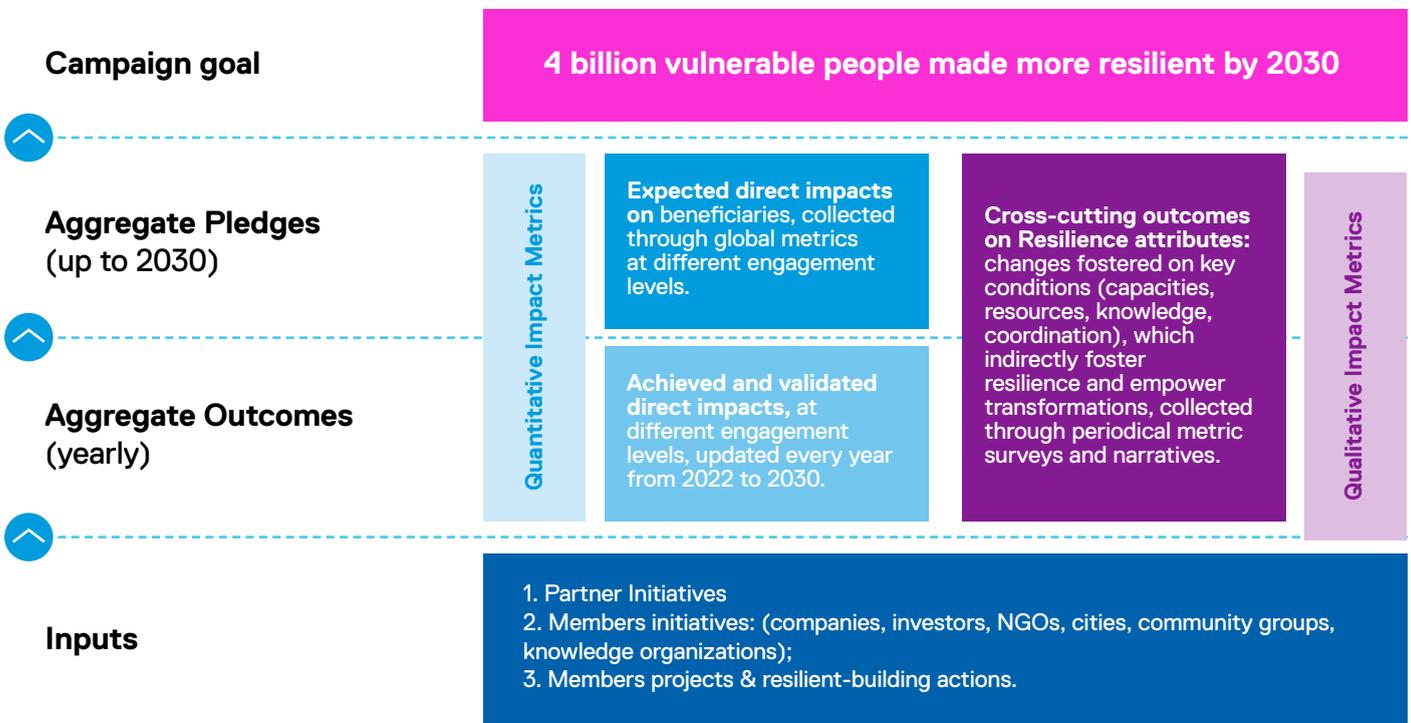
Reporting back to inform the Race to Resilience

Race to Resilience’s ultimate goal is to promote actions that foster an ‘increase’ in the resilience to climate change. To understand how non-state actors are progressing towards this goal, to identify what works and what doesn’t, and to monitor and evaluate its partners, the Campaign needs a form to measure ‘increased resilience’, that is, the impact of its partner’s action on raising the resilience of their beneficiaries to climate change.

For this, it adopts a **dual approach** that combines:

- ‘**quantitative**’ metrics focusing on how much resilience is created, measured by the **number of ‘individuals’ benefited** by the actions of R2R partners;
- ‘**qualitative**’ metrics focusing on understanding how this resilience is created, by seeing how it sets forth

changes on properties that are commonly associated with resilience. This is what is called ‘**resilience attributes**’. Seven resilience attributes were defined as key conditions that are acknowledged to foster resilience or empower resilience-driving transformations: Preparedness and planning, Learning, Agency, Social Collaboration, Equity and Inclusivity, Flexibility, and Assets.



Source: Working Paper #1 R2R’s Metrics Framework, August 2022.

The CDP States and Regions Questionnaire has been adapted in 2022 to integrate the quantitative metrics of this framework defined as the ‘Proportion of the total jurisdiction population with increased resilience due to adaptation action (in %)’. However, due to the novelty of this approach, and the difficulties of reporting

progress on adaptation at a regional level (see below), only half of the regions (56%) have provided information on the quantitative impact of their actions, thus quantifying **24 of the 100 reported actions. According to first estimates, these 24 actions have a total impact on over 58 million people.**

Regarding the qualitative metrics defined through resilience attributes, discussions are ongoing to strengthen the alignment between the CDP States and Regions Questionnaire and the Race to Resilience framework.

Reporting progress on adaptation at regional level, an ongoing challenge

In recent years, funding and initiatives for climate change adaptation have grown exponentially, making monitoring and evaluation of adaptation progress increasingly important. Despite its importance, there is a marked absence of indicators or ways to measure adaptation implementation, in contrast to mitigation where evolution is measured through greenhouse gases emissions indicators. Fortunately, interest in monitoring adaptation is growing in the research and policy community, and different ways of measuring progress in implementing adaptation at the regional level, especially in high-income countries, are beginning to emerge.

Regarding progress in monitoring and evaluation processes for adaptation to climate change, there are still great differences among regions. All European, Canadian, and Australian regions report having a monitoring or evaluation process for their adaptation plans, but it is the case for only 3 out of 11 Latin-American regions, and no African regions reported on it yet.

As data reveals, the **Basque Country, Catalonia, Prince Edward Island, Québec, Rio Grande do Sul, Scotland, and South Australia** all report monitoring progress of

their adaptation plan in their annually public reporting, and some regions are currently considering developing metrics to quantify progress in adapting to climate change.

For instance, **Catalonia** has a [Global Adaptation Indicator](#) to monitor progress that was created in 2014 and revised in 2018. This global indicator, made up of 42 sectoral indicators, and taking 2005 as the base year, allows observing how adaptation to the impacts of climate change has evolved. For example, thanks to this global indicator, the 2017 monitoring report of the Catalan Strategy for Adaptation to Climate Change (ESCACC) concluded that adaptation had improved by 8.5%.

Québec annually updates its climate change implementation document and has already worked on a general framework for monitoring climate action with pre-identified indicators to assess the effects of government programmes and interventions in terms of adaptation. They are currently assessing the feasibility and relevance of the indicators. A working team of 23-people within the Ministry of the Environment who are currently developing a dashboard to monitor the 166 actions and sub-actions of their Adaptation plan through specific indicators.

Flanders regularly evaluates and reviews its climate strategy in biannual reports. A study was carried out two years ago to define indicators to establishing a monitoring system on climate change and adaptation. The next step of that process is now being planned to choose some of the indicators that were proposed in the previous study. In doing so, they aim to move forward by replacing their current biennial report on adaptation progress with an indicator-based process.

In **Lombardy**, great importance is also given to monitoring. In the 9/2020 law, a commitment was adopted to follow the monitoring process for each measure. However, regions indicate that monitoring should also be applied to the entire climate program or plan, not only to the measures that comprise it. A climate change law is being planned right now, and it is expected that the progress of Lombardy's action plans can be monitored, evaluated, and reported thanks to it.

CONGOPE has its own monitoring process, designed through international cooperation, which mainly address monitoring ecosystem degradation.

REGIONS IN ACTION: Monitoring Wales's climate adaptation plan

Wales (UK) latest adaptation plan, Prosperity for All: A Climate Conscious Wales, has a number of general goals for which they have developed a Monitoring and Reporting Framework and follows recommendations made in studies into evaluating climate change adaptation by Power, et al. (2018) and Russ, et al. (2018). A central approach of this work has been, for each of the actions in the adaptation plan, to use a 'theory of change' approach to understand what is intended by each action – and therefore determine the best way in which to monitor and evaluate progress. The following questions were used to understand what change was intended through each action: • What are the outputs from the proposed action? • What is the desired outcome/impact/change resulting from the action? • How does the action reduce climate risk/vulnerability? • What indicator, baseline, narrative or measure might best monitor and evaluate progress for each action in the Climate Change Adaptation Plan for Wales? [More info here.](#)

THE WAY FORWARD

As reflected in the CDP data and the qualitative interviews supported by BC3, governments have increased their efforts in adaptation in recent years, mainly forced by their need to respond to the harsh consequences of climate change impacts and increasing extreme weather events that they are already suffering.

Many regional governments have been taking adaptation forward by identifying adaptation opportunities and co-benefits more easily. They have improved their instruments, thanks in part to improved knowledge and coordination, and have developed increasingly vulnerability assessments, trying to target and include those more vulnerable.

However, this progression has been uneven across regions, creating a gap between industrialised regions on one side, and middle- and lower-income regions on the other side, even though the latter suffer most from the impacts of climate change. Industrialised and high-income regions are the regions with the longest adaptation path (with some high-income regions in the process of developing or even implementing their second adaptation plans or strategies), while regions from the Global South have recently implemented or are in the process of developing their first plan or strategy. Unfortunately, some regions with fewer resources, which also seem to be most vulnerable to climate change threats, still lack the funding and expertise to be able to start the process.

When looking at the main obstacles, middle- and lower- income regions reported facing higher barriers to adaptation than high-income regions. Technical and institutional barriers are the most common obstacles, closely followed by financial and regulatory barriers. There are other types of barriers related to the perspective of social and political actors which hinder progress in adaptation, such as the relationship between the scientific and political spheres, collaboration between different ministries and levels of governments, social awareness, and the lack of attention to adaptation issues compared to mitigation action.

As stated in the last IPCC report, evidence of observed impacts, projected risks, levels and trends in vulnerability, and adaptation limits, demonstrate that worldwide climate resilient development action is more urgent than previously assessed. This urgency calls for short-term adaptation actions in the context of long-term planning to reduce the overall vulnerability of societies and territories. Efforts must be global, involve all levels of government, and be accelerated through the following actions:

✓ Develop risk and vulnerability assessments and systematically use them to inform adaptation policies and actions.

More data driven information and territorialized analysis of climate impact helps with political decisions and public awareness. Many regions have underlined the use of information and data as an important progress in developing and implementing tailored and fit-for-purpose adaptation plans and actions, and that guaranteeing flexibility of plans and policies to adapt to evolving data, is key as well to ensuring evolving and informed adaptation plans and actions. Nonetheless, other regions, especially in Africa, have reported that data is still missing due to lack of fund and adequate expertise. Overall, there is also the need to make a greater use of the findings of these risk and vulnerability assessments to better inform and orientate policies and actions. Although the production of climate science has grown, its usefulness in decision-making and policy-making remains relatively limited.

✓ Identify and target vulnerable populations in risk assessments and adaptation planning.

This report has highlighted the gap between the harsh realities already faced by vulnerable populations and their lack of inclusion in assessments or planning. Risk assessments should be an opportunity to help identify and target the most vulnerable. Adaptation policies provide an opportunity to address social justice. Special attention must be focused on the resilience capacity of low-income households, elderly and vulnerable health groups, minority communities, children and youth, women and girls, and outdoor workers.

✓ **Favour the use of instruments for adaptation that have a proven track of success,**

such as climate public policies, projects, regulations, legislation and training. There has been progress on regulation and legislation worldwide, with many regions having, or being in the process of developing specific climate change laws, or adapting existing laws to increase resilience. This has proven to be quite efficient in raising the priority of climate change in the political agenda, even though the resulting regulatory processes, when cumbersome, may delay their effective implementation. Increasing public awareness and training on climate change is also a strong driver of adaptation. The creation of training modules on climate change, both for the general public and for decision makers, is particularly welcome; as it facilitates the dialogue between science and policy, which has been one of the barriers reported during interviews.

✓ **Enhance multi-level governance.**

Regions state that, although the implementation of Nationally-Determined Contributions (NDCs) seems to induce increased collaboration between national and regional government, coordinating with national levels around climate change policies is quite complicated, and sometimes, they do not even have mechanisms in place to ensure it. On the other hand, even though coordination within the local level is easier, horizontal governance and multi-stakeholder governance needs to be reinforced. Stronger cooperation and integration across local, regional, national, global levels is required for instance in the field of data access. National support to subnational governments is needed to systematically access data, while integrating regional data, knowledge and information into global and national platforms to shape multi-level data driven and science-based policymaking.

✓ **Underline the opportunities and co-benefits that adaptation can bring.**

Raising awareness of the opportunities and co-benefits that taking adaptation measures brings makes it easier for policymakers to include adaptation measures in the development plans, recognizing adaptation measures as win-win policies, and thus encouraging their adoption.

✓ **Facilitate access to funding for climate adaptation at the regional and local levels,**

(such as environmental funds, national budgets, and international or European funding), is key to addressing adaptation action, especially in low- and middle-income regions. A general trend observed is that resources received from national budgets are scarce in comparison to the region's own resources. Although some high-income regions have the opportunity to try different financial mechanisms (taxes, carbon credit, grants, loans, repayments, etc.) that allow them to create new financial resources dedicated to climate change, most lower income regions still struggle in accessing financial resources. This confirms the need to call on parties and financial institutions to make climate finance mechanisms for decentralized governments, especially for African regions more available, transparent, and accessible.

✓ **Mainstream adaptation in other sectors:**

Adaptation to climate change is a crosscutting issue that affects all socio-economic sectors, so it requires a stronger collaboration between different ministries as well as that the sectoral policies, plans and budgets take adaptation into account.

✓ **Develop monitoring, evaluation, and reporting processes,**

which are of great importance in the regions, yet remain a big area for improvement. Some industrialised regions have developed concrete measuring methods with different levels of sophistication to assess the success of adaptation actions implemented in the region. However, indicators for monitoring are not very common as there is no global consensus on monitoring, evaluation, and reporting on adaptation. The current trend, as expressed by the regions, is to create adaptation progress indicators to study how much progress has been made through the measures stipulated.

✓ **Be part of a network.**

Regions involved in either international-, regional-, or national- networked initiatives benefit from peer learning, exchange of knowledge and best practices, which further foster a multi-level governance approach, facilitate cooperation opportunities and help replicate innovative practices.

Acronyms

BC3 – Basque Centre for Climate Change
CAL FIRE – Department of Forestry and Fire Protection (California)
CCRA - Climate Change Risk Assessment
CHA – Coastal Hazard Assessment
CHAT – California Heat Assessment Tool
CONGOPE - Consorcio de Gobiernos Autónomos Provinciales del Ecuador
IAS – Invasive Alien Species
IPCC – Intergovernmental Panel on Climate Change
NDC – Nationally Determined Contribution
PCCS – Pyrenean Climate Change Strategy
PIMA – Plan de Impulso al Medio Ambiente
PIRSA – Department of Primary Industries and Region (South Australia)
POLEA – Politics and Environmental Legislation A.C Civil Society organization (Mexico)

RAP Pacifico – Región Administrativa y de Planificación Pacifico
REDD+ – Reducing Emissions from Deforestation and Forest Degradation initiative
SEDUC – State Secretariat of Education (Brazil)
SEMABICC – Ministry of Environment, Biodiversity and Climate Change (Campeche)
SEPA – Scottish Environmental Protection Agency
SMS – Sustainable Management Schemes
UK – United Kingdom
UK PACT – UK Partnering for Accelerated Climate Transitions
UN – United Nations
UNFCCC – United Nations Framework Convention on Climate Change
USA – United States of America
WSUD – Water Sensitive Urban Design

About

Regions4

Regions4 is the global network representing regional governments (states, regions, and provinces) before UN processes, European Union initiatives, and global discussions in the field of sustainable development. Through advocacy, cooperation, capacity-building, and knowledge exchange, we empower regional governments to accelerate climate action, halt biodiversity loss and raise ambition to achieve the global goals towards resilient and sustainable territories and societies. Follow us @Regions4SD or visit www.regions4.org



CDP

CDP is a global non-profit that runs the world's environmental disclosure system for companies, investors, public authorities, cities, states and regions. Over 14,000 organizations around the world disclosed data through CDP in 2021, including more than 13,000 companies worth over 64% of global market capitalization, and over 1,200 cities, states and regions. Fully TCFD aligned, CDP holds the largest environmental database in the world, and CDP scores are widely used to drive investment and procurement decisions towards a zero carbon, sustainable and resilient economy. Follow @CDP to find out more or visit data.cdp.net



Basque Centre for Climate Change

The Basque Centre for Climate Change (BC3) is an international research centre focused on the causes and consequences of climate change. With a multidisciplinary team connected to the main scientific institutions, networks and socio-economic agents, its contribution to the research of climate change and to the science-policy interface over a decade puts BC3 in a unique position to offer knowledge, tools, new methodologies and cross-cutting proposals toward action in a collaborative framework with stakeholders, to design and help implement policies aimed at sustainable development. www.bc3research.org



Race to Resilience

The Race to Resilience is the UN-backed global campaign led by the High-Level Climate Champions for Climate Action that aims by 2030 to catalyse action by non-state actors that builds the resilience of 4 billion people from vulnerable groups and communities to climate risks, through a partnership of initiatives, focus on helping the most vulnerable, frontline communities to build resilience and adapt to the physical impacts of climate change, such as extreme heat, drought, flooding, and sea-level rise. climatechampions.unfccc.int/system/resilience/





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