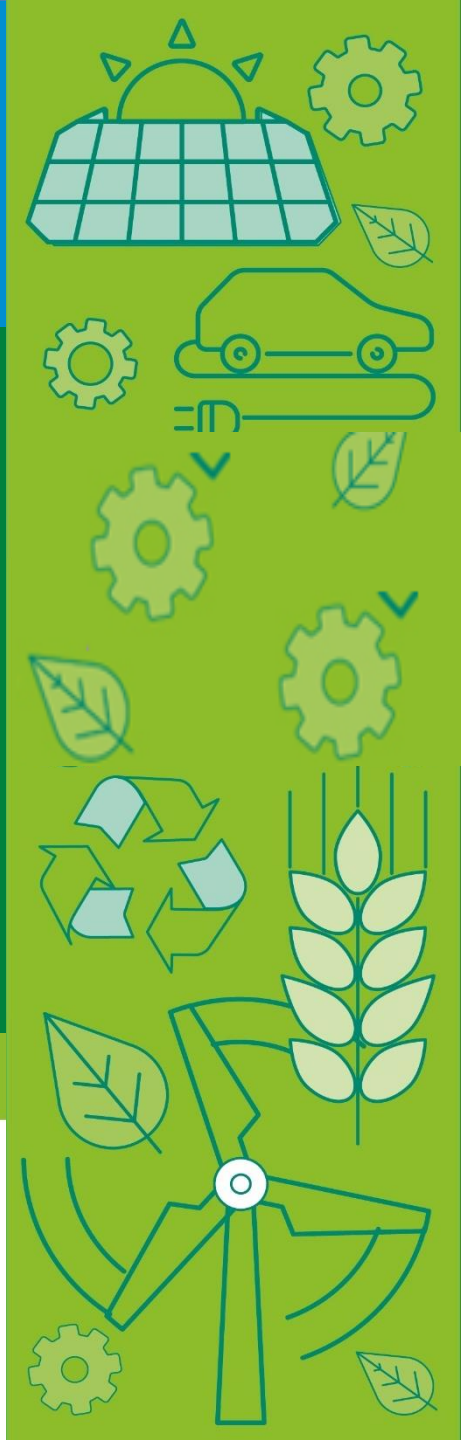
Reducing risks of climate change impacts for Ireland

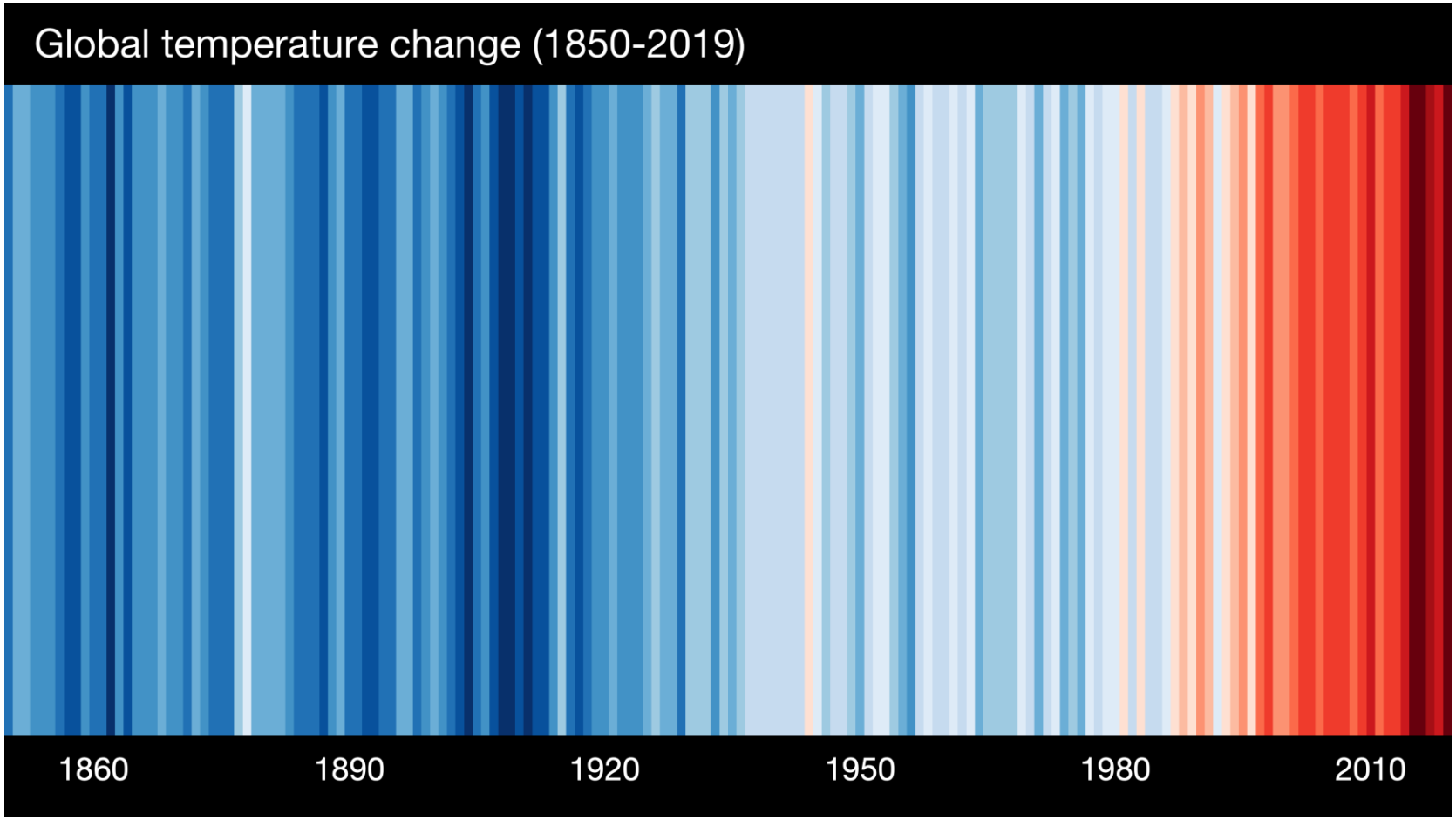
Seán O'Leary, Scientific Officer Impacts and Adaptation



epa
Environmental Protection Agency
An Ghníomhaireacht um Chaomhnú Comhshaoil

Global Warming Stripes from 1850-2019

Environmental Protection Agency



showyourstripes.info

Summary for Ireland

- **Average temperatures have increased** by 0.8°C since 1900
- Projections indicate an increase in average temperatures across all seasons (0.9-1.7°C)
- The number of **warm days** is expected to increase and **heat waves** are expected to occur more frequently

- **Increase in average annual national rainfall** of approximately 60mm or 5% in the period 1981-2010, compared to the 30-year period 1961-1990
- **Significant reductions** are expected in average levels of annual, spring and summer rainfall
- Projections indicate a substantial increase in the frequency of **heavy precipitation events** in Winter and Autumn (approx. 20%)
- **Flood risk** will increase

- Predicted changes in **mean sea level** will be the primary driver in magnifying the impacts of changing storm surge and wave patterns in coastal areas
- Intensity of individual **storms** may increase

NAF, 2018

Outline

- Introduction
  - Climate risk and climate action
- Why adapt to climate change?
  - Current trajectory
  - Observations and projections
- Reducing risks and building resilience to climate change impacts for Ireland
- Conclusion

Future risks and impacts caused by a changing climate

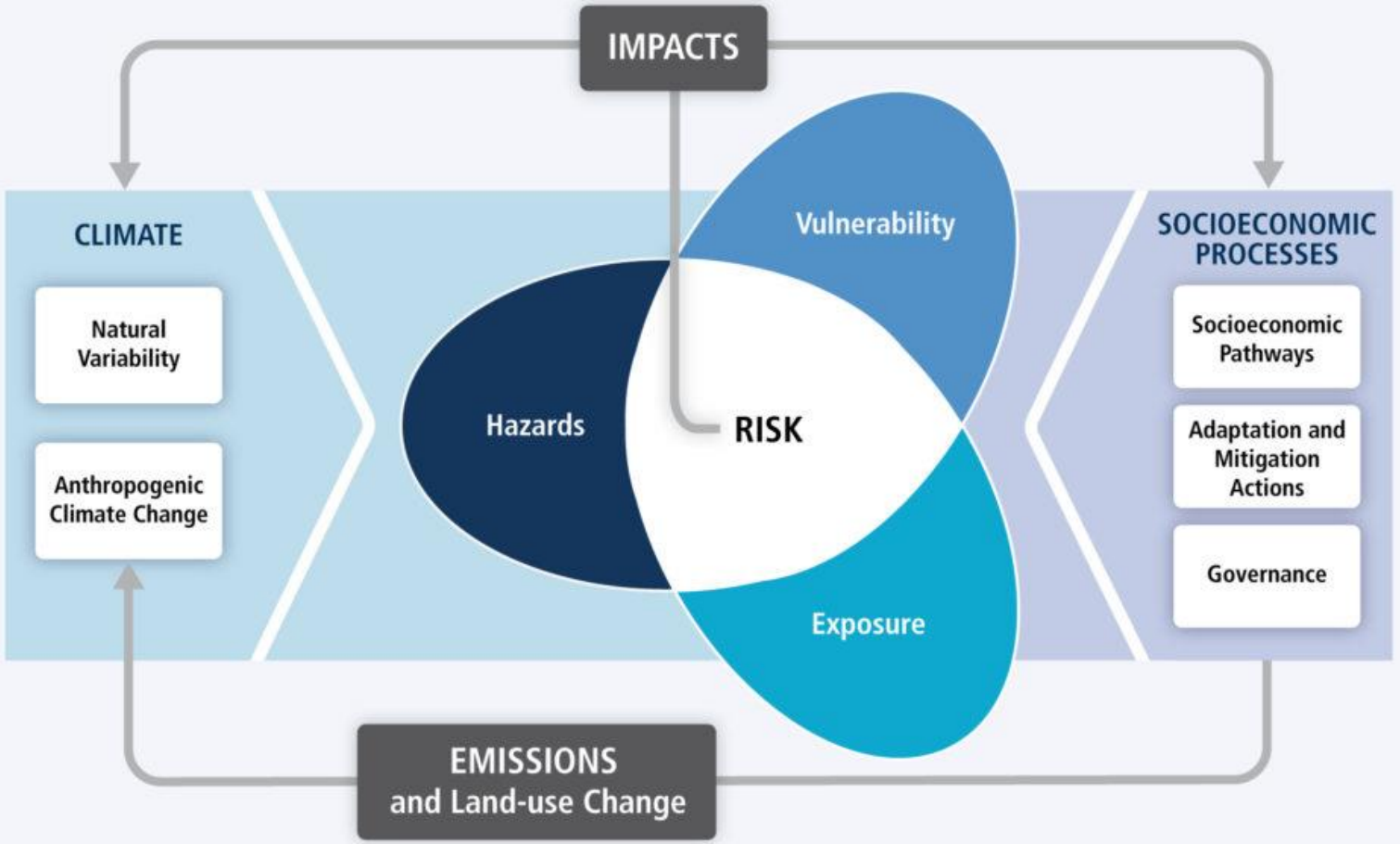
Climate change will **amplify existing risks** and **create new risks** for natural and human systems. **Risks are unevenly distributed** and are generally greater for disadvantaged people and communities in countries at all levels of development.

Continued high GHG emissions would lead to mostly **negative impacts for biodiversity, ecosystem services and economic development** and would amplify risks for **livelihoods, food and human security**.

IPCC, 2014

Climate risk

- Mitigation and adaptation are complementary approaches for reducing risks of climate change impacts.



IPCC, 2014

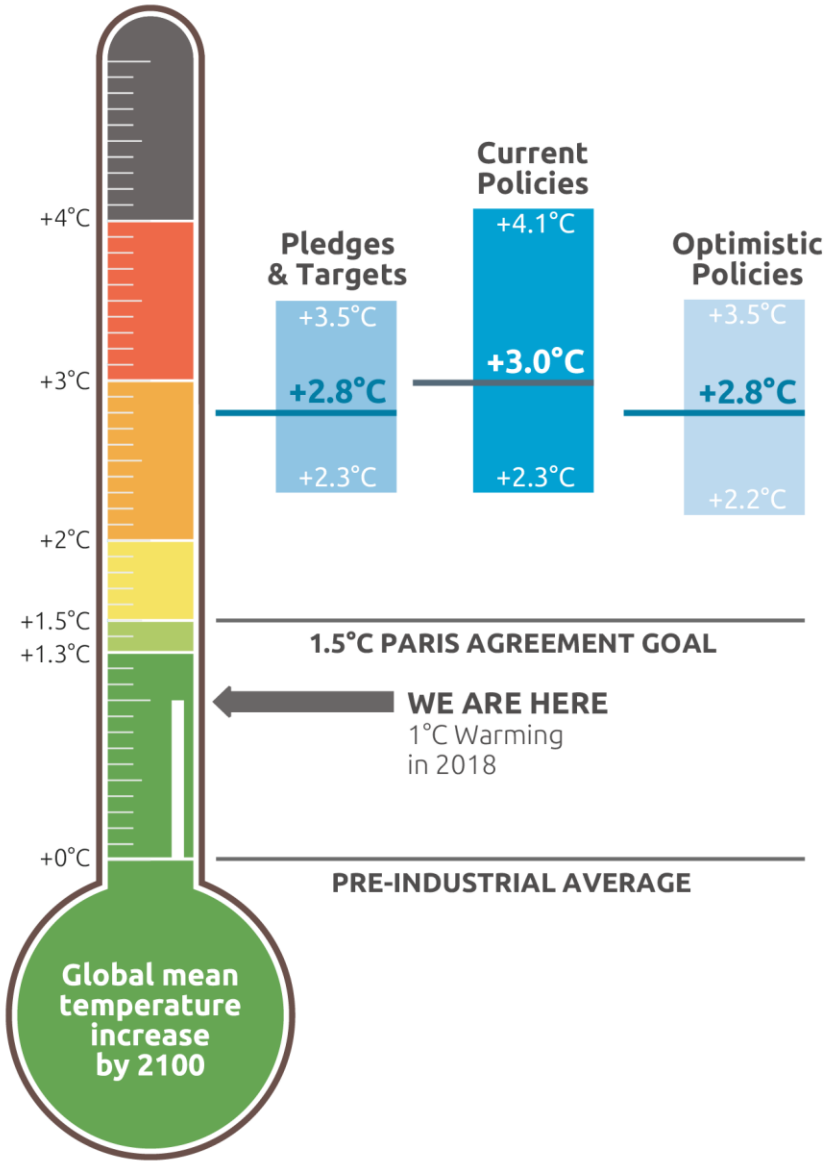
Climate action: adaptation and mitigation

- Adaptation:
  - Addresses the current and future risks posed by a changing climate.
  - Reduces the vulnerability of our environment, society and economy and increase resilience.

- Mitigation:
  - Reduces the rate as well as the magnitude of warming.
  - Increases the time available for adaptation to a particular level of climate change.

- Essential climate policy considers their relationship, co-benefits and trade-offs:
  - Do adaptation actions impact mitigation objectives? Maladaptation?
  - Do mitigation actions impact adaptation objectives?

Paris Agreement and current trajectory



Climate Action Tracker

CAT warming projections

Global temperature increase by 2100

December 2019 Update

IPCC Special Report on Global Warming 1.5°C (2018)

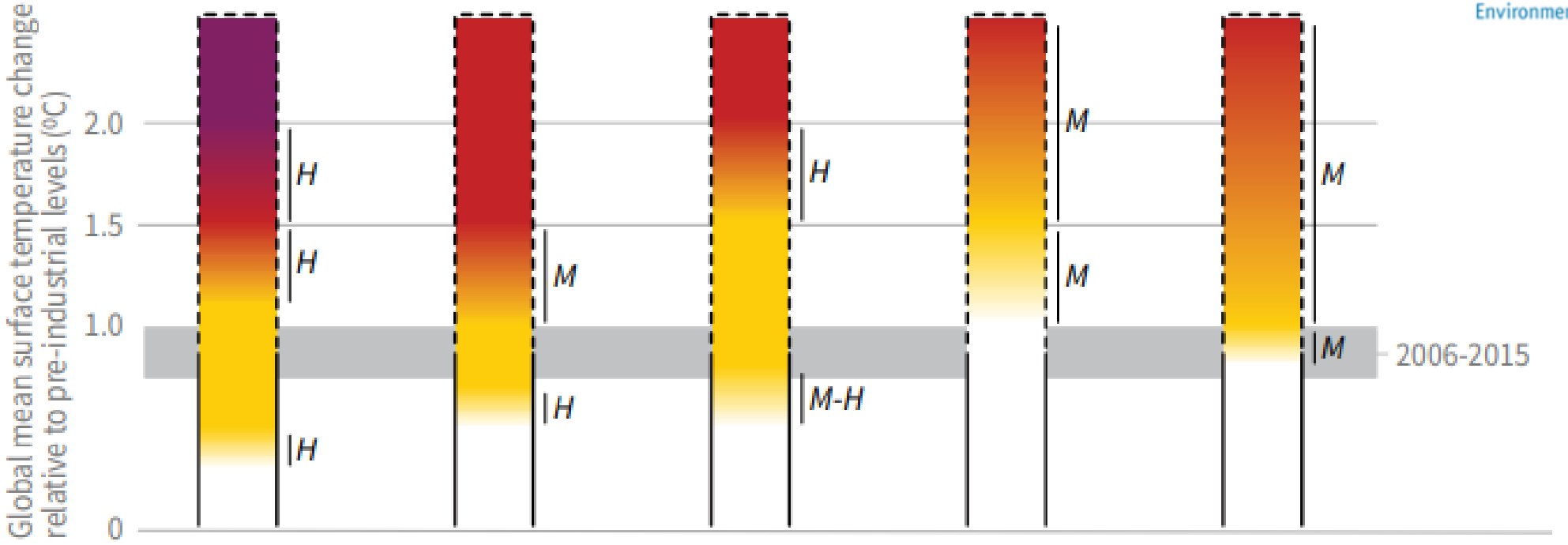
- Limiting global warming to well below 2°C would considerably reduce climate change impacts.

- “Robust difference” between impacts at 1.5°C and 2°C – such as average temperature, frequency of hot extremes, heavy rainfall in some regions and the probability of drought in some areas.

- The risks are also greater if global temperatures overshoot 1.5°C and come back down rather than if warming gradually stabilises at 1.5°C.

- Damages of €63 trillion by 2100 for a 2°C temperature increase scenario, €49 trillion if we keep to 1.5°C of warming.

Reasons For Concern show impacts and risks of different levels of global warming (IPCC SR1.5)



RFC1 Unique and threatened systems

e.g. Coral Reefs, Arctic

RFC2 Extreme weather events

Heatwaves, Flooding

RFC3 Distribution of impacts

Disproportionate impact on groups

RFC4 Global aggregate impacts

Global scale degradation

RFC5 Large scale singular events

Disintegration of ice sheets

Yellow is moderate risks, Red is high risks, Purple is very high risks of severe impacts.

Confidence level: H is high, M is medium, L is low.

For the EU meeting the Paris Agreement means…

- Annual drought losses would be reduced by €20 billion/year.
- Coastal flood losses would be lowered by more than €100 billion/year in 2100.
- 230,000 fewer people exposed to river flooding and river flood damage would be halved to €24 billion/year with 1.5°C in 2100, compared to 3°C.
- Number of people annually exposed to dangerous heatwaves reduced by 200 million with 60,000 fewer deaths per year.

JRC PESETA, 2020

Living in a changing climate

Record Breaking European Summer July 2019

- In 2019, exceptionally hot weather occurred across Europe in June and July, leading to record-breaking high temperatures. A record-breaking warm spell also occurred in February.

- Every heat wave occurring in Europe today is made more likely and more intense by human-induced climate change.

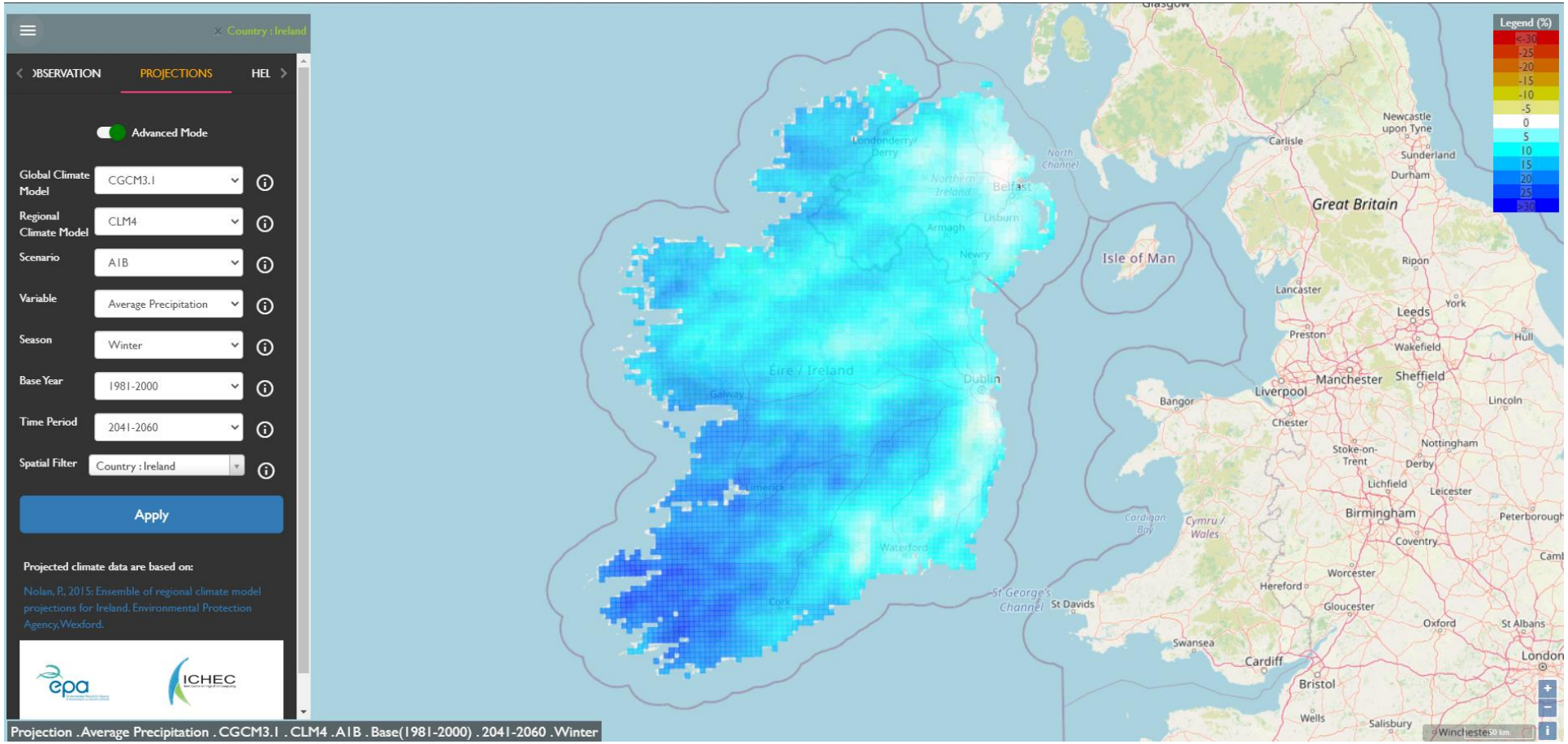
- Heat wave 100 times more likely than without climate change in France and Netherlands (at least 10x).

- Heat wave 10 times more likely than without climate change in UK and Germany (at least 3x).

worldweatherattribution.org

Regional Climate Projections for Ireland

Environmental Protection Agency

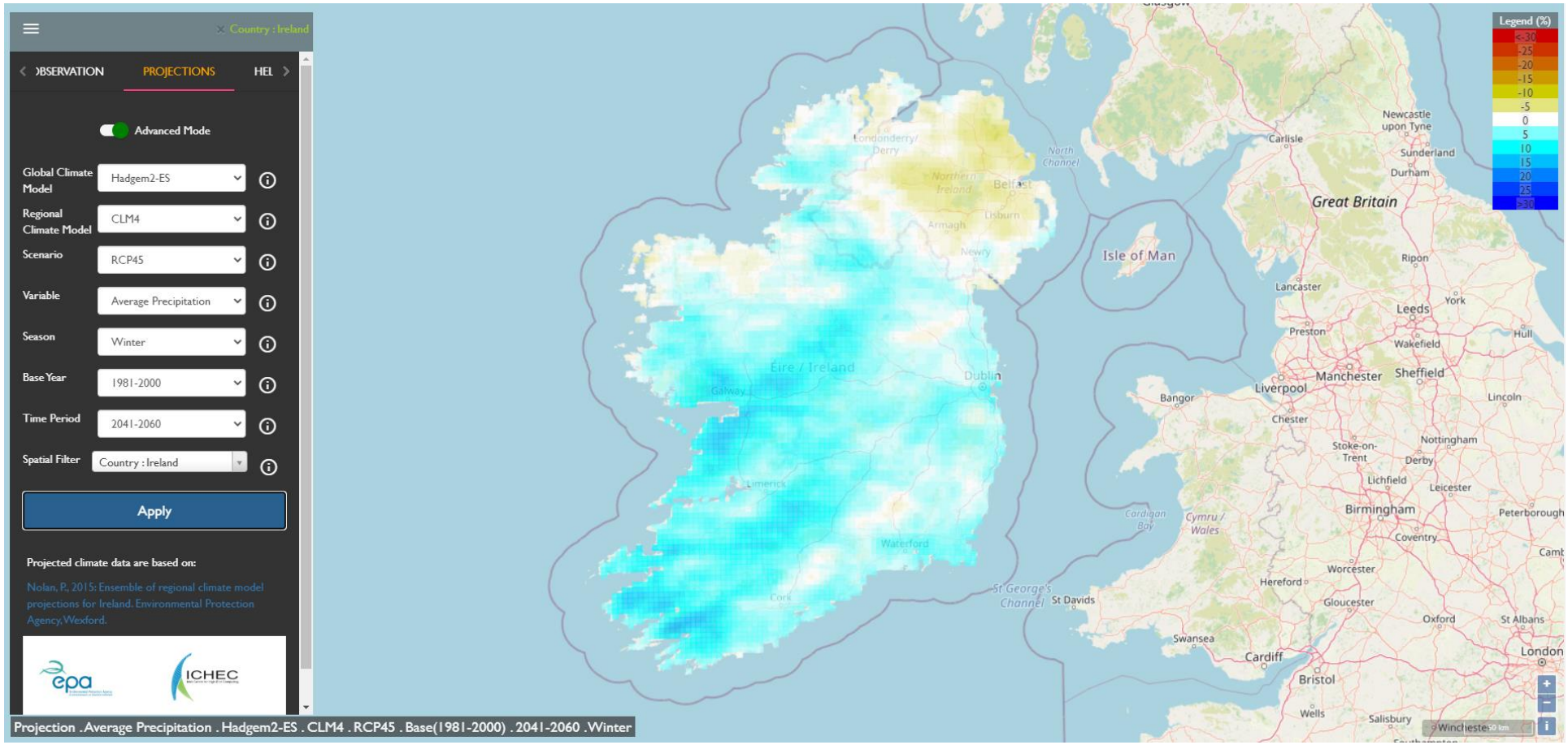


www.climateireland.ie

Projected climate data are based on Nolan, P. 2015. Ensemble of Regional Climate Model Projections for Ireland

Regional Climate Projections for Ireland

Environmental Protection Agency

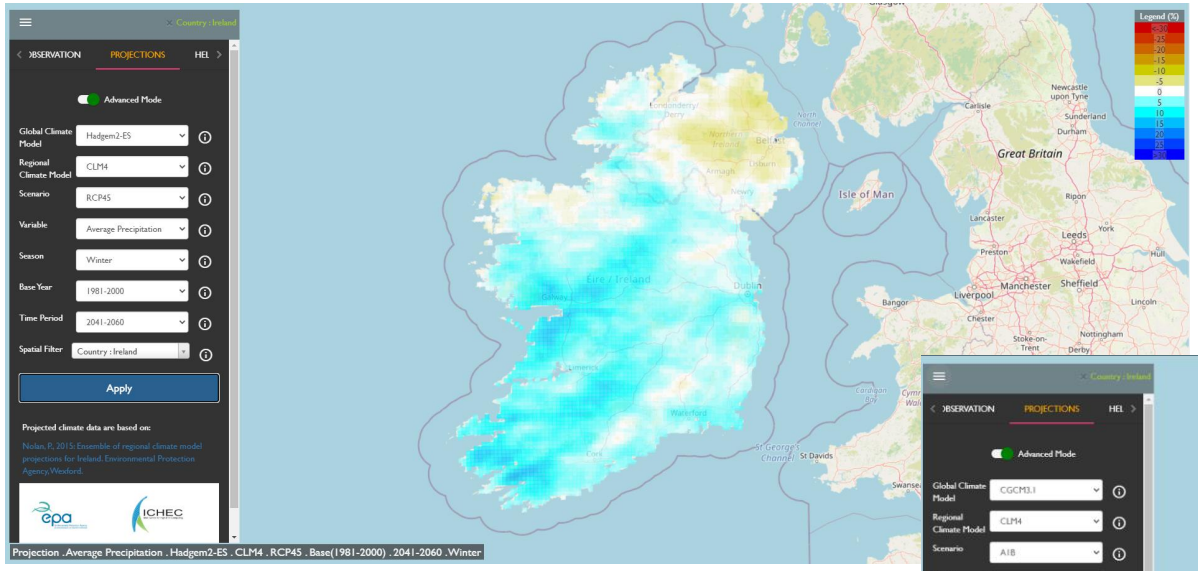


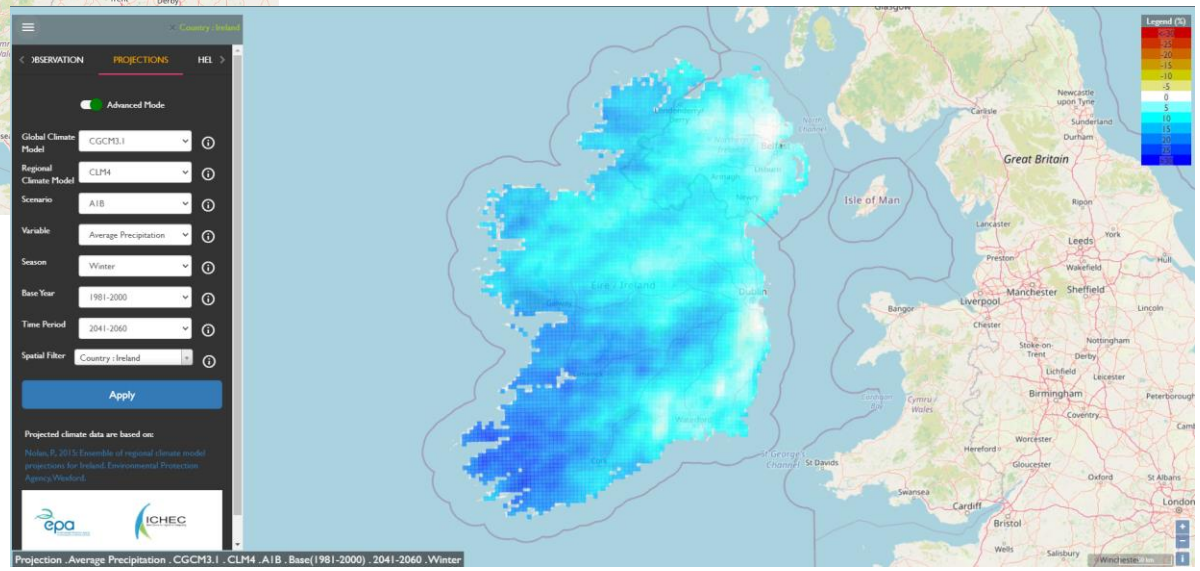
www.climateireland.ie

Projected climate data are based on Nolan, P. 2015. Ensemble of Regional Climate Model Projections for Ireland

Regional Climate Projections for Ireland

Environmental Protection Agency





www.climateireland.ie

Climate resilience in Ireland

- Climate Action and Low Carbon Development Act 2015
- National Adaptation Framework (2018)
- Sectoral Adaptation Plans (2019)
  - 9 plans, 12 priority sectors
  - 180+ actions
- 31 Local Adaptation Strategies (2019)

Adaptation planning to adaptation action: Climate Change Advisory Council (2019)

- Climate adaptation is expensive, but inaction will likely cost more.
- Good progress but gaps remain.
- Need for adaptation remains under-recognised in policy and needs to be fully integrated with appropriate resourcing.
- Private sector and household adaptation decisions will also be very important.
- Need to consider a range of global warming scenarios, including those with higher warming, e.g. UK: plan for a minimum of 2°C, consider 4°C.

Research and resources

- EPA climate change research reports including:
  - Paranunzio, R. et al 2020. Assessing Vulnerability to Climate Change: An Approach Illustrated through Large Urban Scale Adaptation (Urb-ADAPT).
  - Desmond, M. et al 2017. A Summary of the State of Knowledge on Climate Change Impacts for Ireland.
  - Nolan, P. 2015. Ensemble of Regional Climate Model Projections for Ireland. Update available shortly.
  - www.epa.ie/pubs/reports/research/climate/
- Ireland's Climate Information Platform www.climateireland.ie.
- Climate services for decision making - JPI Climate, Copernicus.
- Horizon Europe Mission on adaptation including societal transformation – "accelerating the transition to a climate prepared and resilient Europe".
- Forthcoming "more ambitious" EU Adaptation Strategy to address direct, indirect and spillover impacts.

Global Commission on Adaptation, 2019

We face a crisis. Climate change is upon us, and its impacts are getting more severe with each passing year. Global actions to slow climate change are promising but insufficient... **Adaptation is not an alternative to a redoubled effort to stop climate change, but an essential complement to it**...

The good news is that **adaptation, done right, will lead to better growth and development**. It will also **save lives, protect nature, reduce inequalities, and create opportunities**.

Conclusion

- We are already seeing the negative impacts of climate change and adaptation is required due to the effects of past and ongoing emissions.
- Climate change amplifies existing risks and creates new ones.
- Both adaptation and mitigation are essential to reduce the impacts of climate change, but their relationship must be considered in policy.
- Successful adaptation requires planning for a range of future climate scenarios. Well planned, early, adaptation saves money and disruption later.

Environmental Protection Agency

Thank You