

Climate Change

A perspective from the U.S.

Judith Curry



The apocalyptic climate narrative



- The Earth's climate is **warming**
- A warming climate is **dangerous**
- We're causing the warming by emitting CO₂ from burning **fossil fuels**
- We need to prevent dangerous climate change by **eliminating CO₂ emissions**.

“We are on a **highway to climate hell** with our foot still on the accelerator” – *Antonio Guterres, UN Sec'y General 2023*

“The global fossil fuel crisis must be a game-changer. So let us not take the 'highway to hell' but let's earn the clean ticket to heaven.” - *Ursula von der Leyen 2021*

“So we have to do **everything humanly possible** to overcome this human challenge” – *Angela Merkel 2019*



Climate Policy: Between a Rock and Hard Place

Paris Agreement: keeping warming to within 1.5°C requires **NETZERO** emissions by 2050

Concerns:

- technical, economic & political feasibility
- priority relative to other world/local problems
- unintended consequences



- “Has NetZero Cost Germany Its Top Spot in Manufacturing?”
- “As Europe Deindustrializes, Can Economic Suicide be Avoided?”
- “Farmers Are In Revolt and Europe’s Climate Policies are Crumbling”
- “Fossil Fuels Still Represent 80% of Total Energy Supply in Germany”
- “Germany likely to miss 2030 climate goals”
- “Germany's Energy Transition Hits Reverse So Far in 2025”

US Department of Energy



U.S. DEPARTMENT
of **ENERGY**

A Critical Review of Impacts of Greenhouse
Gas Emissions on the U.S. Climate

July 23 2025

Climate Working Group:

John Christy, Ph.D.

Judith Curry, Ph.D.

Steven Koonin, Ph.D.

Ross McKittrick, Ph.D.

Roy Spencer, Ph.D.

Energy Secretary Chris Wright:

“What I’ve found is that media coverage often distorts the science. Many people—even well-meaning ones—walk away with a view of climate change that is exaggerated or incomplete.

To provide clarity, I asked a diverse team of independent experts to summarize the current state of climate science, with a focus on how it relates to the United States.”

"97% of climate scientists agree"

- Surface **temperatures** have **increased** since 1880
- Humans are **adding carbon dioxide** to the atmosphere
- Carbon dioxide and other greenhouse gases have a **warming effect** on the planet

Disagreement among scientists:

- How much of the warming has been **caused by humans**, versus **natural climate variability** (sun, volcanoes, ocean circulations)
- How much the planet will warm in the **21st century**
- Whether warming is '**dangerous**'
- How we should **respond** to the warming, to improve human well being



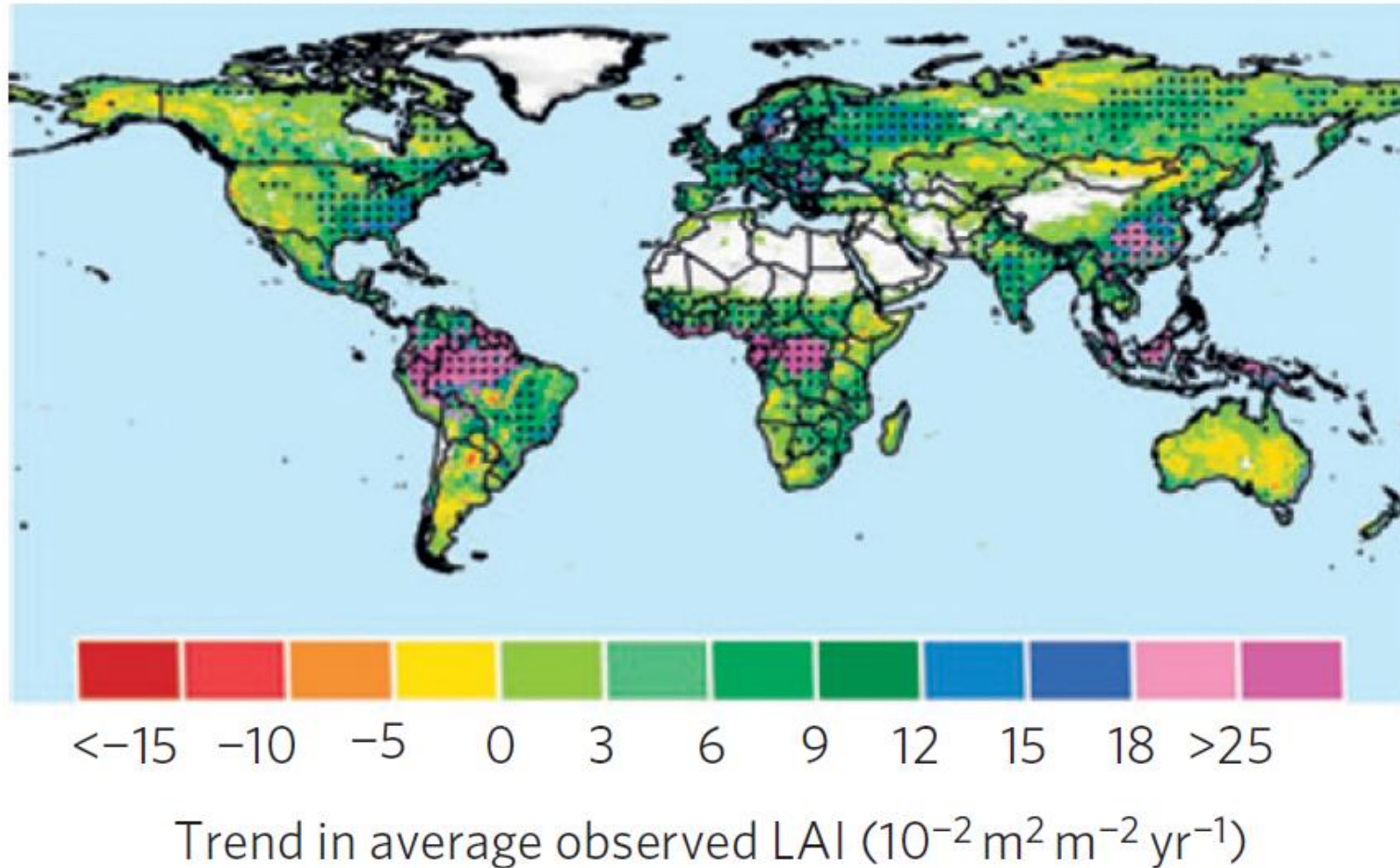
Distinguishing Features of the DOE Report

- Critically evaluates key topics in IPCC Reports. Considers policy-relevant climate science topics that received **inadequate attention** in by IPCC assessment reports.
- Our assessment is **data driven** and considers **natural climate variability** as well as human causes.
- **Uncertainties** and areas of **disagreement** are clearly described. This is *not* a “consensus seeking” document.
- Seeks some **sane middle ground** that realistically (and apolitically) assesses climate risk.



I. Direct Human Influences on Ecosystems & the Climate

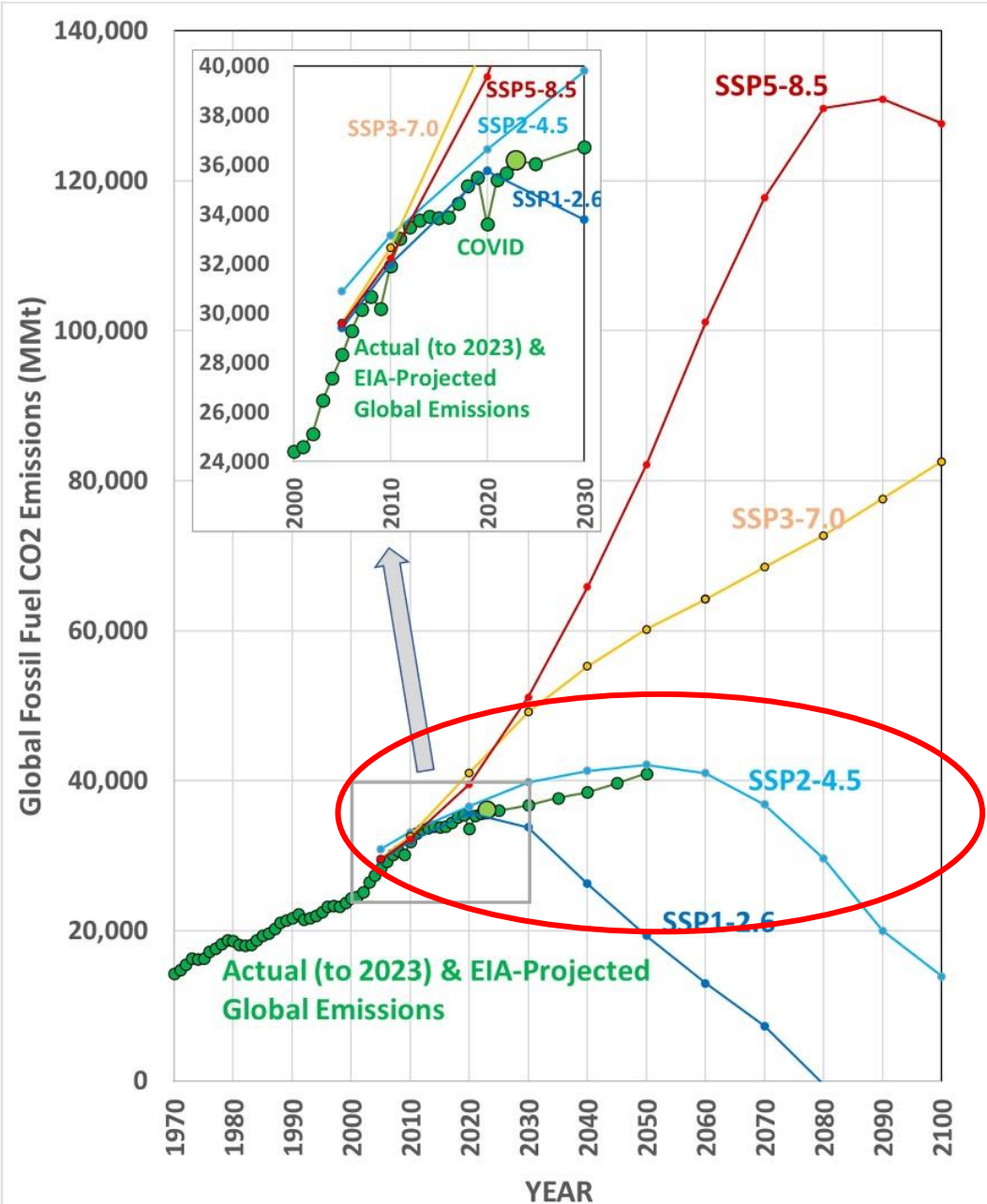
- Documents “global greening” including the benefits to agriculture



- Global increase in leaf area detected by satellite; CO_2 increase is primary cause
- CO_2 enhances photosynthesis and crop water uptake
- IPCC: superficial discussion and leaves it out of Summaries



I. Direct Human Influences on Ecosystems & the Climate



- Clear justification against using extreme emissions scenarios in policy making

- Most academic climate impact studies are based upon the extreme 8.5 scenario that is now considered implausible
- The IPCC AR6 relied heavily on the extreme emission scenario
- EIA projections of global emissions to 2050 are below the medium (4.5) emission scenario
- Widespread use of 8.5 as a no-policy baseline has created a bias towards alarm in the climate impacts literature.

II. Climate Response to CO₂ Emissions

- Strong recent evidence indicates **lower values** of climate sensitivity to increasing CO₂
- Challenges climate models with observations; finds that global climate model simulations are **not fit** for policy-relevant purposes
- Challenges methods of **attribution** of global warming and extreme weather events: problems with the statistical analysis methods and inadequate assessment of natural climate variability
- Challenges projections of large, accelerating rates of **sea level rise**

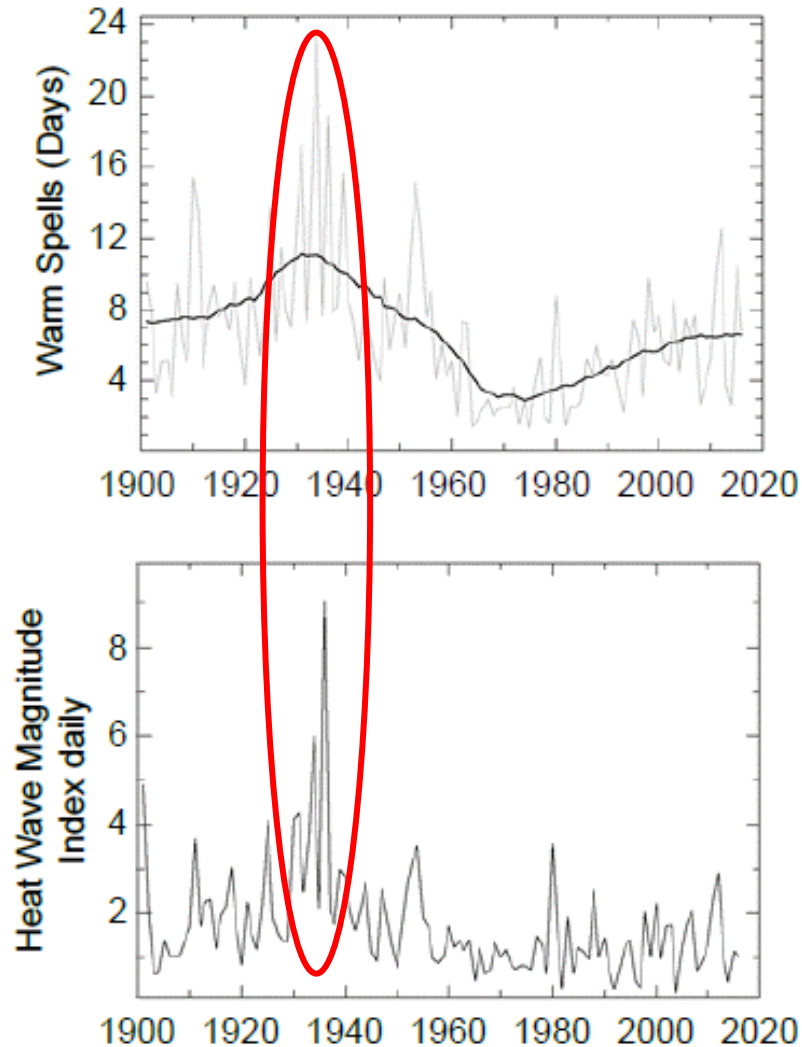


U.S. DEPARTMENT
of **ENERGY**

A Critical Review of Impacts of Greenhouse
Gas Emissions on the U.S. Climate

II. Climate Response to CO₂ Emissions

- Comprehensive analysis of U.S. extreme weather in back to 1900: most types of extreme weather exhibit no statistically significant long-term trends

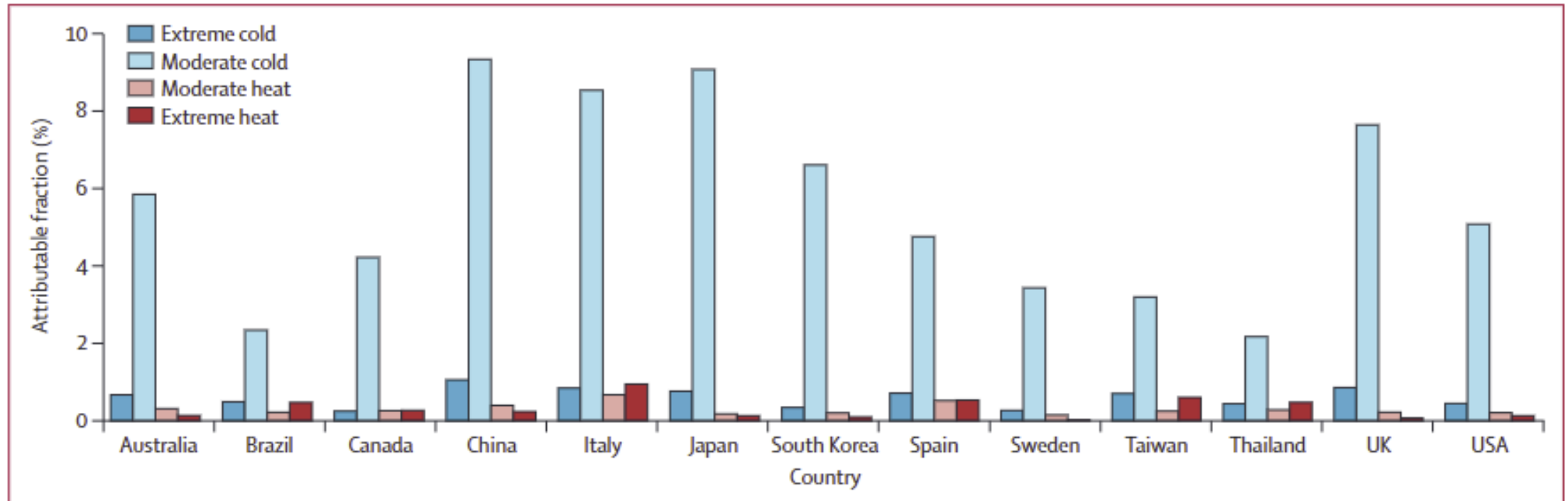


- During the 1930's, the U.S. saw the
- Worst heat waves
 - Worst droughts
 - Extensive wild fires
 - Most intense landfalling hurricanes



III. Impacts on Ecosystems and Society

- Mortality from extreme cold is much higher than that for extreme heat; warming overall reduces mortality from temperature extremes

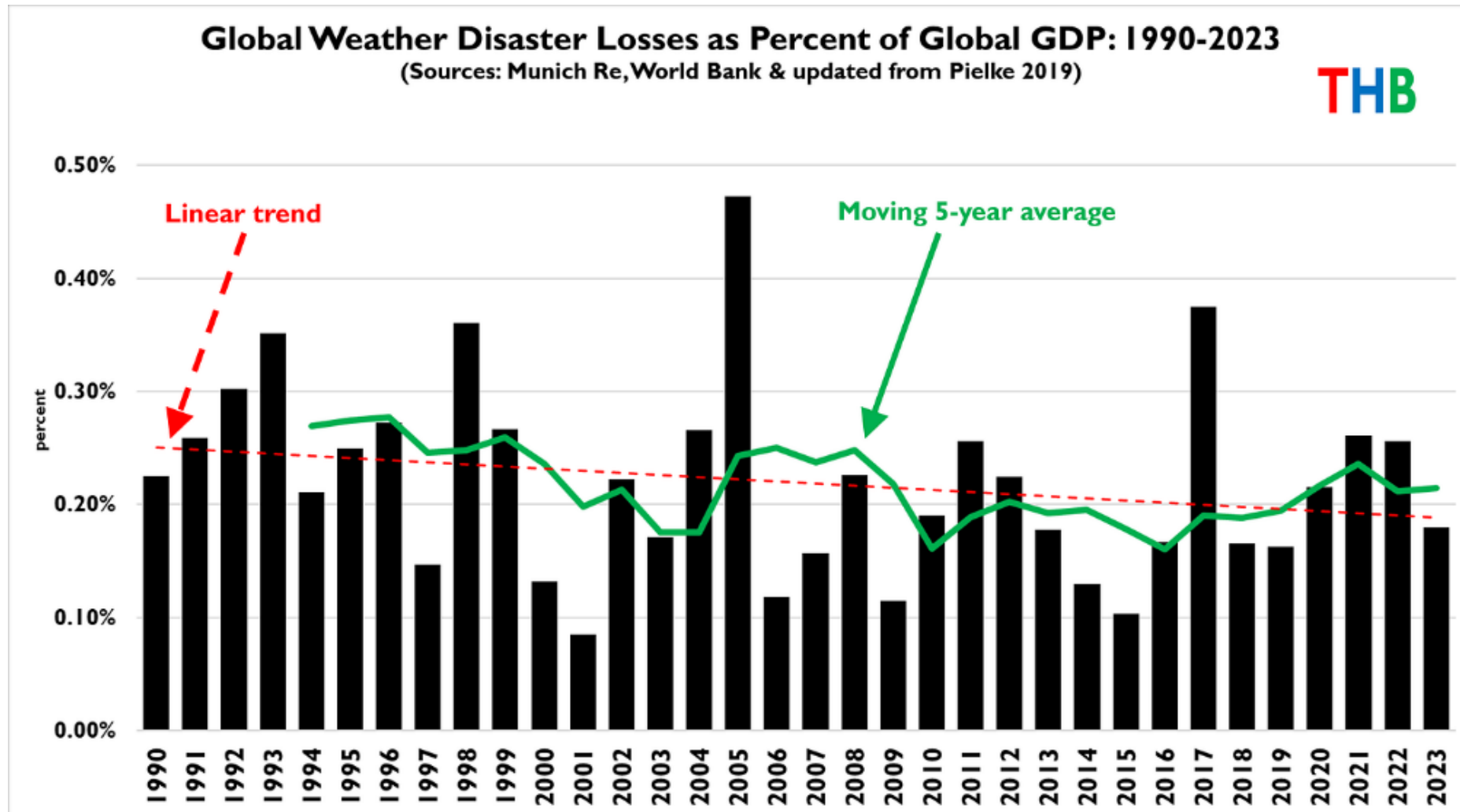


- Key to adaptation is keeping energy costs down



III. Impacts on Ecosystems and Society

- While extreme weather events are costly, in all modern economies they are becoming less and less important as a proportion of global GDP



III. Impacts on Ecosystems and Society

- Economists emphasize the **unimportance** of global warming in economic growth
- Warming overall **reduces mortality** from temperature extremes
- Increasing CO₂ and warming is expected to be a net **zero impact** on US agriculture
- There are **deep uncertainties** associated with estimates of the Social Cost of Carbon
- U.S. policy actions are expected to have **undetectably small** direct impacts on the global climate and any effects will emerge only with long delays.



U.S. DEPARTMENT
of **ENERGY**

A Critical Review of Impacts of Greenhouse
Gas Emissions on the U.S. Climate

12.3 Concluding thoughts

This report supports a more nuanced and evidence-based approach for informing climate policy that explicitly acknowledges **uncertainties**.

The **risks and benefits** of a climate changing under both natural and human influences must be weighed against the costs, efficacy, and collateral impacts of any “climate action”, considering the nation’s need for reliable and affordable energy.

An approach that acknowledges both the potential risks and benefits of CO₂, rather than relying on flawed models and extreme scenarios, is essential for **informed and effective decision-making**.



U.S. DEPARTMENT
of **ENERGY**

A Critical Review of Impacts of Greenhouse
Gas Emissions on the U.S. Climate

Hoped for Outcomes of the DOE Report

- Promote open, respectful **and informed debate** on climate science and its uncertainties
- Redirection of climate science (at least in the U.S.) away from alarmism and advocacy and towards **better understanding** of the fundamentals of climate dynamics.
- Motivation of future climate assessment reports to address **important issues** raised by the DOE report that have previously been ignored or inadequately assessed
- Provide a better basis for assessing risk from climate change and supporting improved decision making



U.S. DEPARTMENT
of **ENERGY**

A Critical Review of Impacts of Greenhouse
Gas Emissions on the U.S. Climate

The fallout: media meltdown, lawsuit

- Predictable outrage: *ad hominem* attacks on the authors and criticism of the process (small group, short time period)
- Some astute observers noted that our report overlapped with the IPCC and endorsed a lot of its basic views

Lawsuit:

- Plaintiffs (Environmental Defence Fund, Union of Concerned Scientists) sued DoE alleging our group was assembled in violation of Federal Advisory Committee Act (FACA)
- Court agreed, although did not grant injunction against use of report
- DoE dissolved Climate Working Group (CWG) on September 3
- CWG authors are working independently on revisions



Technical responses

- >1M comments submitted to the DOE portal; we haven't seen most of these
- Some authors emailed us directly
- Main response documents
 - Dessler, Kopp *et al.*: comments from 86 scientists
 - Carbon Brief: comments from 56 scientists
 - Competitive Enterprise Institute

Our reading of the critiques:

- Identification of a few genuine flaws & errors
- Some useful suggestions that strengthen our report
- Doubling down on “consensus enforcement” without addressing our critiques
- Nothing that would support changing our major conclusions

Inconvenient Truths

Climate risks

Risks from extreme weather and climate change are fundamentally **local**.

The risks are entwined with natural climate variability, land use, & **societal vulnerabilities**.

Blaming weather catastrophes on fossil fuel emissions deflects from the real **causes of our vulnerabilities**.

Many people fear a future **without** cheap, abundant fuel and continued economic expansion far more than they fear climate change.

Climate & energy policies

The **urgency** of meeting NETZERO targets is causing us to make **bad choices** about future energy systems.

If we reach net zero by 2050, we **won't notice any change** in the climate or extreme weather before 2100, relative to natural variability.

Climate Pragmatism

- Accelerate energy **innovation**
- Build **resilience** to extreme weather
- **No regrets** pollution reduction

Strategies:

- Agree on **solutions**, not assumptions
- Feasible, politically viable, affordable, **no-regrets** solutions
- **Local** solutions – secure the common interest

Benefits:

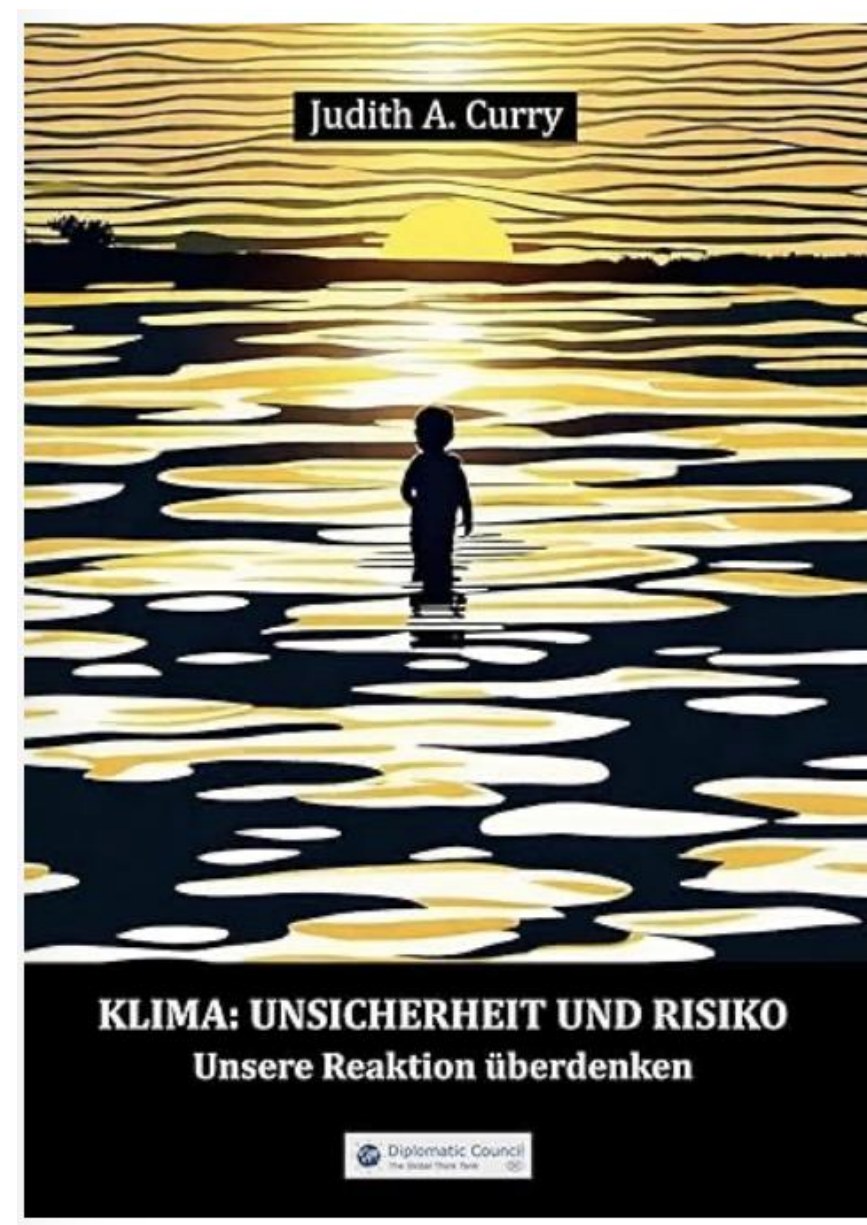
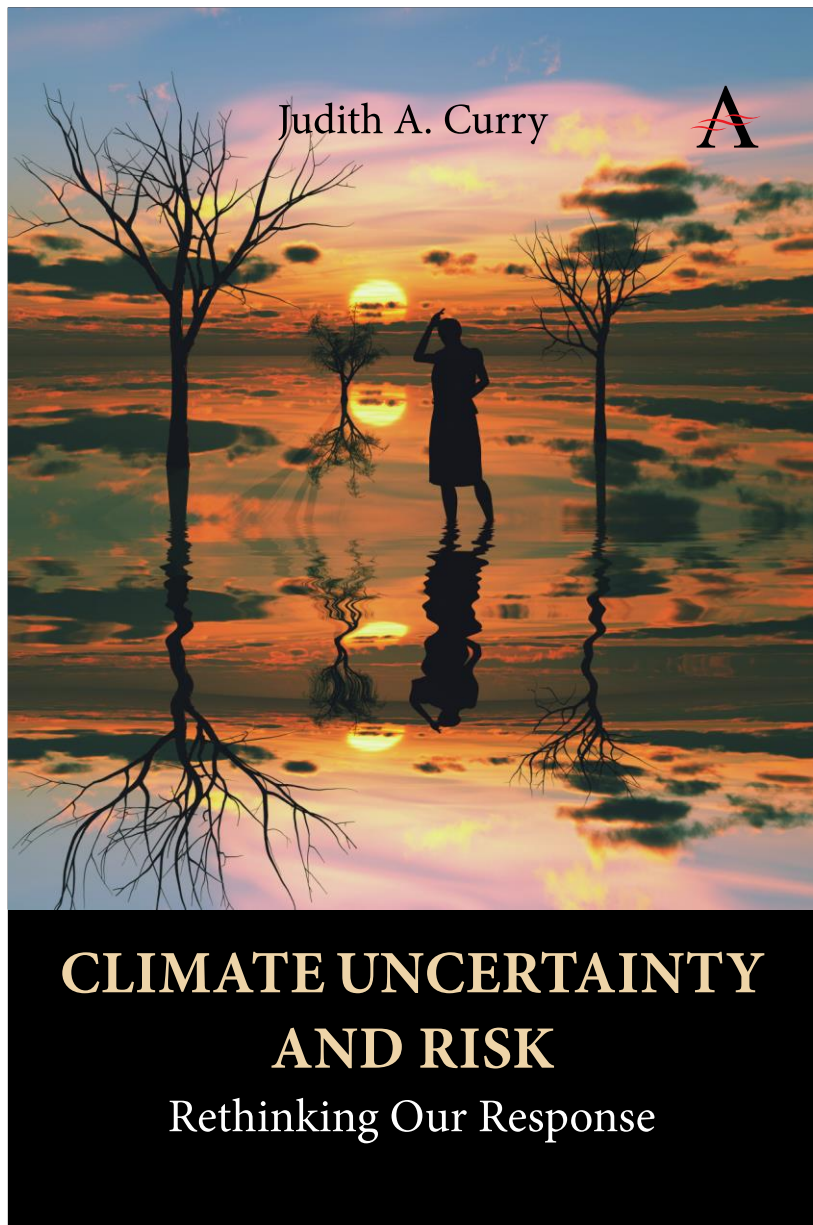
- near-term socioeconomic & environmental **benefits**
- supports both mitigation & adaptation
- justifications **independent** of climate mitigation & adaptation

Avoids:

- political gridlock
- costly policies with minimal impacts on climate
- policies with adverse, unintended consequences

Does **not** require:

- agreement/consensus about climate science
- agreement about risks of emissions, danger



Rethinking the climate change problem, the risks we are facing, and how we can respond.