

Climate Change, Risk, and Economics

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The views herein are those of the presenter and do not necessarily reflect those of the Federal Reserve Bank of Kansas City or the Federal Reserve System

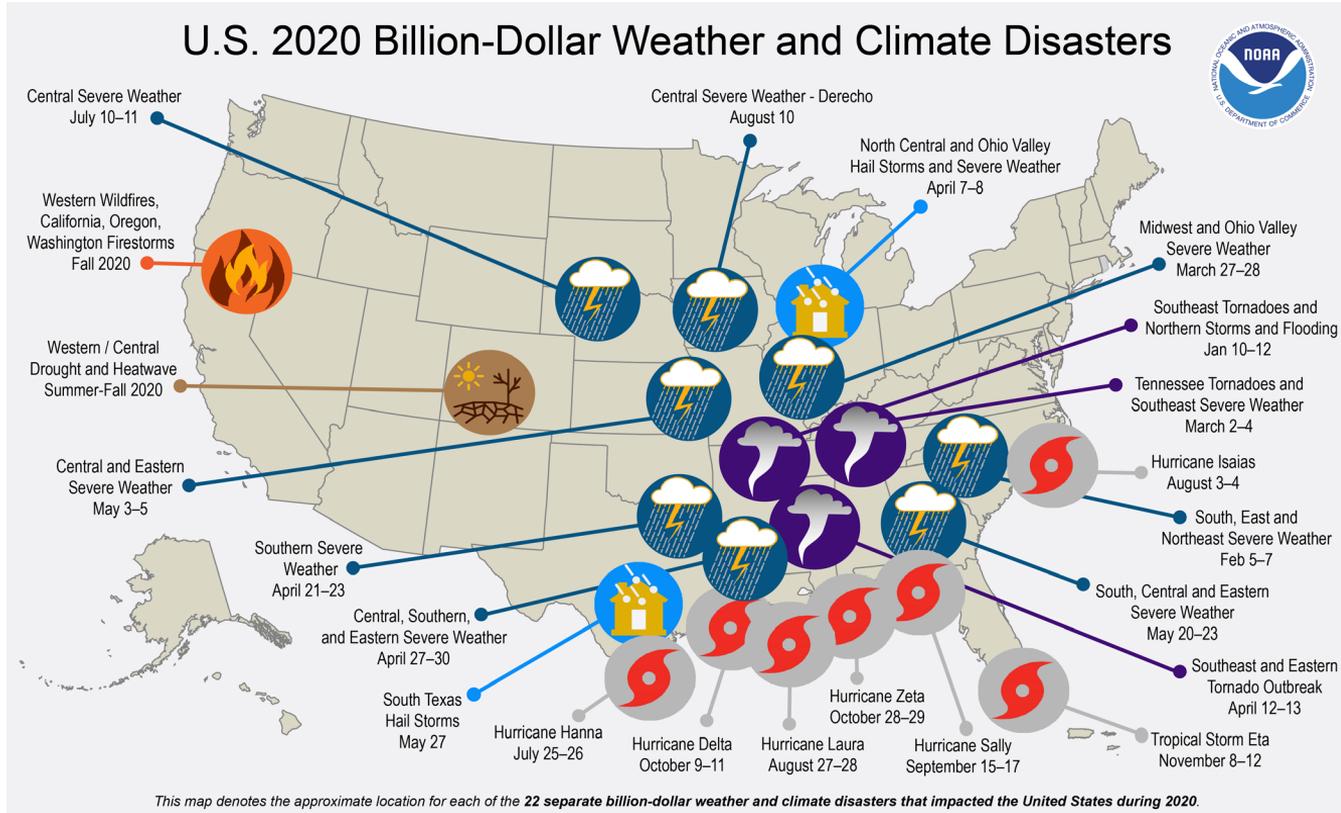


Climate Change, Risk, and Economics Overview

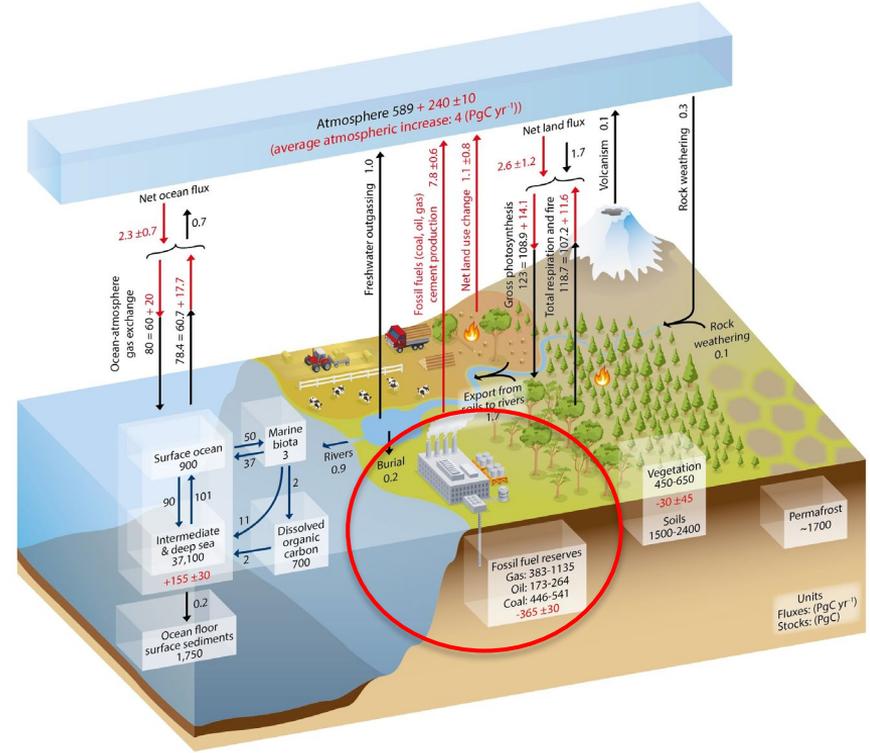
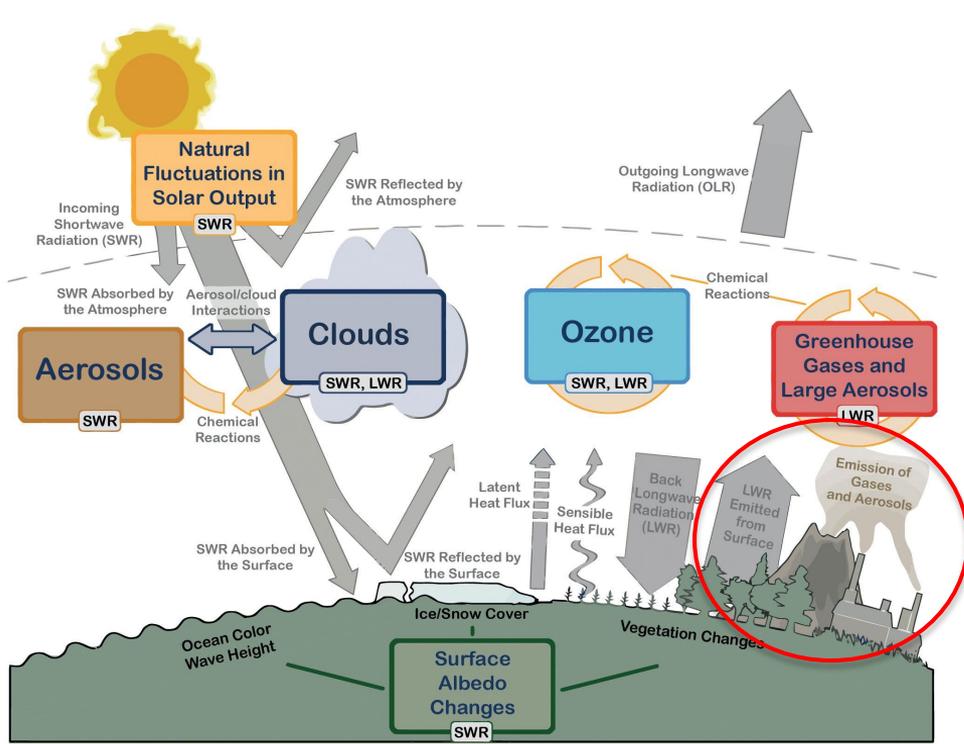
- Rising green house gas (GHG) concentrations from carbon emissions imply elevated global temperatures and a changing climate in the coming decades.
- Natural disaster risk has been on the rise and a changing climate means we are likely to see more climate induced natural disasters (e.g. fires, flood, drought, and hurricanes).
- Climate change and climate risk can affect the economy through physical and transitional risks.
- The financial sector is becoming more climate aware and is beginning to include climate risks in their work.



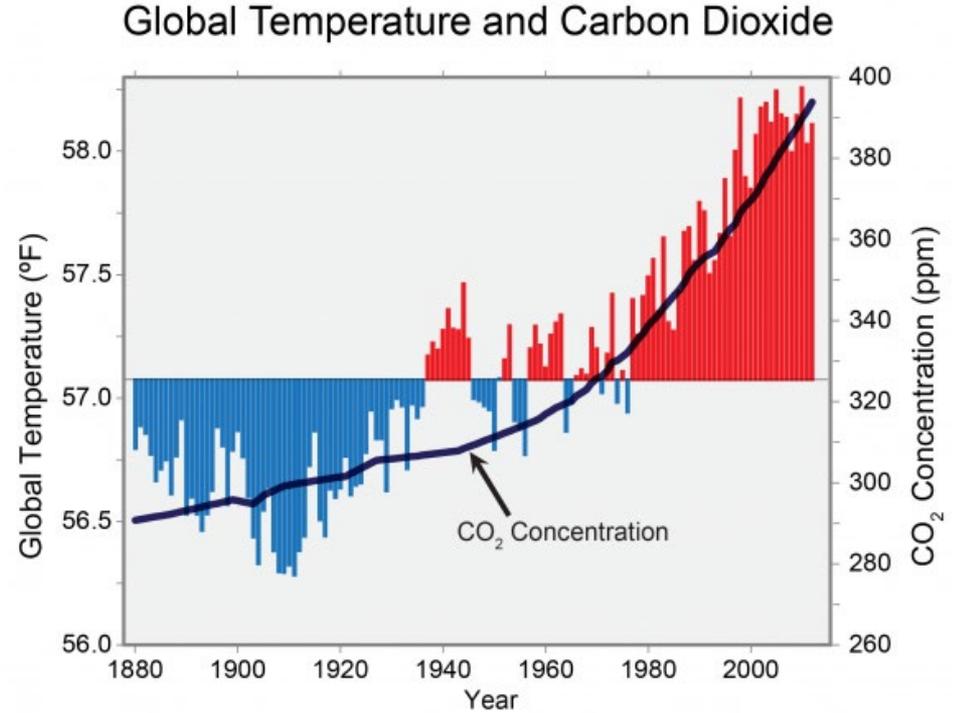
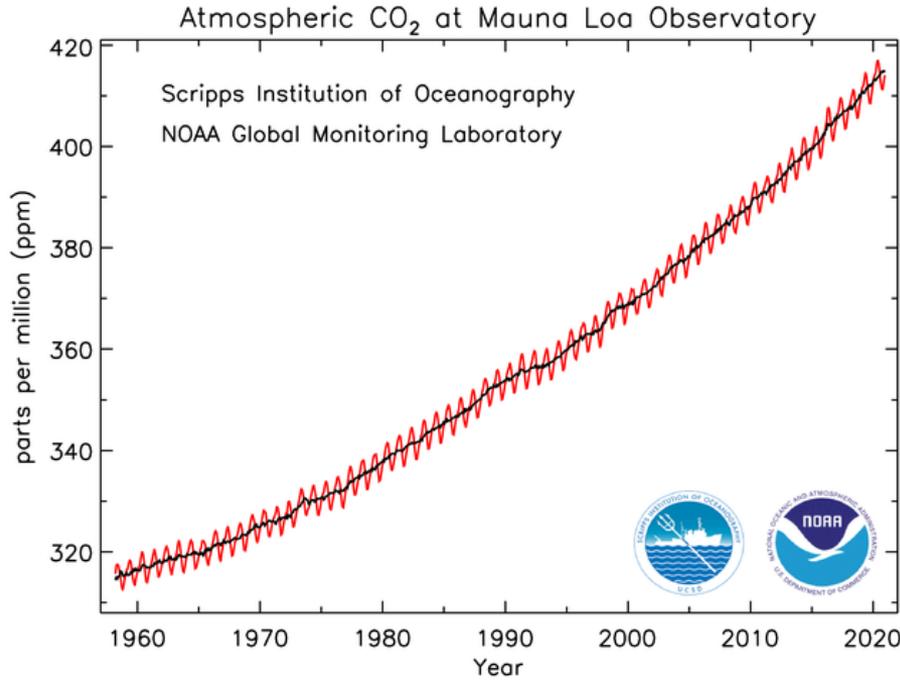
Climate related natural hazards pose regional economic risks.



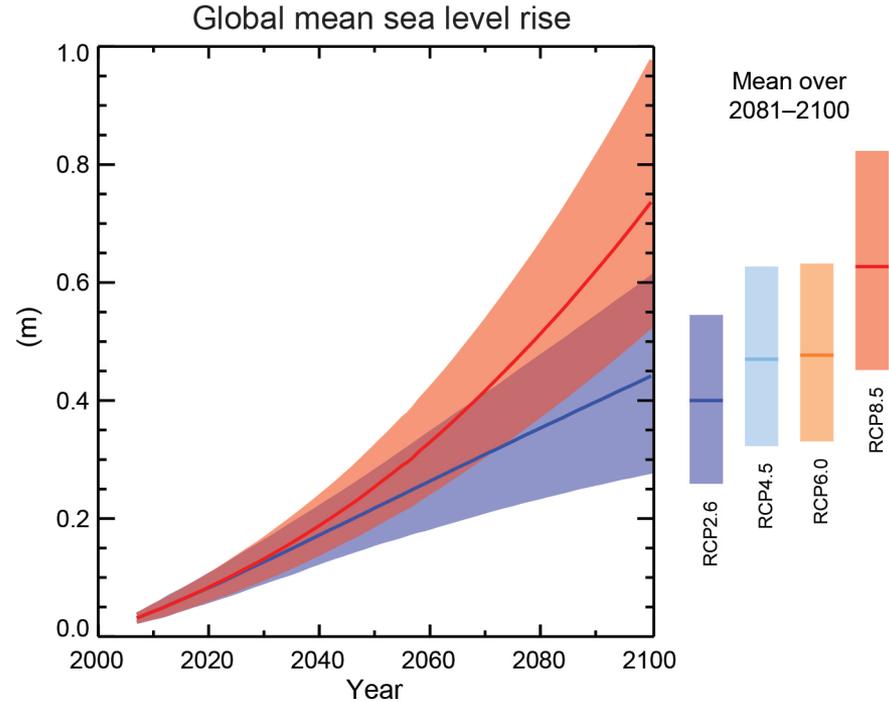
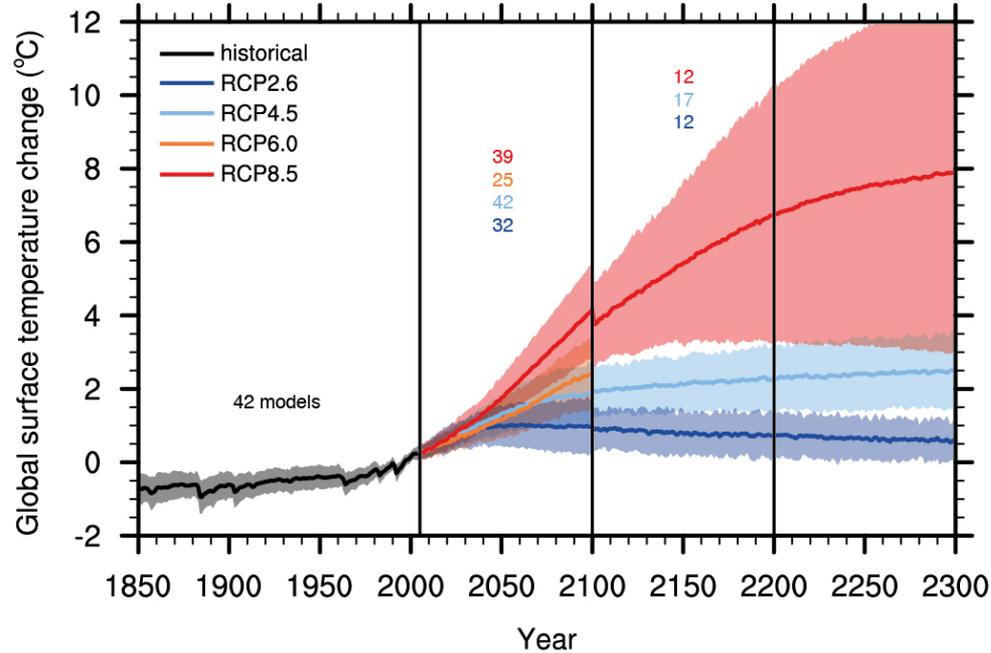
The Greenhouse Gas Effect, Carbon Cycle, and Climate Change.



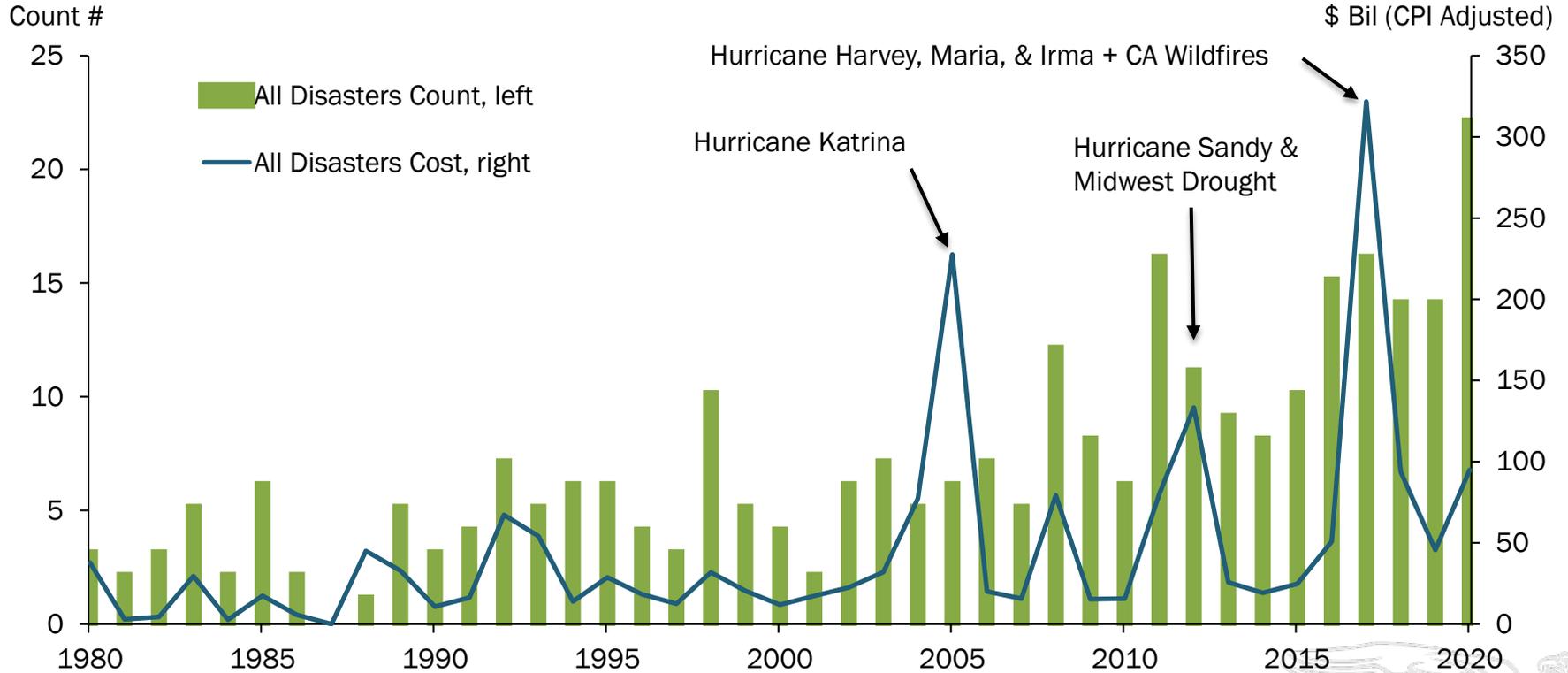
Greenhouse gas (GHG) concentrations and temperatures are on the rise.



Projections are for higher temperatures, but with great uncertainty.



Climate related natural disasters are on the rise.



Climate change has a variety of the risks and opportunities. Climate change may also pose risk to the financial system.

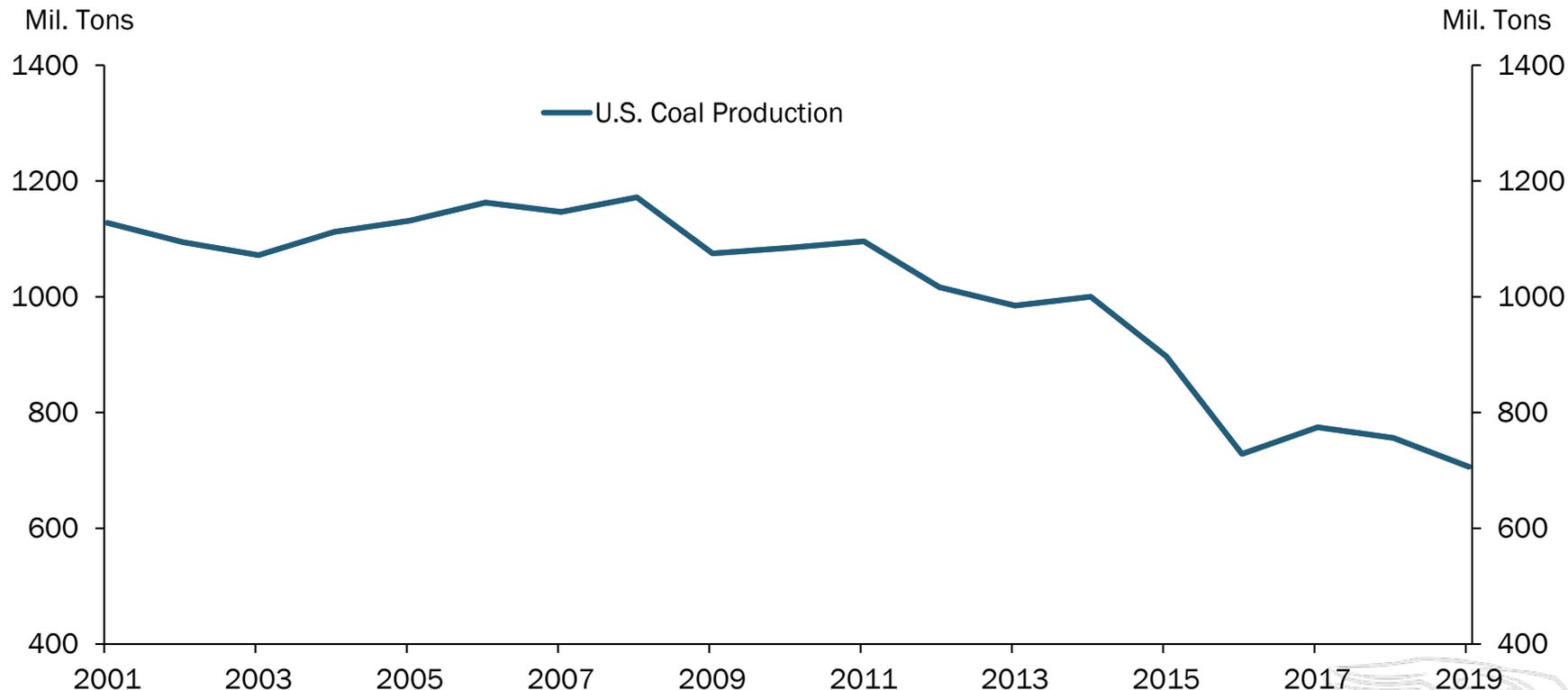


A few words on climate risk and economics.

- Climate change has significant consequences for the U.S. economy and financial sector through slowing productivity growth, asset revaluations and sectoral reallocations of business activity.
- Kevin Stiroh, New York Fed, 11/7/2019
- The Federal Reserve's job is to promote a healthy, stable economy. This requires us to consider current and future risks – whether we have a direct influence on them or not. Climate change is one of those risks.
-Mary C. Daly, San Francisco Fed, 11/8/2019
- It is vitally important to move from the recognition that climate change poses significant financial stability risks to the stage where the quantitative implications of those risks are appropriately assessed and addressed.
-Gov. Lael Brainard, Federal Reserve Board, 11/9/2020



The decline in coal production is one example of a transitional risk.

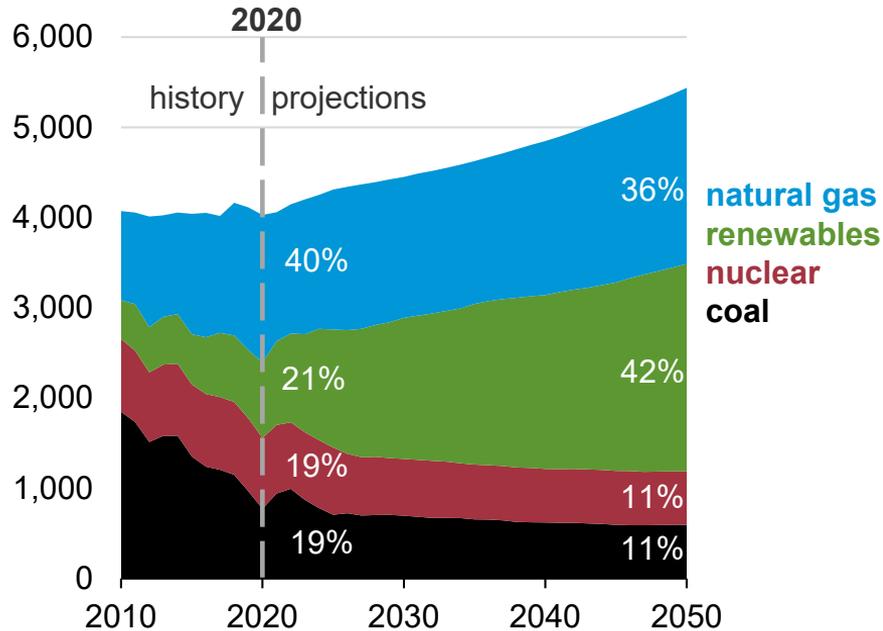


Source: DOE, EIA

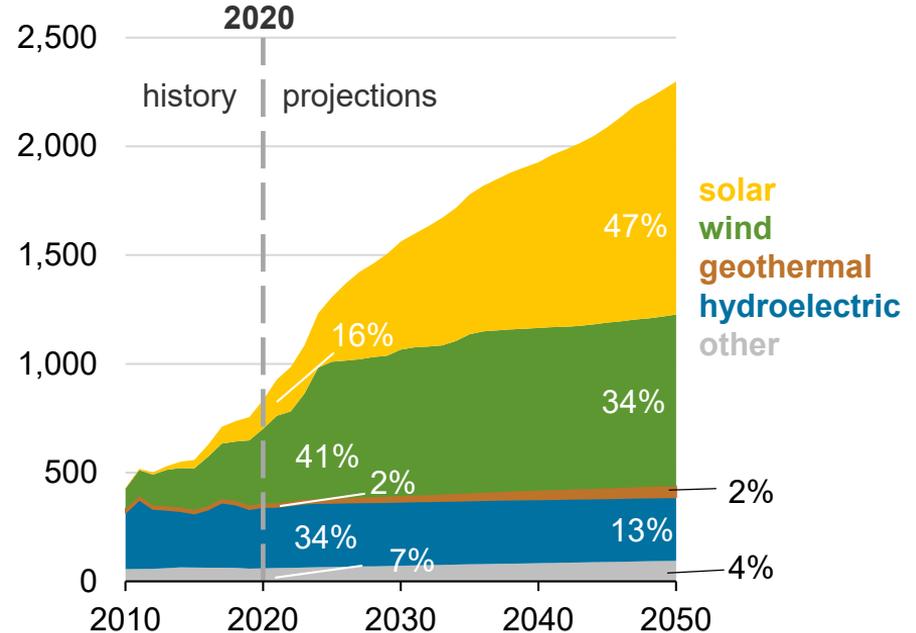


The rise in renewables is an example of a transitional opportunity.

U.S. electricity generation from selected fuels
AEO2021 Reference case
 billion kilowatthours

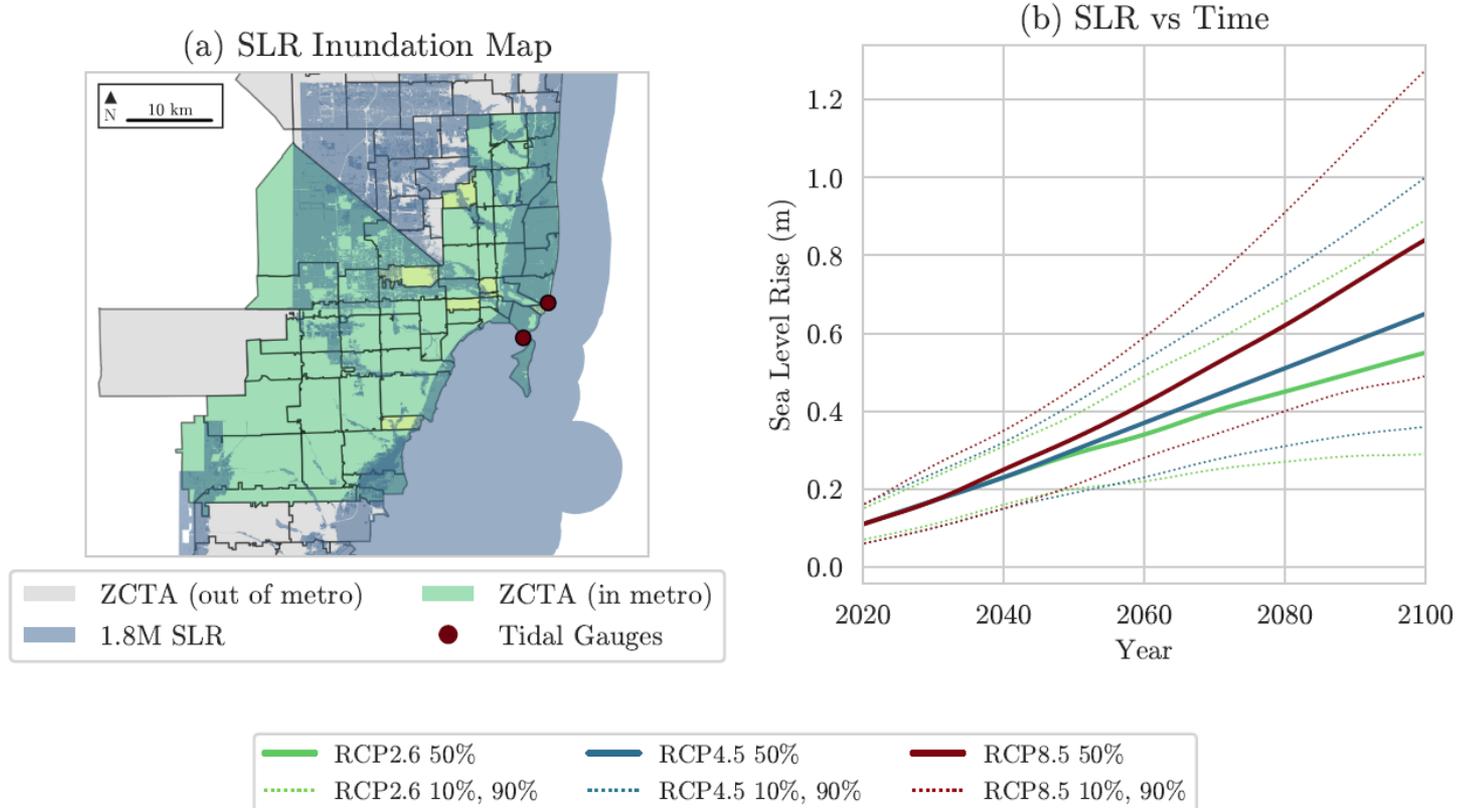


U.S. renewable electricity generation, including end use
AEO2021 Reference case
 billion kilowatthours



Conducting climate economics research is complex.

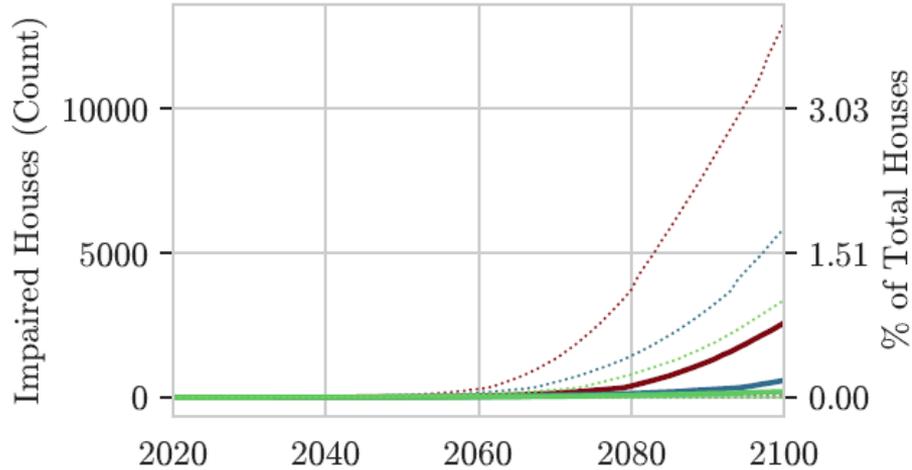
Miami: Sea-Level Rise vs Time



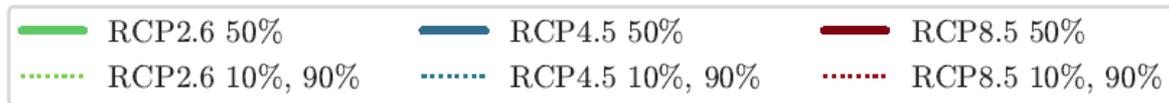
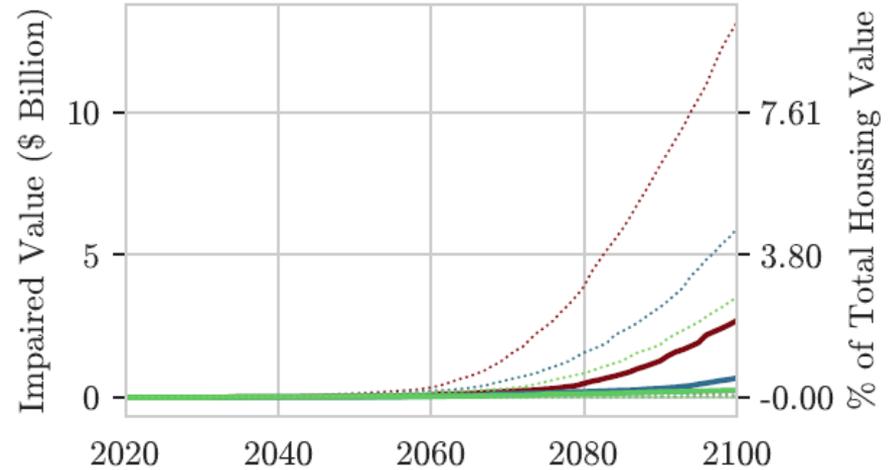
However, the economic insights can be useful.

Miami Housing Impairment Over Time

a) Count



b) Value



Quality data and a cross disciplinary approach is important.

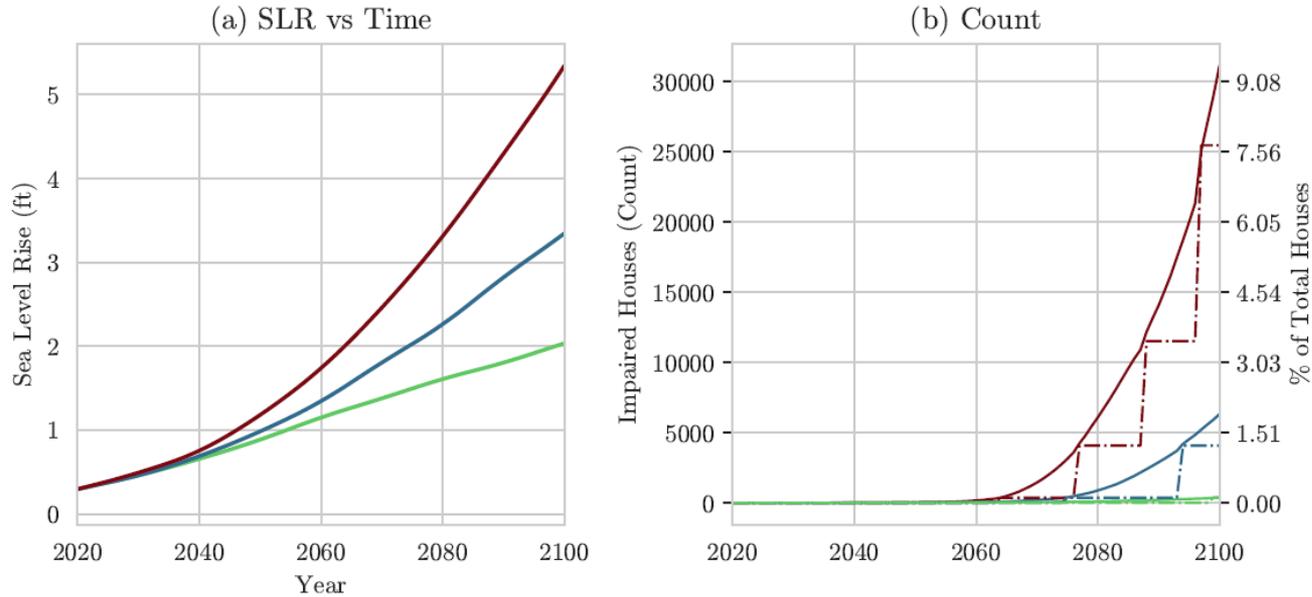
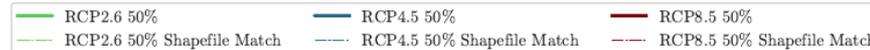
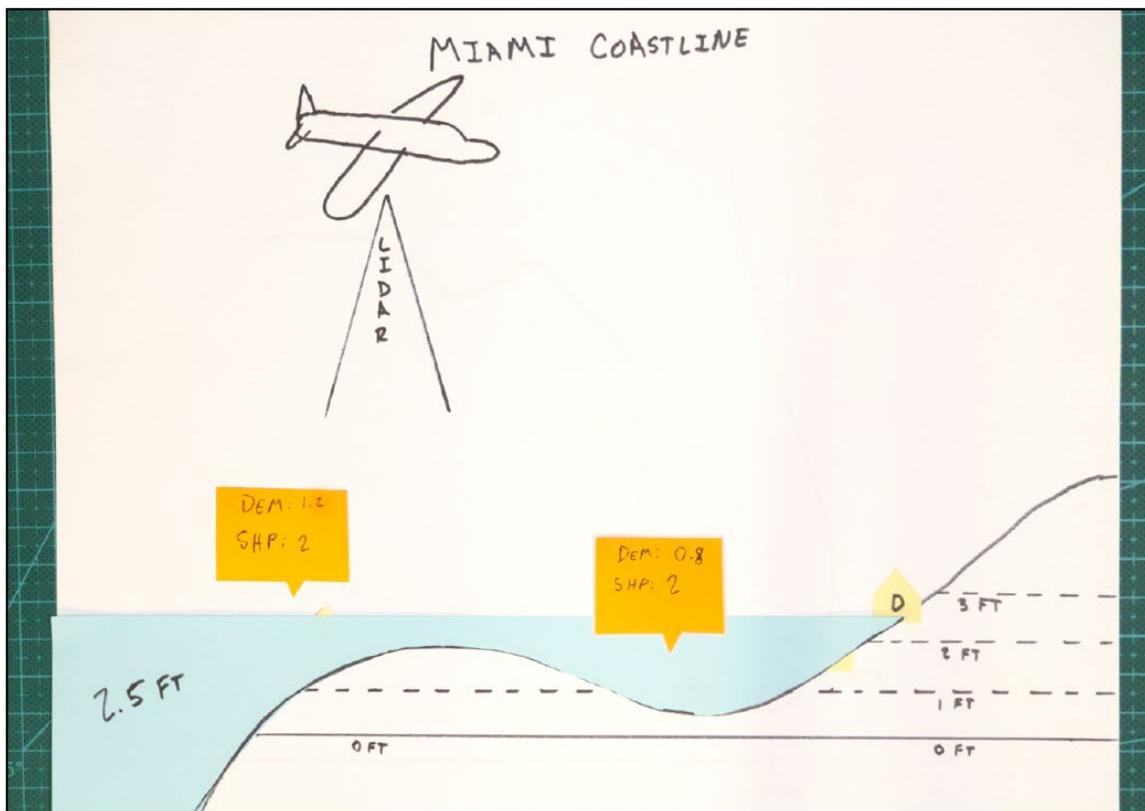


Figure: Miami Sea Level Rise and Housing Count Impairment



...a little humility doesn't hurt either.



Summary

- Climate change poses risks to regional and national economies.
- Both *physical* and *transitional* risks need to be taken into consideration in order to understand the effects of climate change.
- Climate change economics is an evolving field of study and economists need to work closely with their scientific counterparts in order properly assess climate risks.
- The Federal Reserve and other global central banks are working in earnest to understand climate risks and the associated economic outcomes.



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