

## Brace for Impact: Climate change warnings

Climate is a chaotic system, and chaotic systems tend to maintain an equilibrium for extended periods before suddenly shifting to a new state. We've seen this before; 12,800 years ago, global climate abruptly tipped into an ice age, with average temperatures dropping by 5-10 degrees Celsius in just a decade. What we are currently experiencing is not a slow, linear progression, but an accelerating rate of change that risks overwhelming our capacity to adapt.

**Evidence of Accelerating Impact:** The data is unequivocal:

- **Record Heat:** 2024 was the hottest year on record, concluding the hottest decade.
- **Rising Sea Levels:** Sea levels have risen half a foot since 1996, leading to "blue sky" flooding in coastal cities like Miami, where downtown buildings regularly flood with seawater.
- **Extreme Weather Events:**
  - Wildfires are devastating regions like California and western Canada.
  - Hurricane Harvey, in 2017, represented the third "once-in-500-year" flood in Houston within just three years.
  - Closer to home, the derecho storm that impacted our region on May 21, 2022, was one of Canada's costliest natural disasters, exceeding \$1 billion in insured losses. Its path stretched approximately 1000 km long and 100 km wide.
  - In 2024, Canada experienced its costliest year for insured losses in history, totaling \$8.5 billion in damages.

**The Financial Reality:** The property and casualty insurance industry, often at the forefront of assessing risk, is certainly taking notice.

- Average U.S. homeowners' insurance premiums rose 34% over five years (2017-2023).
- Reinsurance companies significantly increased their premiums by 45% to 100% in 2023 alone.
- In some vulnerable areas, such as Florida, Texas, and flood plains around the Ottawa River, insurers are now refusing to write policies at any price. This directly impacts homeowners' ability to secure mortgages.

**Preparing for What's Next:** While the news of climate change might feel "old," the escalating rate of change means we risk being caught unprepared. Preparation requires a multi-faceted approach:

- **Robust Municipal Infrastructure:** Support measures to make community infrastructure more resilient to floods, droughts, and violent storms. The City of Guelph's Climate Adaptation Plan, expanding tree canopies, improving emergency preparedness, and the Integrated Water Management Strategy are commendable steps.
- **Individual and Business Resilience:** Actively seek ways to make your home and business more climate-resilient. Engage in contingency planning to protect your family, business, and community.

This is a time for caution and proactive measures. We must consider the very real risk of disaster against the potential returns from assuming a continuously stable economy. We have the opportunity to prepare now, rather than being caught looking the wrong way when the future goes over a cliff.

## Sources for Climate Crisis Assessment

To verify the points made in the "Brace for Impact: Climate Change Summary" handout, you can consult the following sources:

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## Worzel / Climate

- **Global Temperature and Climate Data:**

- **NASA (National Aeronautics and Space Administration):** Provides comprehensive data and analysis on global temperatures, sea level rise, and other climate indicators. Look for their "Global Climate Change: Vital Signs of the Planet" section.
  - *Website:* [climate.nasa.gov](http://climate.nasa.gov)
- **NOAA (National Oceanic and Atmospheric Administration):** Offers extensive climate data, research, and reports on weather patterns, ocean conditions, and climate change impacts in the U.S. and globally.
  - *Website:* [www.noaa.gov/climate](http://www.noaa.gov/climate)
- **Copernicus Climate Change Service (C3S):** The EU's Earth observation program, providing consistent and authoritative information on the climate. They regularly report on global temperature records.
  - *Website:* [climate.copernicus.eu](http://climate.copernicus.eu)
- **IPCC (Intergovernmental Panel on Climate Change):** The leading international body for assessing climate change. Their assessment reports synthesize the latest scientific findings on climate change, its impacts, and future risks.
  - *Website:* [www.ipcc.ch](http://www.ipcc.ch)

- **Extreme Weather Events & Impacts (including Canadian data):**

- **NOAA National Centers for Environmental Information (NCEI):** Tracks billion-dollar disaster events in the U.S., providing data on frequency and costs.
  - *Website:* [www.ncdc.noaa.gov/billions/](http://www.ncdc.noaa.gov/billions/)
- **Environment and Climate Change Canada:** Provides data and reports on climate change impacts and extreme weather events specific to Canada.
  - *Website:* [www.canada.ca/en/environment-climate-change.html](http://www.canada.ca/en/environment-climate-change.html) (search for climate change reports)
- **Reputable News Outlets (citing scientific sources):** Major news organizations (e.g., Reuters, Associated Press, New York Times, Washington Post, BBC) often report on specific extreme weather events and their links to climate change, usually citing the scientific bodies above.

- **Insurance Industry Data:**

- **Insurance Bureau of Canada (IBC):** Provides data and analysis on insured losses from natural disasters in Canada.
  - *Website:* [www.ibc.ca](http://www.ibc.ca) (search for "catastrophic losses")
- **American Property Casualty Insurance Association (APCIA):** Represents the U.S. property and casualty insurance industry and often publishes data on trends in premiums and losses.
  - *Website:* [www.apci.org](http://www.apci.org)
- **Reinsurance Companies (e.g., Swiss Re, Munich Re):** These global companies publish annual reports and studies on natural catastrophe losses and the financial implications of climate change for the insurance sector.
  - *Websites:* [www.swissre.com](http://www.swissre.com) (look for "sigma" reports), [www.munichre.com](http://www.munichre.com)



## **Brace for Impact: The emerging crisis in U.S. finance / Futurist Richard Worzel, C.F.A.**

While the stock market often captures headlines, the true "ocean beneath the waves" of our financial system is the bond market. There are growing concerns that the U.S. government's financial standing.

**The Unsettling Reality:** For decades, U.S. Treasuries were seen as the safest investment in the world. This perception is now under threat due to a confluence of factors:

- **Soaring Debt and Deficits:** The U.S. federal debt currently stands at an unprecedented **\$36.6 trillion**. Annual deficits remain exceptionally high, even outside of major wars.
- **Exploding Interest Costs:** As interest rates rise (driven by inflation and market jitters), the cost of servicing this massive debt is escalating rapidly. Current interest costs are around **\$745 billion** annually, with projections from the Congressional Budget Office (CBO) indicating a potential rise to **\$1.2 trillion within the next 5 years** – a staggering 60% increase, just to cover interest.
- **Tepid Investor Demand:** Recent U.S. Treasury auctions have shown weaker-than-expected demand. Investors are demanding higher yields to compensate for perceived risks, forcing the government to pay more to borrow.
- **Foreign Holders' Actions:** Countries like Japan and China, historically the largest foreign holders of U.S. debt, may be selling off their holdings. China might do so to destabilize the U.S. or retaliate against trade policies, while Japan might act to protect its own economy. If major buyers step away, the U.S. would be forced to offer even higher interest rates, creating a dangerous feedback loop: higher rates lead to higher deficits, which require more borrowing at even higher rates.
- **Threat to the U.S. Dollar:** Normally, the U.S. dollar strengthens during times of crisis. However, recent trends have shown the dollar falling amidst concerns about fiscal stability. A loss of confidence could threaten the dollar's status as the world's reserve currency, a position that underpins much of America's economic power and allows it to borrow cheaply. Such a shift would precipitate an even greater crisis.
- **The Debt Ceiling Sword of Damocles:** The recurring political battles over raising the U.S. debt ceiling pose an existential threat. A failure to raise the ceiling would lead to a U.S. government default on its obligations, an unprecedented event with catastrophic global financial consequences.

**Potential Impact:** If these trends continue and accelerate, the "impact" could be severe:

- **Skyrocketing Borrowing Costs:** For the U.S. government, businesses, and consumers.
- **Financial Instability:** Potential for bond market crashes and widespread loss of confidence.
- **Economic Downturn:** A financial crisis on par with, or even exceeding, the Great Depression of the 1930s.

**What to Watch and How to Prepare:** While no one can predict the exact timing, the risks are clear.

- **Look Beyond Headlines:** Focus less on daily stock market fluctuations and more on the underlying trends in the real economy and, crucially, the bond market.
- **Fiscal Responsibility:** Pay attention to policy decisions regarding government spending, taxation, and the debt ceiling.
- **Personal and Business Prudence:** Consider the risks of being overextended. This is a time to prioritize financial resilience and contingency planning for your family and business.

Everything will be fine – until it's not. By understanding these potential impacts, we can better prepare and navigate the future.

### **Data sources for U.S. Government Finance Assessment**

- **U.S. Federal Debt, Deficit, and Interest Costs:**

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## Worzel / US government finances

- **U.S. Treasury Department (TreasuryDirect):** The official source for information on U.S. government securities, including the current national debt.
  - *Website:* [www.treasurydirect.gov](http://www.treasurydirect.gov) (look for "The Debt to the Penny" and "Interest Expense on the Debt")
- **Congressional Budget Office (CBO):** A nonpartisan agency that provides economic and budgetary analysis to the U.S. Congress. Their reports offer projections for debt, deficits, and interest costs.
  - *Website:* [www.cbo.gov](http://www.cbo.gov) (look for "Budget and Economic Outlook" reports)
- **Federal Reserve Bank of St. Louis (FRED database):** A vast and publicly accessible database of economic and financial data, including various U.S. Treasury yields, debt figures, and other relevant indicators.
  - *Website:* [fred.stlouisfed.org](http://fred.stlouisfed.org)
- **Treasury Auctions and Investor Demand:**
  - **U.S. Department of the Treasury:** Publishes detailed results of all Treasury auctions, including bid-to-cover ratios and yields.
    - *Website:* [home.treasury.gov/policy-issues/financing-the-government/treasury-auctions](http://home.treasury.gov/policy-issues/financing-the-government/treasury-auctions)
  - **Major Financial News Outlets:** Reputable financial news sources (e.g., Reuters, Bloomberg, Wall Street Journal, Financial Times) regularly report on Treasury auction results and market sentiment.
  - **Market reaction to increased debt load:**  
<https://www.reuters.com/business/tepid-demand-us-treasury-auction-shows-investor-jitters-about-tax-bill-deficit-2025-05-21/>
- **Foreign Holdings of U.S. Debt:**
  - **U.S. Treasury Department (Treasury International Capital (TIC) System):** Provides monthly data on foreign holdings of U.S. securities.
    - *Website:* [home.treasury.gov/data/treasury-international-capital-tic-system-data](http://home.treasury.gov/data/treasury-international-capital-tic-system-data)
- **U.S. Dollar Index (DXY):**
  - **Major Financial Data Providers:** Websites like Trading Economics, MarketWatch, and Bloomberg provide real-time and historical data for the DXY.
    - *Examples:* [www.tradingeconomics.com/dxy:cur](http://www.tradingeconomics.com/dxy:cur),  
[www.marketwatch.com/investing/index/dxy](http://www.marketwatch.com/investing/index/dxy)
- **Debt Ceiling:**
  - **U.S. Treasury Department:** Provides official statements and updates on the debt limit.
    - *Website:* [home.treasury.gov/](http://home.treasury.gov/) look for "Debt limit"
  - **Congressional Budget Office (CBO):** Publishes analyses on the implications of the debt limit. *Website:* [www.cbo.gov](http://www.cbo.gov) (search for "debt limit" or "debt ceiling")
- **Fiscal vs. Monetary Policy Contradictions:**
  - **Federal Reserve (Speeches and FOMC Minutes):** Statements and meeting minutes from Federal Reserve officials often discuss the interplay between fiscal and monetary policy.
    - *Website:* [www.federalreserve.gov](http://www.federalreserve.gov)
  - **Economic Think Tanks and Academic Institutions:** Organizations like the Brookings Institution, American Enterprise Institute (AEI), Peterson Institute for International Economics, and university economics departments publish research and commentary on macroeconomic policy.