Climate, Chaos, and Politics

Scott Crosby

Relevant Background

Study of Politics – since age 10, 1962
B.S. degrees – Mathematics, Computer Science (dual), 1974
Study of Objectivism – since 1976
Pilot, Study of the Weather – since 1986; 2600hr (IFR since 1988; 500hr)

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Climate, Chaos, Politics

Metaphysics – Existence

- The Weather and Climate You Live In

Epistemology – How to know what will happen

- Forecasting your Weather and Climate

Ethics – Why People Do What They Do

- Follow the Weather and Climate Money

Politics – Your Political Environment

- Weather and Climate as a Political Tool

The Weather and Climate You Live In

Sources of influences on Earth's Climate

- Earthly
- Solar
- Cosmic
  - Within the Solar System
  - Outside of the Solar System

The Weather and Climate You Live In
Earthly Influences
Unknown and Unpredictable

- internal warmth
- causes of volcanic eruptions and the degree of impacts
- drift of the magnetic north pole (from north Canada to north Russia)
- continental drift (movement of tectonic plates)
- severity of hurricanes
- the levels of precipitation and cloud cover
- changes in Earth's average temperatures and CO_2 levels
- Clouds – insulate Earth's surface
  - Day: reflect heat, light away into space
  - Night: retain heat, light between clouds and surface

The Weather and Climate You Live In
CO2 and Temperature

Changes in the Earth's average temperature and CO2 levels cannot be correlated to each other, or to other factors, excepting during large volcanic eruptions such as occurred during the Younger Dryas period, about 13,000 - 11,500 years ago.

CO2 levels have been particularly low for the past five million years, and (for plant life) dangerously low during the Ice Ages of the past million years.

There is a direct correlation between CO2 levels, plant growth, and food supply.

The Earth has been **growing greener with the increased levels of CO2**.

Temperatures have been unusually low for the past four million years.

Temperatures began dropping further for unknown reasons about 1275, hitting a minimum about 1650. Temperatures have been recovering since then, but are **still colder than prior to 1300**.

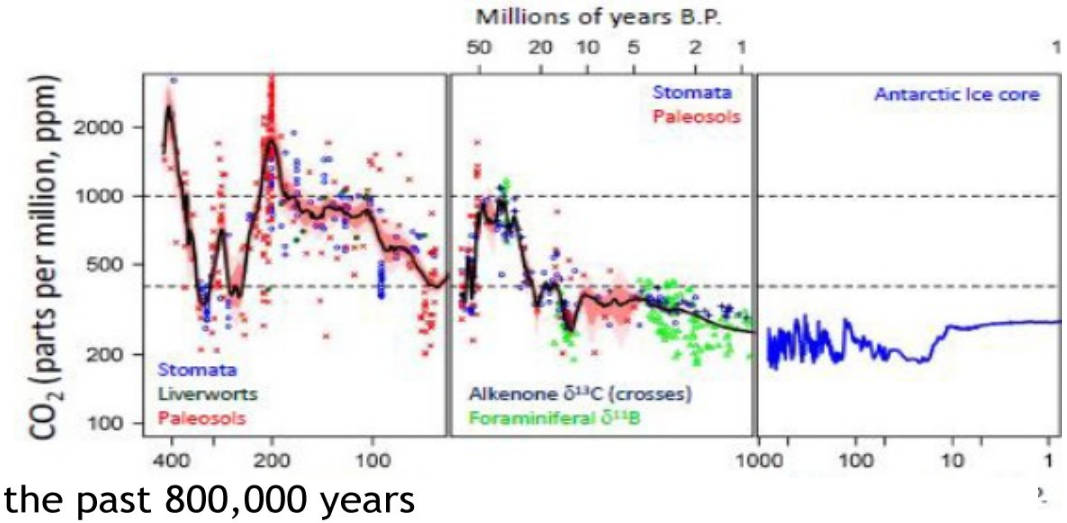
See: https://www.scottschoice.com link to my article "**The Earth is Getting Greener**"

The Weather and Climate You Live In

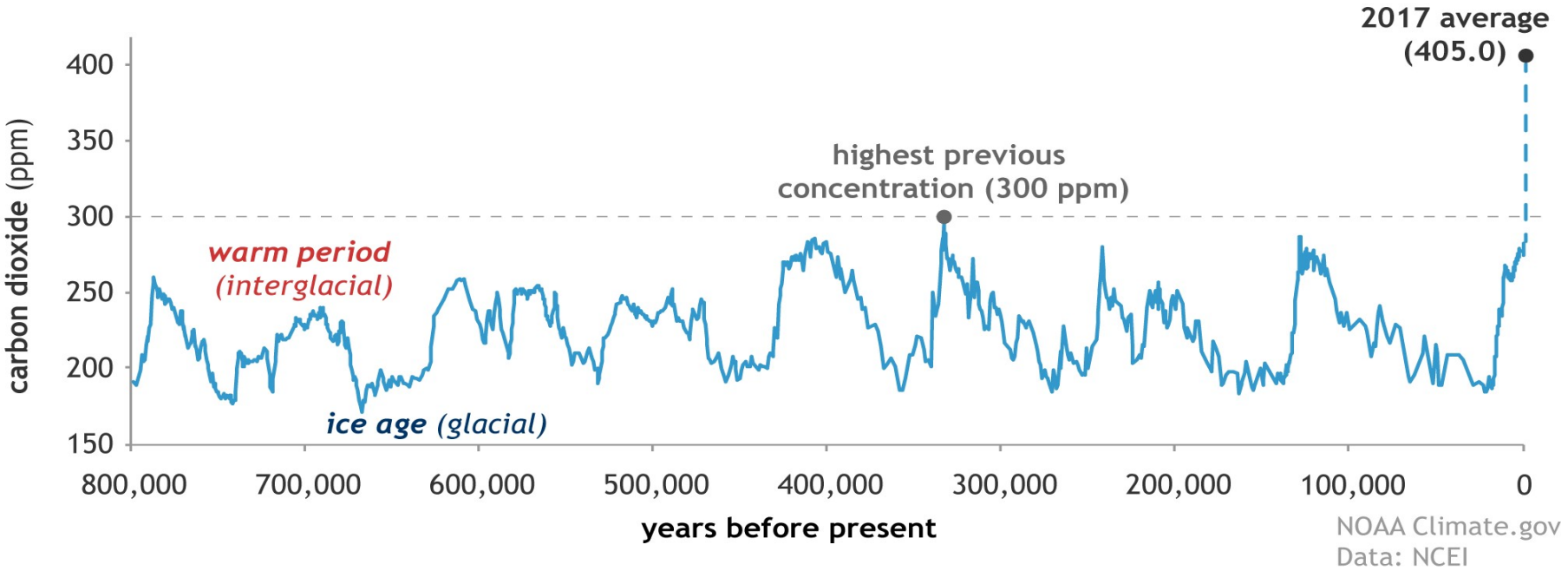
CO2

long-term

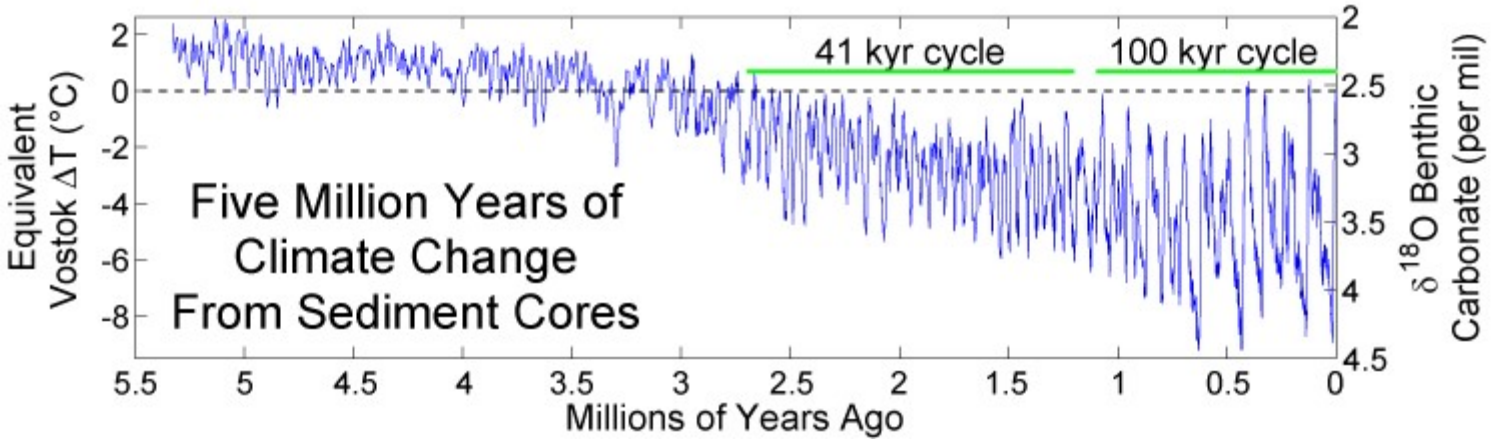
and recent

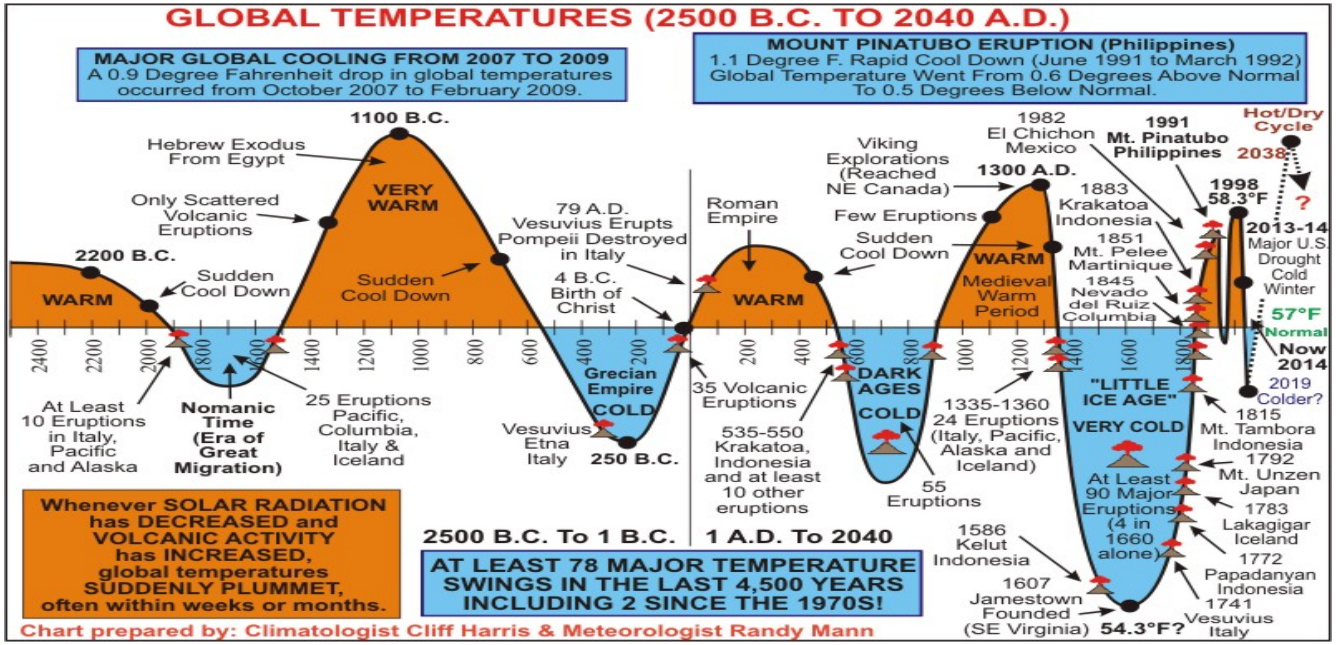


CO_2 during ice ages and warm periods for the past 800,000 years



The Weather and Climate You Live In Temperature – long term and recent





The Weather and Climate You Live In
Solar Influences

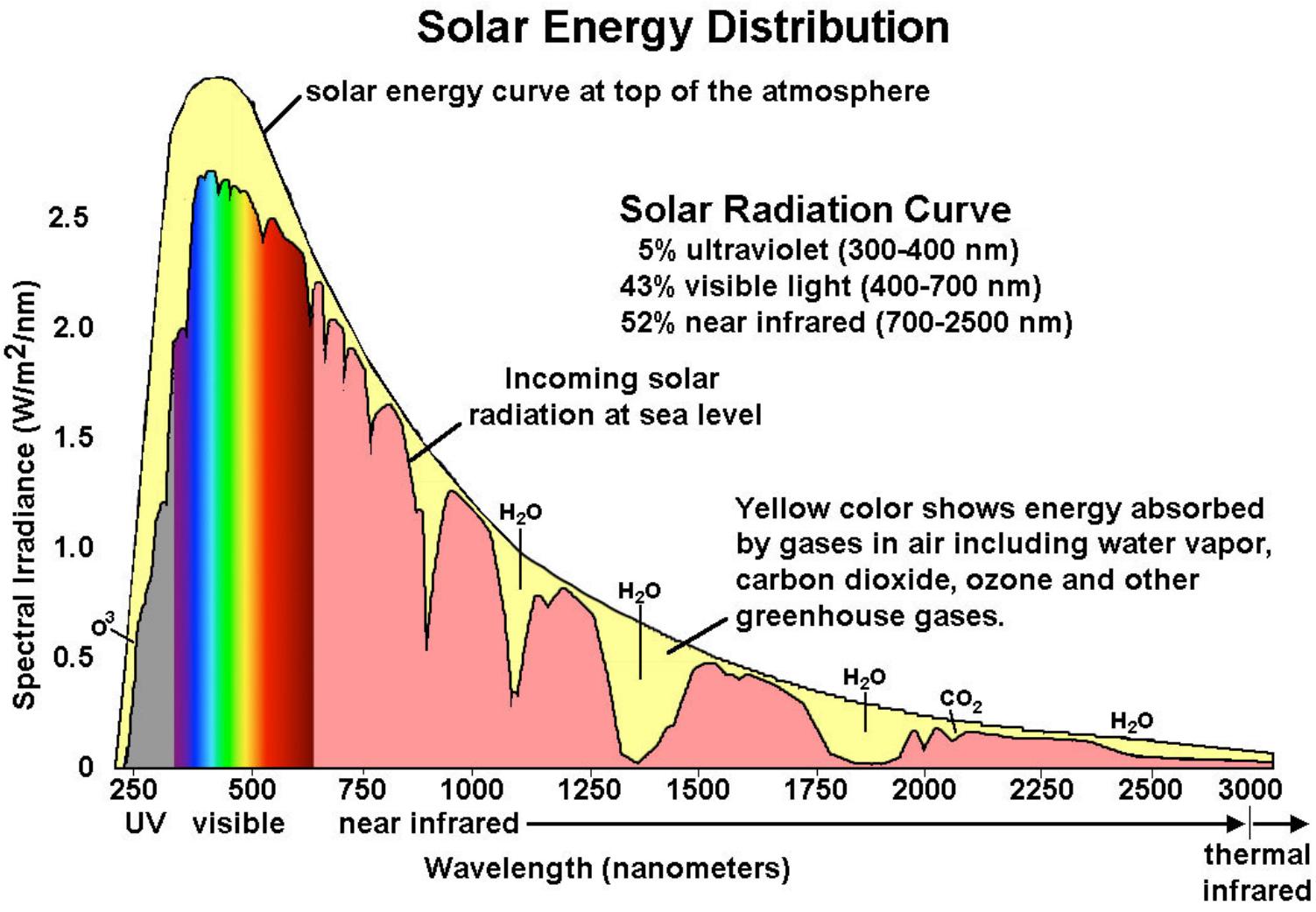
The positions of the Earth's poles change
relative to the Sun and
relative to the Earth's distance from the Sun
due to Earth's location in its elliptical orbit
and planetary "wobble".

- Perturbations of the Earth's orbit around the Sun due to gravity of other planets.

The Sun is a "variable star".

- Variations occur in the Sun's output of light, heat, and other radiation

The Weather and Climate You Live In
Solar energy – WHEN? Mid-day



The Weather and Climate You Live In
Cosmic influences – Extinction Events

Within the Solar System

- Meteor impact that killed most of the dinosaurs and most life on Earth 65 million years ago
- "Short" Ice Age due to the meteor impact at the start of the Younger-Dryas period about 12,000 years ago
  - drove first development of agriculture (in Mideast)
- The orbital movements of other planets affect Earth's orbit
  - especially Jupiter (largest)

Outside the Solar System

- Radiation from the supernova of a nearby star
  - 160 light-years distant
  - 2.6 million years ago
  - killed large mammals in shallow waters

Your Weather and Climate Tomorrow

Forecasting

- Weather and Climate are synonymous
- Scientific Prediction of the Weather
- Statistical Modeling and Chaos Theory
- Work-arounds
  and Seeing Through the Smokescreens

Scientific Prediction

Acceleration, Velocity, Distance
of a falling object **due to Earth's gravity**

$a = -32$ velocity (speed) **accelerates *downward*** increases by 32 **ft./sec. *downward*** every second

(32 ft./sec. = about 21.8 mph)

$v = -32t + v_o$ **velocity increases over time ("t")** beginning with its initial velocity (up or down)

$d = -16t^2 + v_o t + d_o$ **distance changes over time** beginning with its initial distance (above Earth)

Scientific Prediction of the Weather

– Reference Point vs. Typical Forecasts –

Email: to You

Date: 8 May

Subject: Requested Weather Forecast for 8 August

You have requested the weather forecast for your backyard (based on your GPS location) on Saturday, the 8th of August, three months from today. A light rain will occur from 4:02am to 6:38am that morning, with the clouds dissipating afterward to scattered and clearing by 9:12am. Sunny skies and low humidity can be expected for the rest of the day, with a few small clouds in the evening, beginning at 6:14pm. One cloud will pass in front of the sun at 6:42pm, with the shadow covering your backyard for two minutes. Two other clouds will pass over neighboring homes, at 6:32pm and 6:35pm respectively. Winds will be light and from the southwest all day. The low temperature will be 68 degrees, at 6:17am, and the high temperature will be 86 degrees, at 4:06pm.

If needed, see our website **here** for more detailed information.

Statistical Modeling

- Scientific Prediction of the Weather
  is not possible – cannot establish causality
- Alternative: using Statistics
- What are Statistics?

  Statistics are a record – a historical, numerical record of what has already occurred; nothing more.
- Accuracy of Statistical Modeling
  - Using the past to forecast the future.
  - How often is the future just like the past?

Statistical Modeling

Accuracy of Statistical Modeling

Mathematician - turned - meteorologist Edward Lorenz began his weather forecasting career during World War II.

In 1961, Lorenz discovered that even a small change in the values entered in a model resulted in a radically-different forecast.

"An acceptable prediction of an instantaneous state in the distant future may well be impossible. In view of the inevitable inaccuracy and incompleteness of weather observations, **precise very-long-range forecasting would seem to be nonexistent**."

The United Nation's own **Intergovernmental Panel on Climate Change**, in 2001 stated:

"**Climate has always varied on all time-scales**"

"Many factors continue to limit the ability to detect, attribute, and understand current climate change and to project what future climate changes may be."

"The long-term prediction of future climate states is not possible."

How distant is "long-term"?

About *three days*.

Chaos Theory
A Mathematical Discipline to Resolve Complexity via Statistical Modeling

Weather varies hour to hour; day to day; month to month; year to year; century to century; ad infinitum. **Earth's climate is constantly changing** – due to natural causes.

With so many unknowns about what causes the weather, **causality cannot be established** – i.e., *scientific* prediction is not possible.

Therefore **statistical modeling** – with its massively complex equations – is presented as a viable alternative means of predicting the weather and climate.

Statistical modeling developed into **Chaos Theory** in the 1980s – with an explicit focus on attempting to use the past to forecast the future.

All forecasting, whether for near-term weather forecasting or for climate change in some more-distant future, is based on the use of Chaos Theory equations to develop predictions in the case of too-great complexity.

The use of statistics to forecast the future is identical to trying to drive your car solely by looking in the rear-view mirror.

Chaos Theory

Work-arounds and Smokescreens

A simple <u>daily</u> forecast does not work:

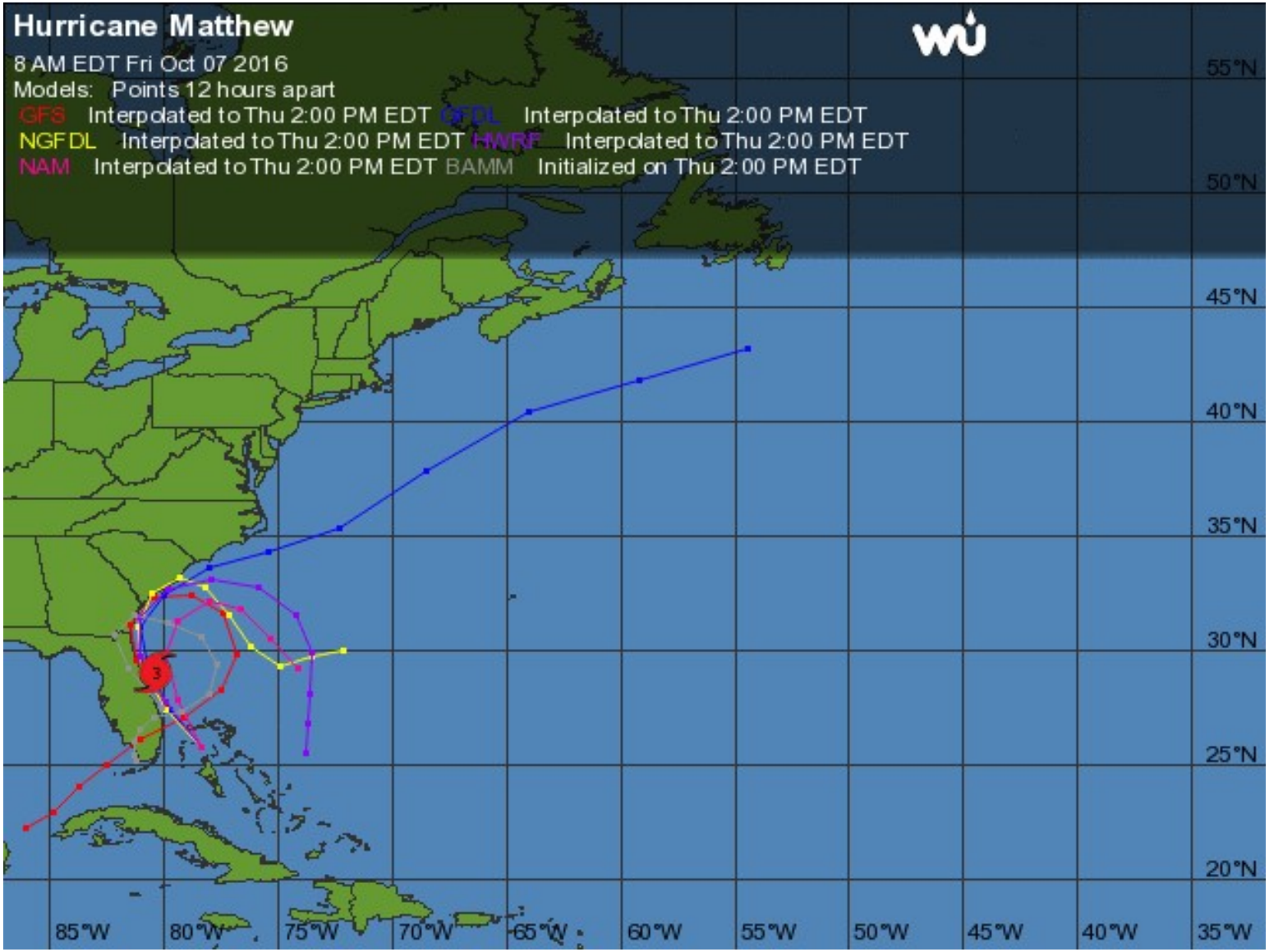
– "*stray*" ??

… implicitly ***proving***
Weather and Climate forecasting does not work.

When Chaos Theory does not work, resort to:

- Ensemble Forecasting (re: Hurricane Matthew)
- Averages – ***<u>not</u>*** scientific

Ensemble Forecasting



Chaos Theory

If Chaos Theory actually worked:

- Weather predictions
- Stock-market predictions
- Political elections predictions

… would be possible.

And human beings would be robots.

Does anyone see WHY?

Climate, Chaos, and Politics: Why is there a connection?

The Special-interest Groups:

- **Meteorologists and Climatologists**
  - Better forecasting accuracy; jobs
- **Chaos Theory Mathematicians**
  - Grants, salaries, jobs, tenure, personal interest
- **Politicians**
  - Power – everyone wants weather forecasting;
    - Chaos equations sound authoritative.

Climate Change: Political Tool

Debunked – Factors and Issues

- Politicians' attitudes – necessary but dangerous
- Politicians' Rules to increased power
- Tip of the Spear –

  Climate change is a plausible path to limiting freedom and increasing political power
- Foreign Politicians – self-interest, anti-American
- The U.S. Constitution – bulwark against dangers

Climate Change: a Political Tool

- "Politics" is synonymous with "Relationships"
  - "Politics" is more than just "Capitalism"
  - Capitalism is derived from elementary relationships

- You are living in a political environment;
  not to be ignored – your life requires action.
- Action requires knowledge: facts and,
  in this case, the political environment you live in.

Climate, Chaos, and Politics

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Authoring-Writing website
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Climate webpage:
http://climate.scottcrosby.info

Homework:

Weekly Forecast webpage – contains *five* sets of forecasts:
http://www.scottcrosby.info/weather/week_forecast.html
Save forecast for the seventh day, note accuracy when that day arrives.
Repeat as often as you like.