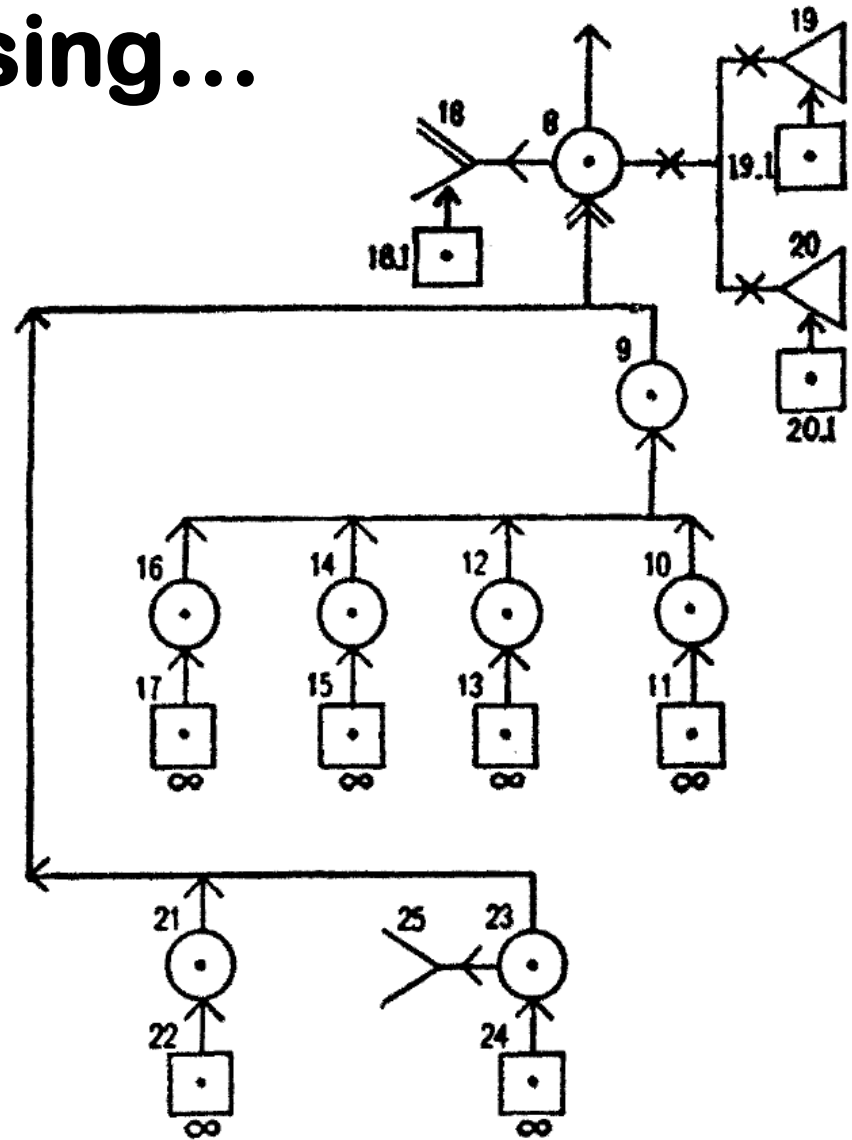


Critical Thinking Using...

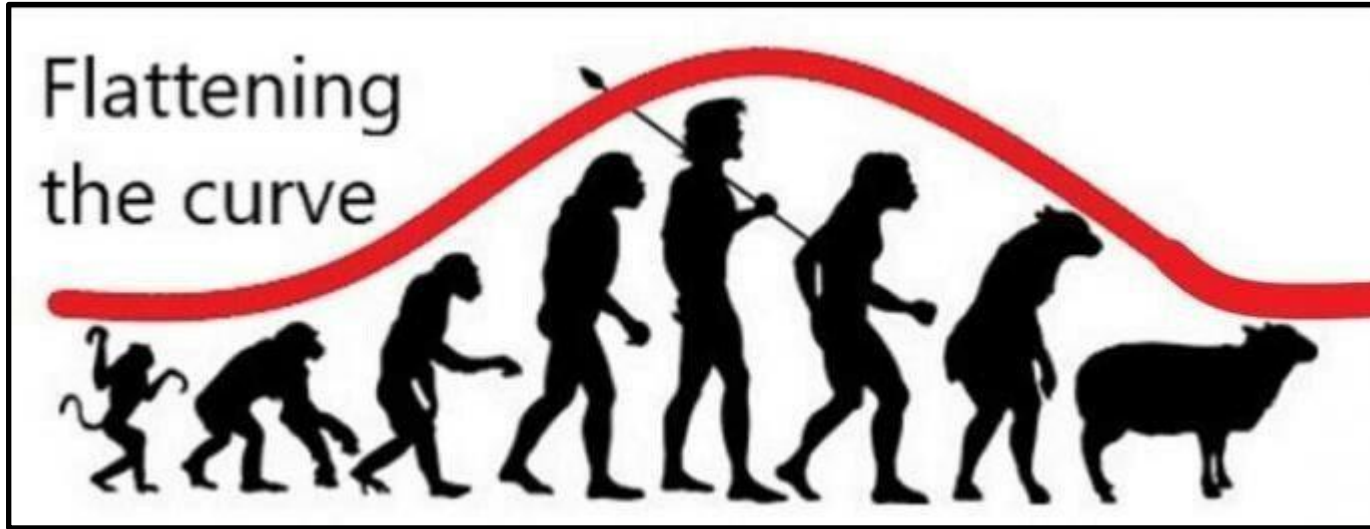
Wigmore's Trial Charting Method...

Examining the Climate Extremist Argument

Dave Tofsted, Ph.D.



Is America Losing It's Critical Thinking Skills?



- We often hear talk about the importance of Critical Thinking.
- But WHAT EXACTLY is CRITICAL THINKING?
- Is it being taught in US schools?

Is Critical Thinking Merely Being Critical?

- ❑ Answer: No. Not even close.
- ❑ Yet in New Mexico, Critical Thinking is often connected to Leftist Causes...
- ❑ “Critical Thinking” is mentioned in the NM Social Studies Standards...
[webnew.ped.state.nm.us/wp-content/uploads/2022/02/NM-Standards-508.pdf]
 - These standards were developed with the following ... principles in mind:
 - Incorporating ... themes such as power, class conflict, struggle, ... social justice, ... equity and diversity ...
 - Developing student agency and leadership, employability skills, ***critical thinking applied to histories, stories, and the long-term impact of political decisions***

More of NM PED's Concept of Critical Thinking

- Diverging from a singular Eurocentric cultural script, ensuring ***equitable inclusion*** of accurate historical stories reflecting Indigenous, Hispano/Latino, Chicano, Mestizo, Genizaro, African American, and other cultural perspectives
- Identifying tools to ... study [the] relationship between ***power and oppression***
- [Develop] strong ***critical*** historical consciousness representative of many perspectives while allowing students to maintain their own cultural integrity
- Empowering students to develop pride in their identity, history, culture, and region ...
- ***Developing a future-focused orientation that allows students to be critical thinkers in considering historical context in mending, healing, and transforming future interactions***

QUESTION: Is this really what Critical Thinking is ALL ABOUT?

What Then Is Critical Thinking?

- ❑ Critical Thinking is often associated with the Scientific Method. But it's not science itself. Instead, it's the "PRAXIS" or the underlying WAY we DO SCIENCE.
- ❑ Often we think of SCIENCE (as science) as DEFINITIVE. ("Follow the Science.")
- ❑ That is, we think that in SCIENCE there must always be only **one** RIGHT ANSWER.
- ❑ BUT IF Science were defined that way, we could simply rely on FACTS and DEDUCTIONS.
- ❑ But that's not how science works. SCIENCE typically involves INDUCTIVE METHODS (piecing together tiny bits of information to INFER a complete PICTURE of (often) just a tiny portion of REALITY).

Science as a Form of Critical Thinking

- ❑ Because in science we often don't have the answers UP FRONT, we don't "DO SCIENCE" by DEDUCTION.
- ❑ Instead, we piece together the TRUTH to come to conclusions. This is what CRITICAL THINKING IS ABOUT. Think of CRITICAL THINKING as an organized WAY of piecing together information to get at TRUTHS.
- ❑ Example: Our understanding of our own Solar System had developed over many centuries as we TESTED the "TRUTH" (or falsehood) of various MODELS of how our Solar System worked. (Earth centric, Flat Earth, etc.)
- ❑ Today's understand that the planets orbit the Sun in elliptical orbits took centuries! to achieve.
- ❑ Often, SCIENCE involves ABDUCTIVE METHODS (ELIMINATING WRONG hypotheses), leaving only a BEST GUESS that is as to the truth as we can get. (For example, Newton's laws of gravitation)

Induction

- ❑ Besides ABDUCTIVE METHODS, there are also INDUCTIVE METHODS
- ❑ When using INDUCTIVE METHODS we are both BUILDING hypotheses based on guesses **and then** Checking these Guesses against Data.
- ❑ Thus, most SCIENCES are more like solving mysteries or crimes than GEOMETRY – a system built on a series of AXIOMS (assumed truths) that then point to a series of provable results.
- ❑ In most cases we attempt to see if our INDUCED HYPOTHESES also produce EXTRA PREDICTIONS.
- ❑ We then verify a Hypothesis based on the Strength of these extra predictions that can be shown to be true.

Wigmore's Charting Method: An Aid to Doing Critical Thinking

❑ Who was Wigmore?

John Henry Wigmore was a legal scholar at Northwestern University's Law School. His key interest was in understanding the STRUCTURE of LEGAL ARGUMENTS used at Trials.

In 1913, a Law Professor proposed a "Method" to CHART the structure of LEGAL ARGUMENTS in trials, capturing the structure of the evidence used by prosecuting (and defense) lawyers to prove or disprove cases.

- ❑ The Wigmore method involved organizing the facts of a trial into a logical structure to see how the prosecutor "built his solid case."
- ❑ The method also featured elements of the defense's case that acted to mitigate or refute the prosecution's case.

Wigmore's Charting Method

Connection to Scientific Analysis

- ❑ In a legal sense, the “facts” of a case are often built upon the foundation of witness testimony that can be impugned, or circumstantial information, in addition to direct evidence necessary for a conviction.
- ❑ Obviously, such a system would also be conducive when intercomparing various competing “Working Hypotheses” when seeking an overall BEST choice.
- ❑ A Chart is also an easy way to see the Logical Connections between various elements of a complicated PROOF or CONJECTURE.
- ❑ Why? Because an audience can become confused when presented with a series of facts. They can be helped to UNDERSTAND/COMPREHEND the overall thrust of an argument if they can see how the various pieces FIT TOGETHER.

Wigmore's Symbolism Method

- ❑ Wigmore's system was both an organizational method and also a system based on a series of SYMBOLS designed to simplify understanding of the elements that combined together to explain the course of a legal trial structure.
- ❑ Of course, when a trial occurs there are usually two sides to the story. The first side is the Prosecution's Case. This is represented in Wigmore's system by a series of symbols and lines advancing upwards throughout a diagram leading to the desired Conclusion (Guilty Verdict) at the Top.
- ❑ Along the way upwards, various additional symbols appear that impinge onto the main line of argument from both sides involving contradictory Defense evidence.
- ❑ The connections between these different symbols illustrates and illuminates the significance and weights of the different arguments.

(Derived from Jean Goodwin, 2000, "Wigmore's Chart Method," *Informal Logic*, Vol. 20, No. 3 (2000), pp. 223-243.

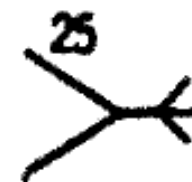
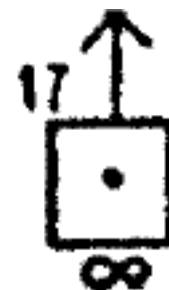
Wigmore's Charting Symbols

- ❑ **LINES:** Lines represent the logical connections representing the “pathways” of probative information connecting elements in the structure of the trial. Lines thus can represent the logical connections between premises, supporting data, lemmas, and theorems in a scientific context. In Wigmore’s method, lines represented connections in the structure of prosecutor’s proof of guilt and the defense’s argument for innocence.
- ❑ **ARROWS:** The basic processes of reasoning throughout the “proof” involve arrows that point upwards from Premises & Sub-Conclusions toward the prosecutor’s ultimate conclusion of guilt.
- ❑ **CIRCLES:** The most generic FACTs in the system represented essential PREMISES in the trial.
- ❑ **OTHER SHAPES:** Various other elements of the trial (proof) were represented by different shapes involving testimony of witnesses and exculpatory claims introduced by the defense. Most of the “data” of the trial involved witness testimony. Each Shape was then assigned a number that would be explained further in the comments.



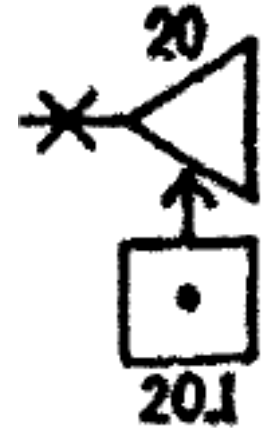
More Wigmore Charting Symbols

- ❑ **Squares:** Squares were used to denote **assertions** made under oath.
- ❑ **Dots Inside Shapes:** In addition to the description of each “Fact” associated with a numbered paragraph (17 in this example), the trial analyst may also insert their own sense of the strength of each element of the diagram. Choices involved - Doubt (“?”), Belief (“•”), Stronger Belief (“••”), Disbelief (“◦”), or Stronger Disbelief (“◦◦”).
- ❑ **Triangles:** Triangles represent (essentially) asides - Explanations of facts provided, or in the case of the opposition in the case, Refutations of Facts. Triangles are always oriented sideways to point toward the line of logic they either support or weaken.
- ❑ **Exculpatory Explanations:** “Facts” (i.e., Alibis and other Exculpatory explanations that tend to weaken the prosecution’s case appear as triangles with their base empty and an arrow aiming toward them to denote a weakening of the main argument.
- ❑ **Refuting Explanations:** “Facts” that counter exculpatory information are represented as triangles with an “X” along the path to the main argument.

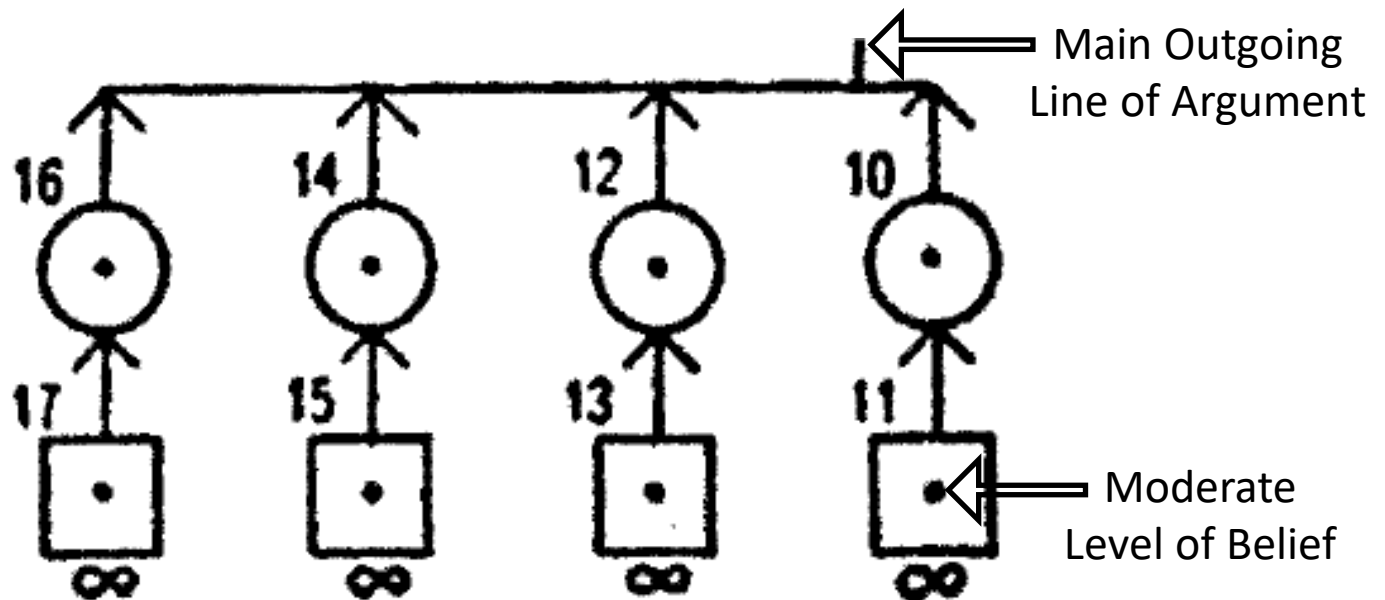


Wigmore Charting Combinations

❑ **Example:** For example, the combination of symbols on the right would be appropriate to express the Refutation of a Defense involving accompanying testimony (20.1).



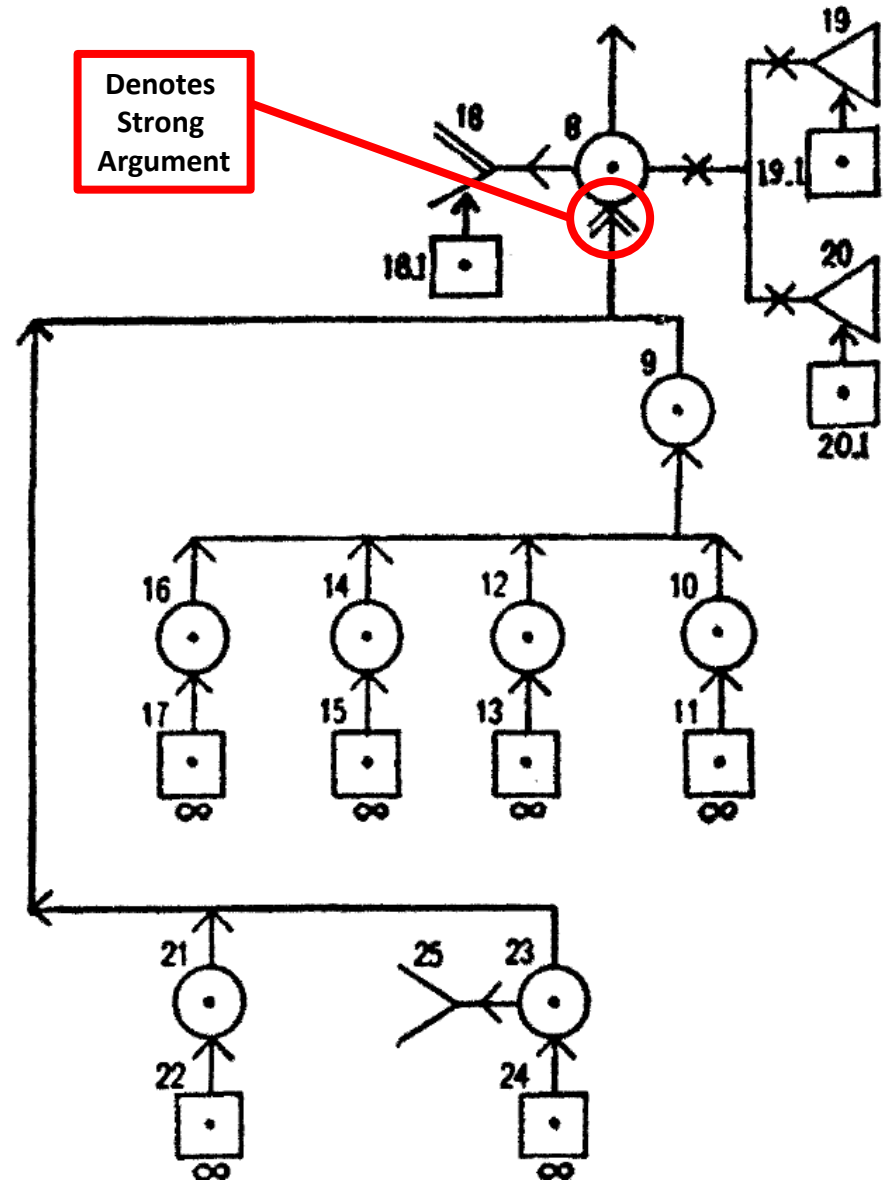
❑ **Combined Arguments:** Wigmore also permitted multiple lines of converging arguments to support a single line of argumentation.



❑ **Witnessed Symbol:** The ∞ symbols beneath Squares represent in-person (jury-witnessed) testimony during the trial.

Wigmore's Main Case Diagram

- ❑ The main features of the “case” example at the left involve a series of fact witnesses (11, 13, 15, 17) that established elements of the state of the relationship between the accused and the victim.
- ❑ These witnesses lead to a series of premises (10, 12, 14, 16) that established the overall motive for the crime (9).
- ❑ However, one element of the prosecution’s case was weakened by a conflicting explanation at 25.
- ❑ In addition, the defense raised an exculpatory argument at 18. That objection was then addressed by the prosecution’s additional witnesses at 19.1 and 20.1 and arguments 19 and 20 based on that testimony. Note that the strength of the argument leaving 8 was weaker than when it arrived from 9 & 21, before 18.



Operational and Observational Sciences

- ❑ **Scientific Divisions:** Most sciences have two separate “divisions:”
 - An **Operational Science** where *laws* have been formulated, usually described by mathematical equations.
 - An **Observational Science** where *effects* occur in nature under *nonrepeatable conditions* because observations made in “Nature” often involve multiple confounding or conflating influences, and where repeatable observations are not possible (weather state, unique archaeological site, Super Nova event).
- ❑ **Operational Sciences** can be studied in a laboratory through repeated experiments where confounding influences can be systematically eliminated or minimized.
- ❑ **Observational Sciences** can usually only be studied by observing a complete process in action.
- ❑ **Example:** In meteorology, although the set of governing equations called the Navier-Stokes equations are known, this set of non-linear equations cannot be “closed” to obtain exact solutions in most cases. Also, radiative interactions (e.g. heating from the Earth’s surface) interact with the flowing atmosphere in exceedingly complex ways, influencing any specific weather state outcome. Such interactions can only be guessed at.

Science Connections to Wigmore

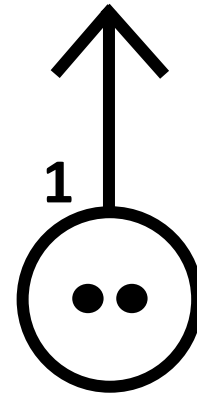
- ❑ **The Forensic Sciences** (criminology, archaeology, paleontology, astronomical studies of distant objects, biological understandings of the distant past) often involve invoking evidence where inferences to causes, models, or witness testimony are used.
- ❑ **Statistical Analysis:**
 - Often, in lieu of stated **LAWS**, scientists resort to *rules* formulated on the basis of Statistics. These often come out to be **workable solutions** rather than results based on **first principles**.
 - Typical Statistical Methods include **Regression Analysis** using *curve fits* to data effectively producing results amounting to **Best Explanations**.
- ❑ **Example:** Weather Prediction Models use a series of approximations. Where known relationships (Boyle's Law, Newton's Laws of Motion, etc.) are not available (e.g., cloud effects are "parameterized"). Nudging Factors are used to account for variable influences by slightly varying known laws through the addition of adjustable multiplicative or additive factors that move the model results closer to observations.
- ❑ **Calculating Nudging Factors:** Nudging factors are estimated by running models multiple times and comparing the results to observed data.
- ❑ **Wigmore's Diagrams** use diagrammatic forms for studying analogous explanatory processes by weighing various evidence.

Wigmore, Critical Thinking, & Inference to the Best Explanation

- ❑ In many cases of interest in science, politics, business, or life in general, **Multiple Potential Causes** exist for a given phenomenon, or **Multiple Courses of Action** are possible, the method of **Inference to the Best Explanation (IBE)** or **Inference to the Best Solution (IBS)** will often be useful.
- ❑ **IBE** provides a *Doctrine* for deciding which explanation is best that involves weighing various explanations to find which have stronger arguments.
- ❑ **IBS** could provide a similar *Means* for deciding the best among a series of possible courses of action, especially when significant costs are involved.
- ❑ **Wigmore's Diagrams** allow evidences to be compounded and objections to be categorized visually to allow comparisons of argument components and specific objections to be identified.
- ❑ The **Wigmore Charting System** provides an effective means for diagramming the course of an **IBE** investigation or an **IBS** decision to be made.
- ❑ Thus, **Wigmore's** approach to **Critical Thinking** has general application for developing ways of thinking about solving problems.
- ❑ As an example, let us consider how this applies to the case of Climate Alarmism...

Climate Catastrophism “Science” and Wigmore

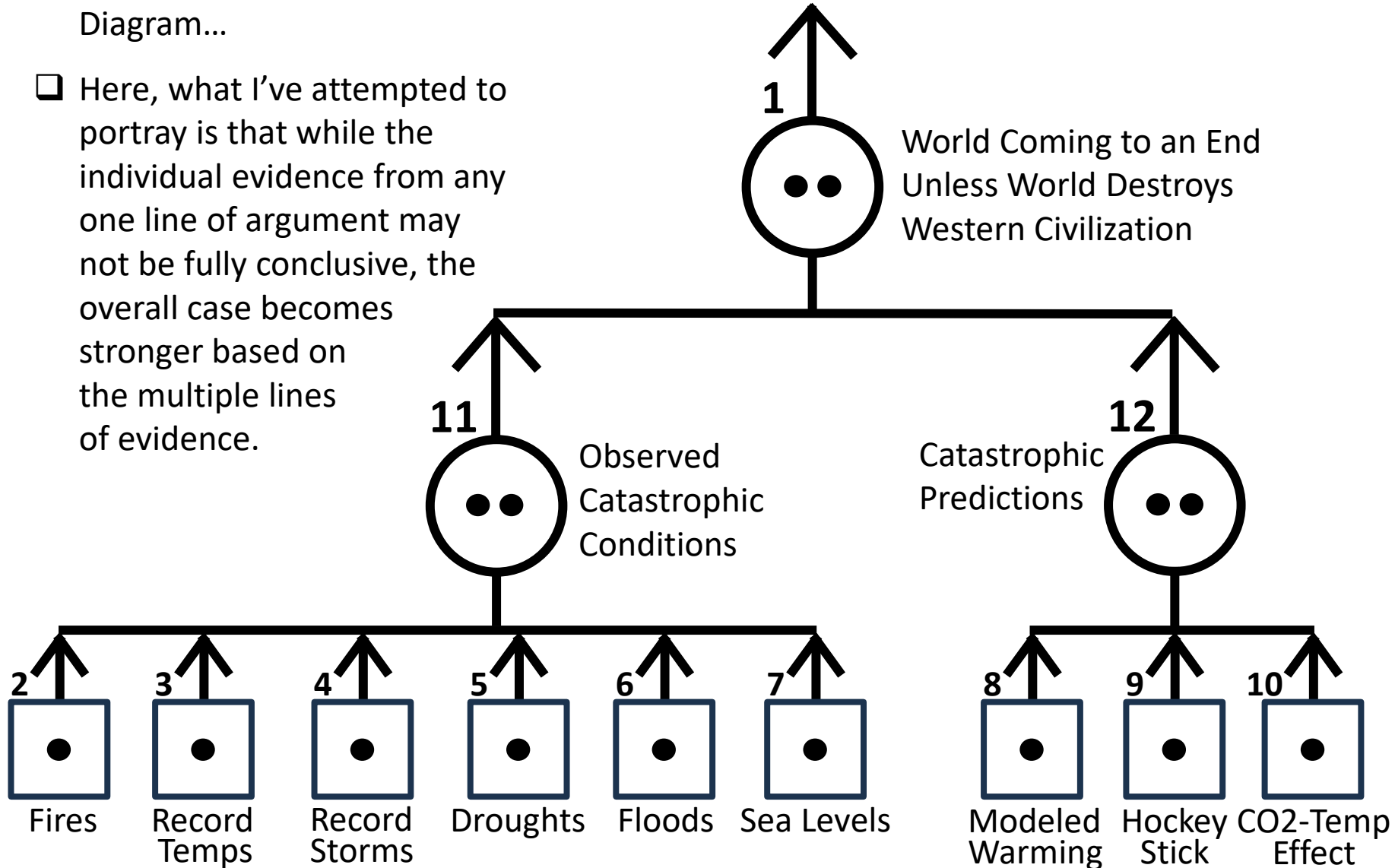
- ❑ How does the Climate Crisis! model fit into Wigmore’s Diagrams?
- ❑ Can we model this argument in terms compatible with Wigmore’s Diagrams?
- ❑ Let us begin with the Climate Alarmist’s desired conclusion...
- ❑ Here, **1** is the conclusion that the Earth is burning up due to human-caused global warming. And unless we take drastic measures the planet is doomed. The double-dots in the center infer that this is position is beyond question (“The Debate is Over.”).
- ❑ Next, let us look at their lines of argument upon which they base this conclusion...
- ❑ **2** – Record forest fires. Record extreme weather conditions, including **3** – record hurricanes, **4** – record tornados, **5** – record droughts, **6** – record flooding, **7** – the hottest year on record, **8** – rising sea levels.
- ❑ **8** – Model results that predict climate catastrophe. **9** – The Hockey Stick graph that proves Earth temperatures are rapidly rising. **10** – Antarctic Ice Core data proving the link between increasing CO2 and temperature.
- ❑ Let’s link these elements under two general categories – **11** Observations and **12** Model Predictions.



Climate Catastrophism's Wigmore Diagram "Case"

❑ Now let's see how the Climate Alarmist's case works out in terms of a Wigmore Diagram...

❑ Here, what I've attempted to portray is that while the individual evidence from any one line of argument may not be fully conclusive, the overall case becomes stronger based on the multiple lines of evidence.

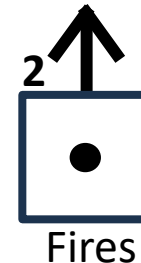


Wigmore Case Against Climate Catastrophism (I)

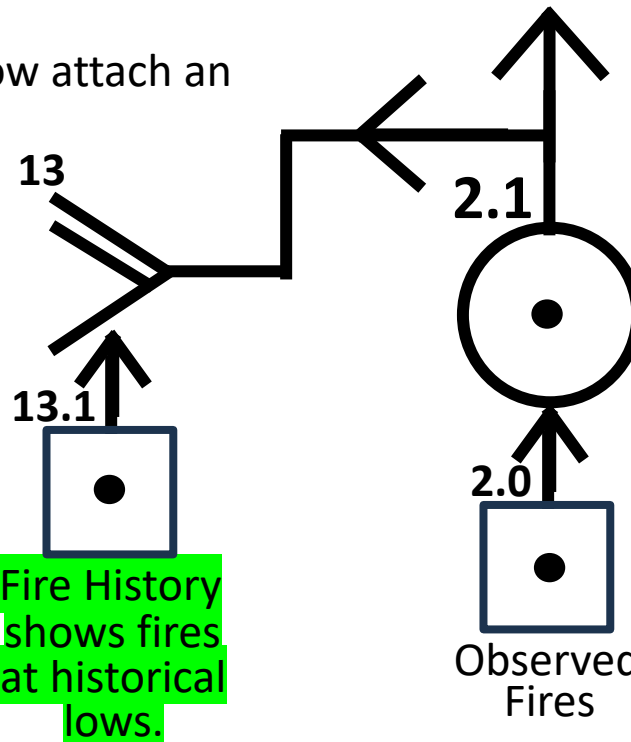
❑ Now let's see how a defense would work AGAINST this supposed "Case" for Climate Catastrophism using Wigmore's Diagrams.

❑ To begin, let's note that the previous diagram was simplified. For example, in the diagram, I expressed the case as...

❑ But in actuality, one has OBSERVATIONS of FIRES, and in addition, the PREMISE that these observations prove that these fires are historic...



❑ However, to this diagram we now attach an exculpatory addendum...



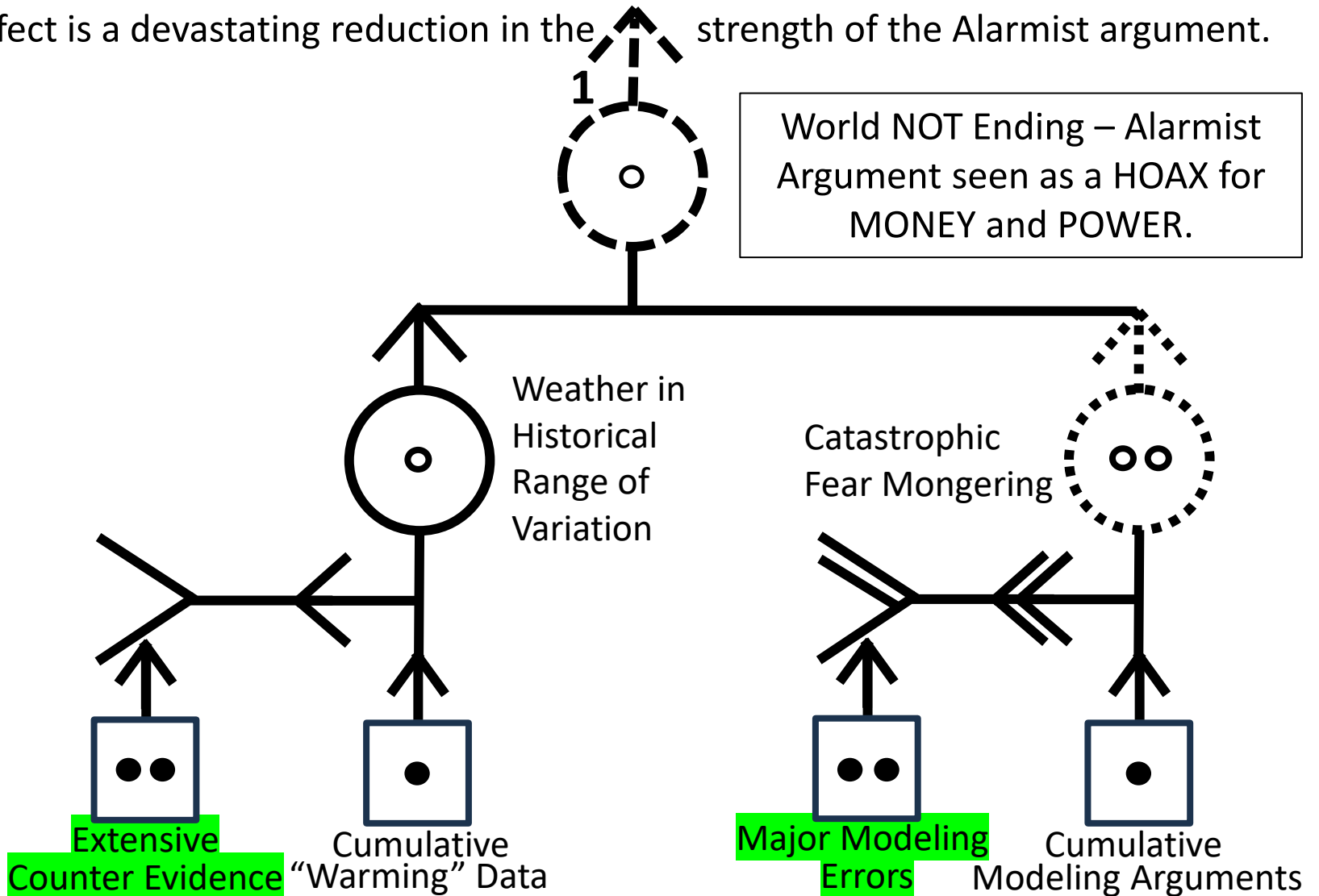
The Observed Fires are Historically Unprecedented.

❑ And similar addenda can be associated with EVERY element of the Alarmist Argument Tree.

Fire History shows fires at historical lows.

Wigmore Case Against Climate Catastrophism (II)

- Given exculpatory evidence related to EVERY element of the Alarmist's "Case" the effect is a devastating reduction in the strength of the Alarmist argument.



Adapting Wigmore's Presentation Method to the Case Against Climate Catastrophism

- ❑ In 2024, the CASF group worked for several months developing what came to be known as – Ed Burlbaw's Ideas – The Insanity of the Global Warming Alarmists.
- ❑ This series of graphics were designed to "SIMPLY" make the case of how Americans have been gulled into believe in the Global Warming Scam.
- ❑ However, these graphics, while valuable, do not lay out the story of alarmism in an easily digestible narrative.
- ❑ Perhaps if expressed in terms of Wigmore's Diagrams the story could be more easily comprehended in its total thrust?
- ❑ As illustrated on the previous 2 slides, the range of these arguments could be fashioned along the lines intended by Burlbaw's and Endlich's charts.

Step 1 – Title Page Adjustment (?)

- Question: Does this title page really explain what our graphics are intended to explain?

The Top Dozen (or so) Graphics
Global Warming Alarmist Ideas

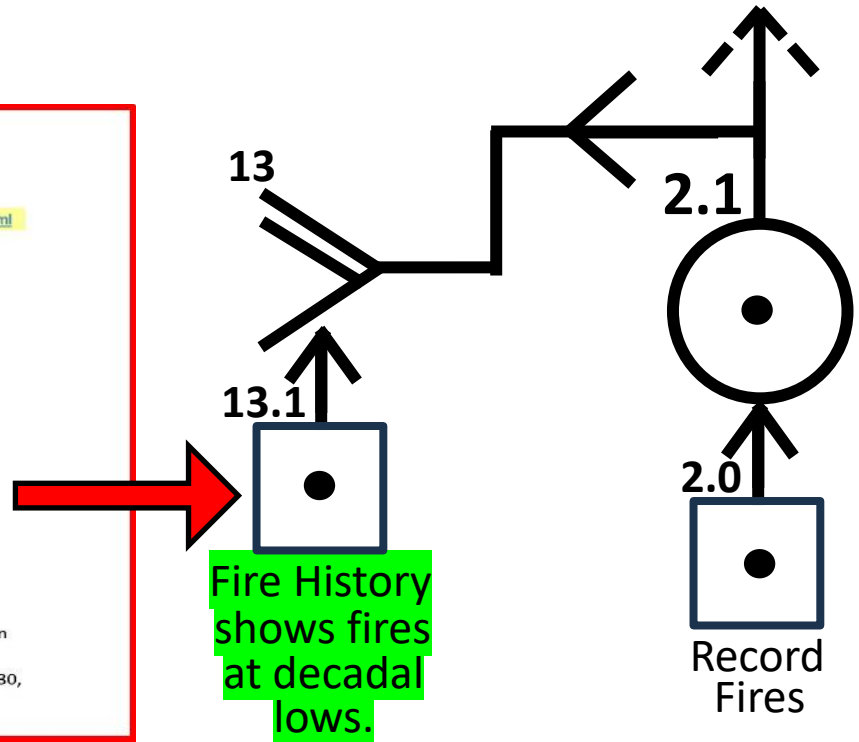
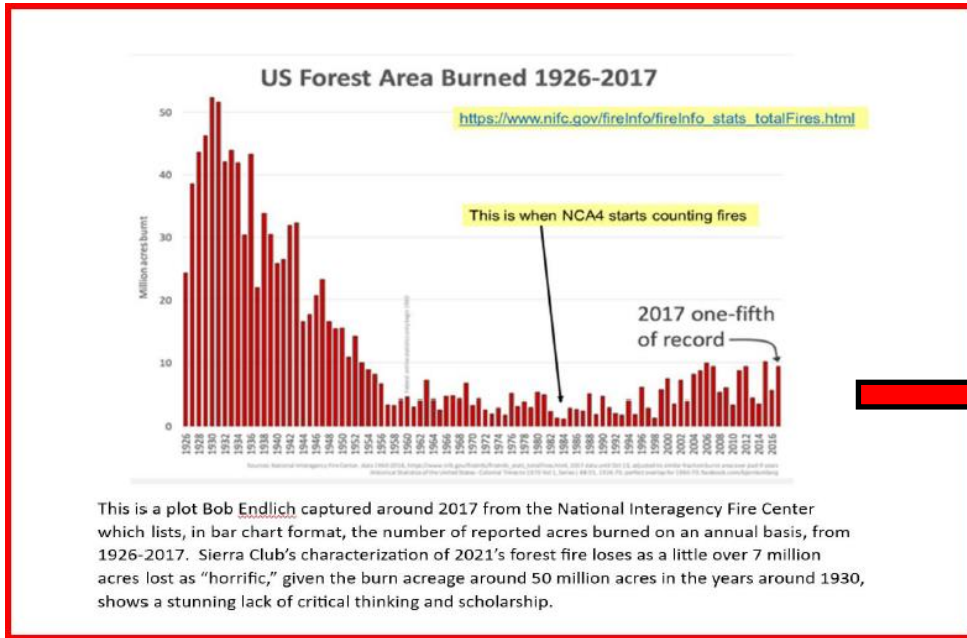
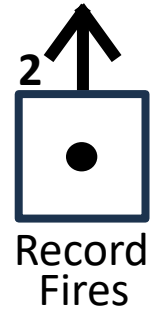
- Perhaps we could amend this to read –

14 Graphical Refutations
of Global Warming Alarmism

- Also, the title of the piece appears to be “Ed Burlbaw’s Ideas – The Insanity of the Global Warming Alarmists.” But unfortunately that title does not appear on the first page. It might be nice to amend the title to reflect Ed’s original purpose.

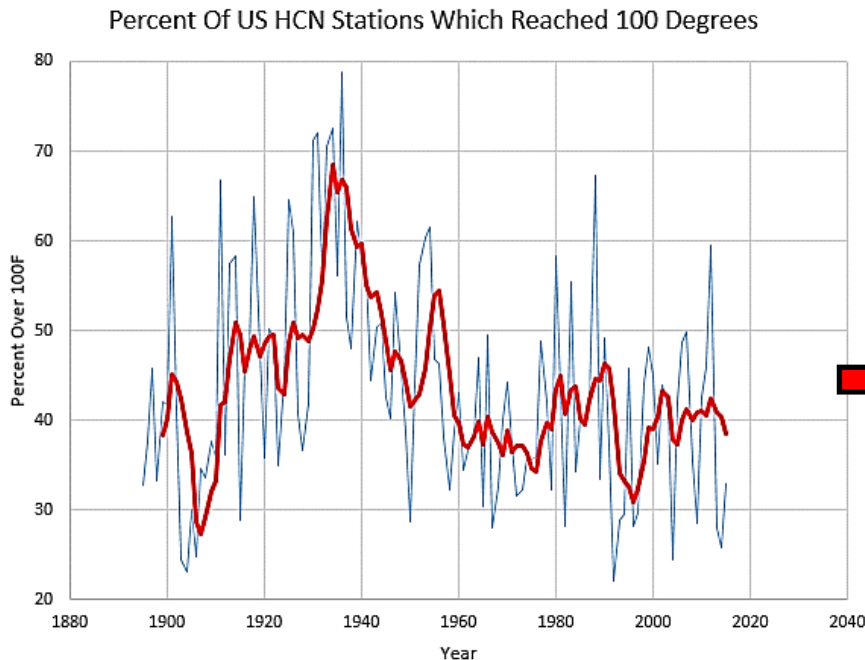
Alarmist CLAIM: Record Fires!!! -- FALSE

☐ Reality: US Fires have dropped to historically low levels!

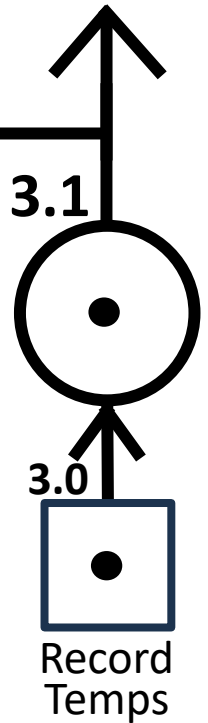
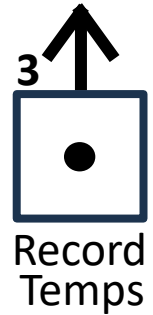


Alarmist CLAIM: Record Temps!!! -- FALSE

Reality: Frequency of temperatures over 100 deg F is steady, not at its maximum.



Period of US stations reporting highest rates of Temps > 100F was 1930s.



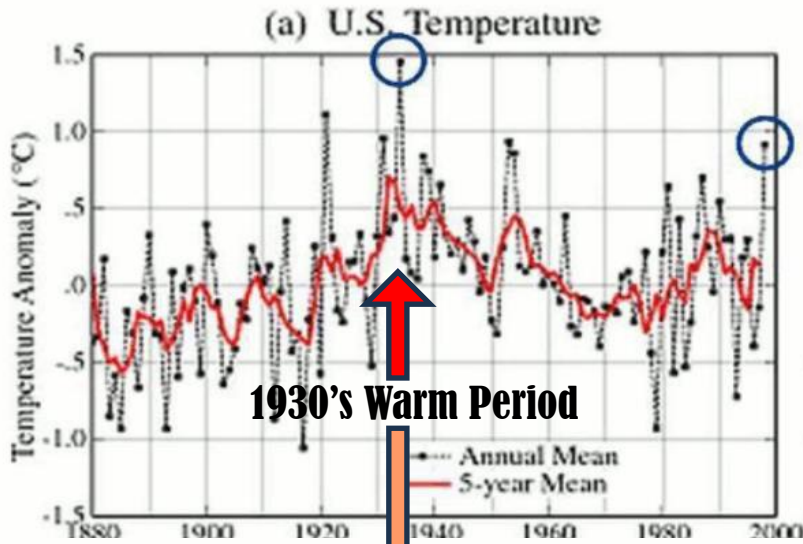
14

14.2

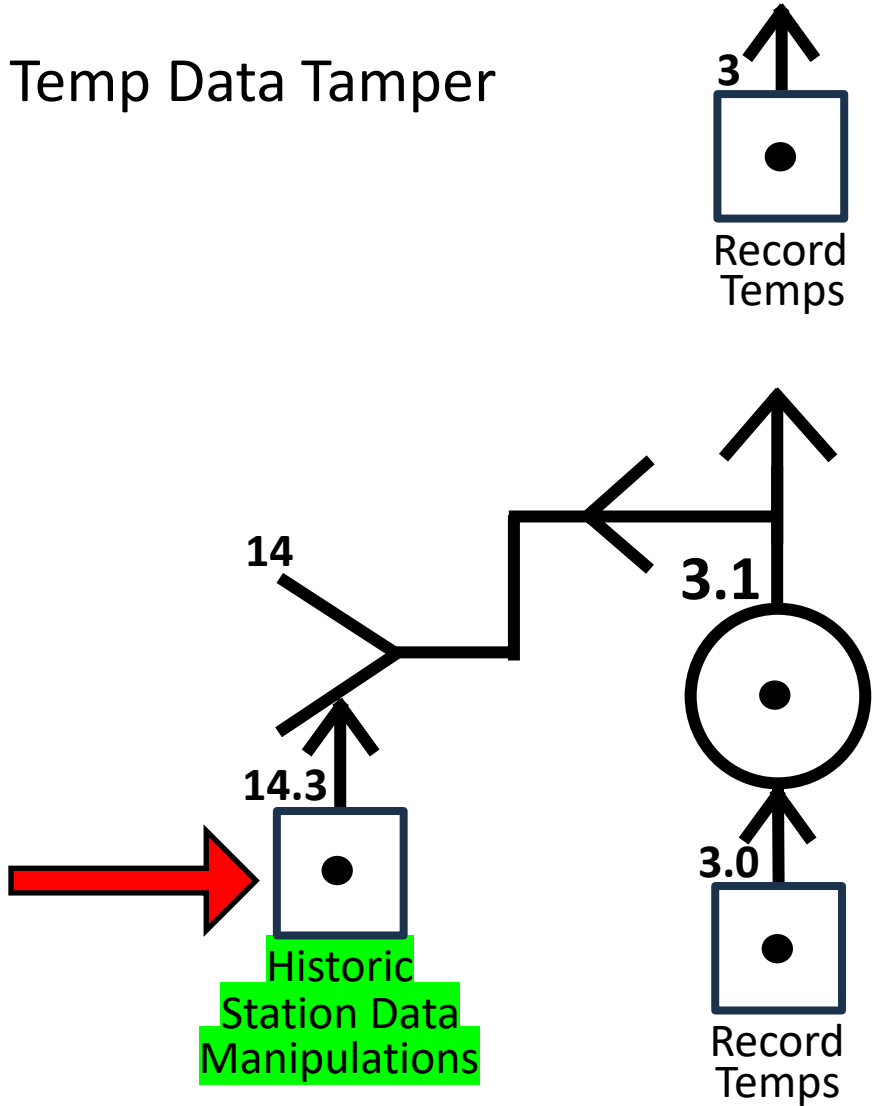
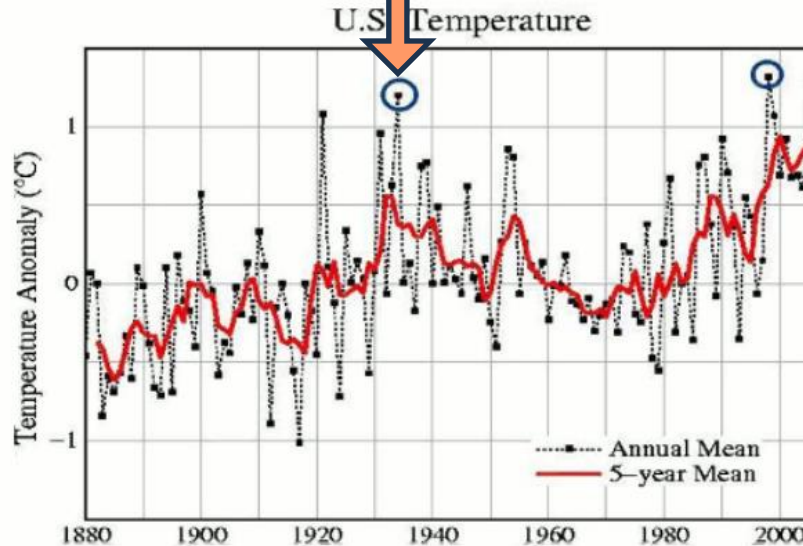
Alarmist CLAIM: Record Temps!!! -- FALSE

☐ Reality: Evidence of Historical Temp Data Tamper

Original Data



Tampered Data



Now Note... Combined Data Makes the Case Against the Alarmist Claim Stronger

Initial Alarmist CLAIM: Record Temps -- FALSE

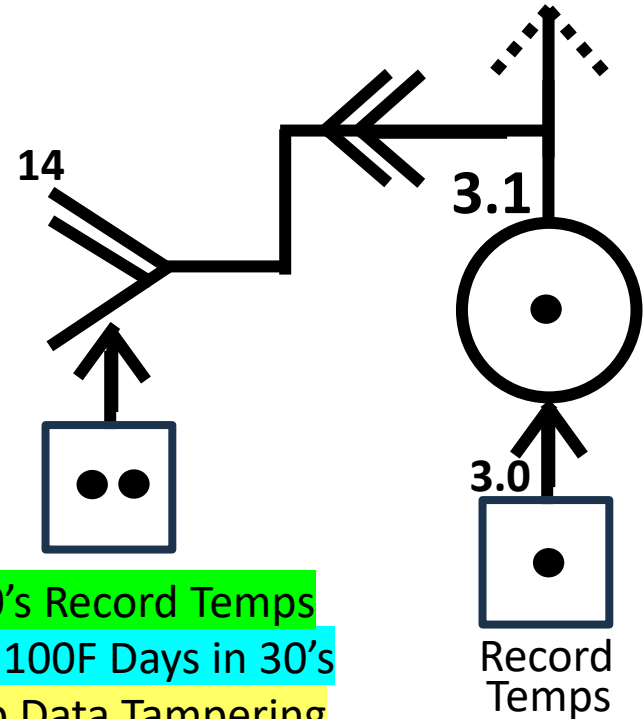
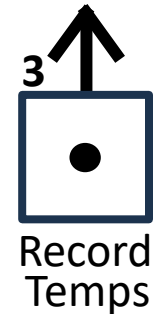
23 1930's State Record
Temperatures

Decline in 100F Days
Since 1930's

Historical Temperature
Record Tampering

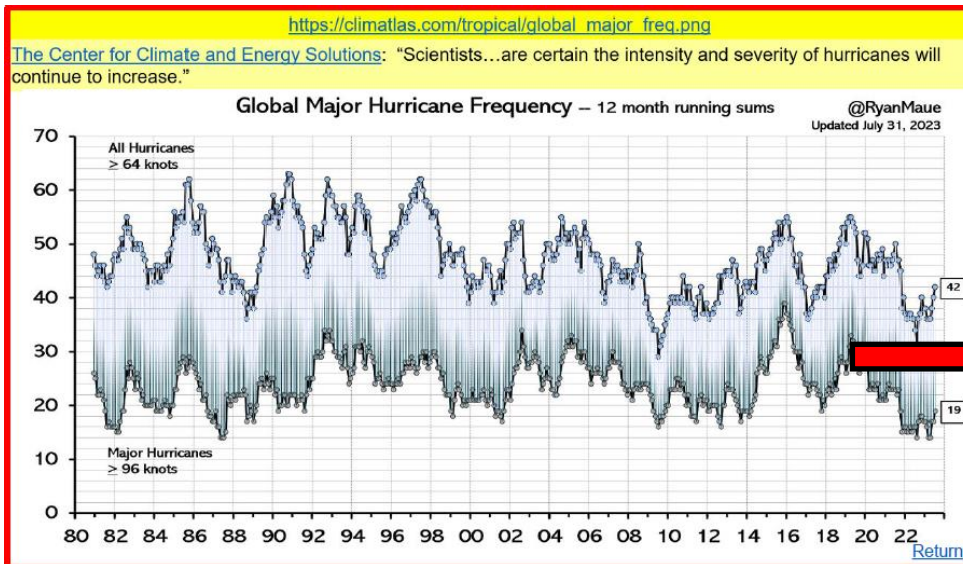
14.1
14.2
14.3

1930's Record Temps
More 100F Days in 30's
Temp Data Tampering

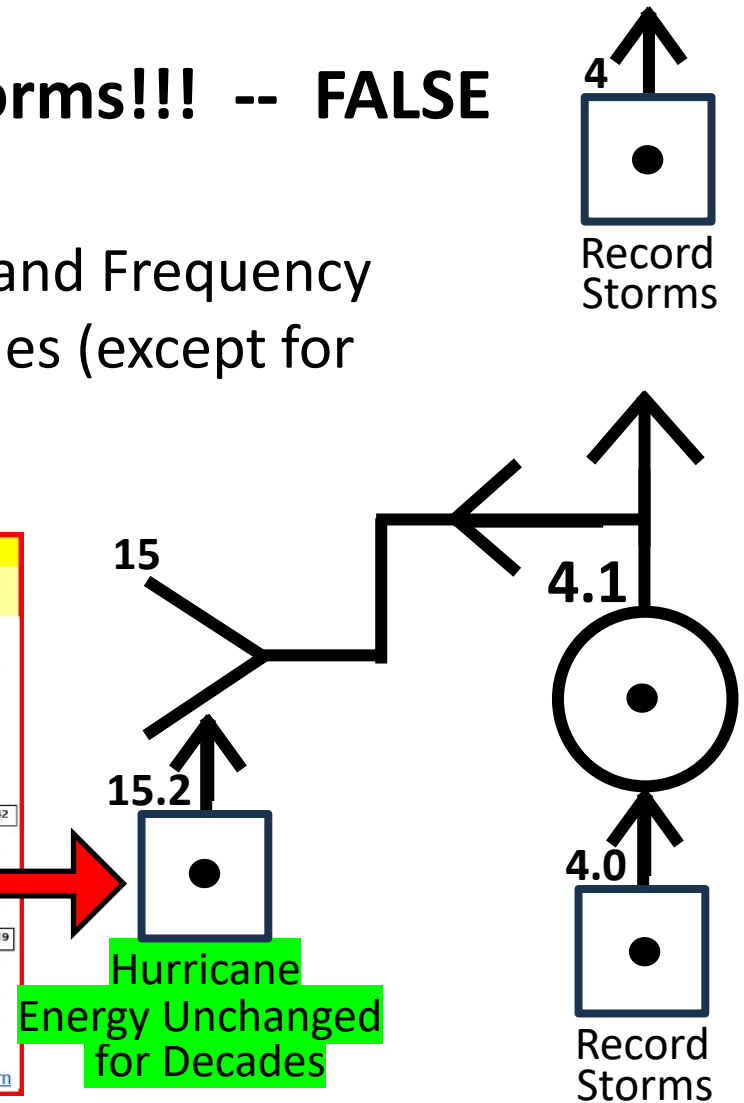


Alarmist CLAIM: Record Storms!!! -- FALSE

- Reality: Global Hurricane Energy and Frequency virtually has not changed for decades (except for natural variations)!

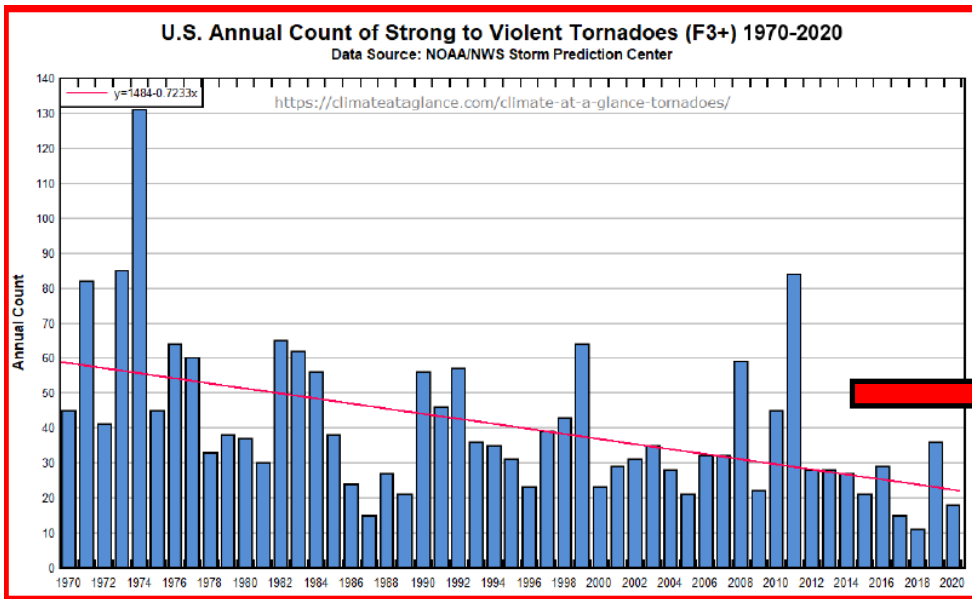


Hurricane Energy Virtually Unchanged for Decades!

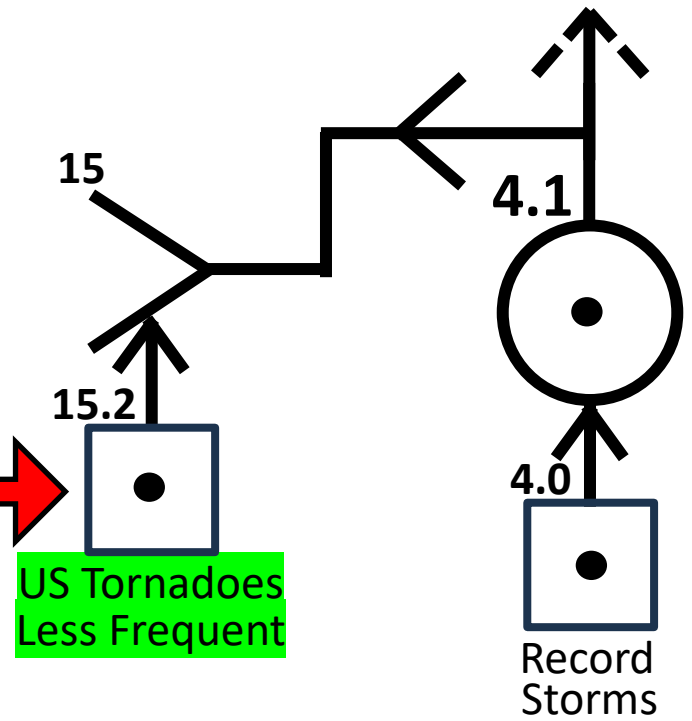
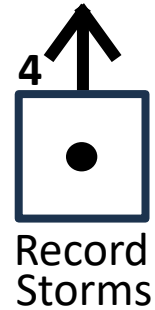


Alarmist CLAIM: Record Storms!!! -- FALSE

- Reality: The number of Violent US Tornadoes is Dropping in Frequency, NOT Rising!

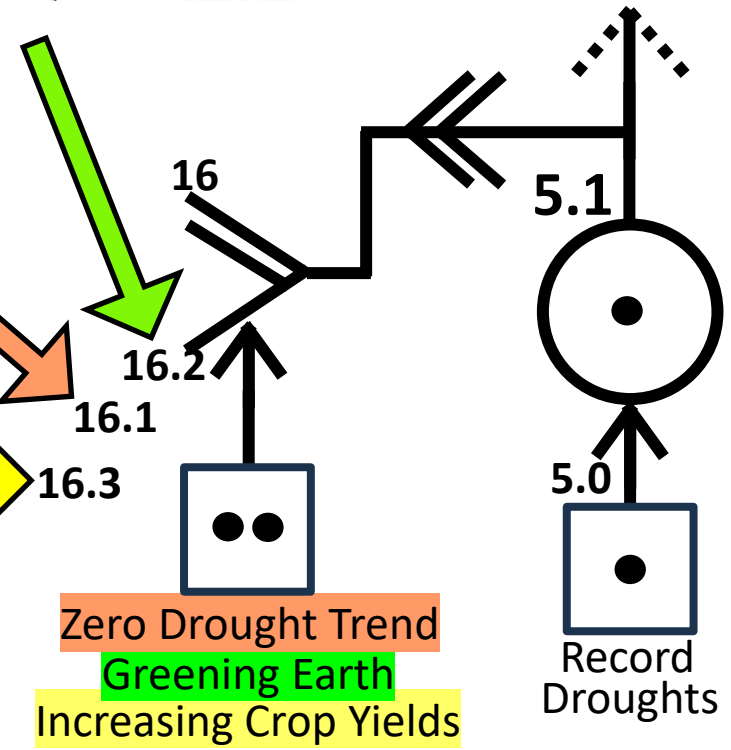
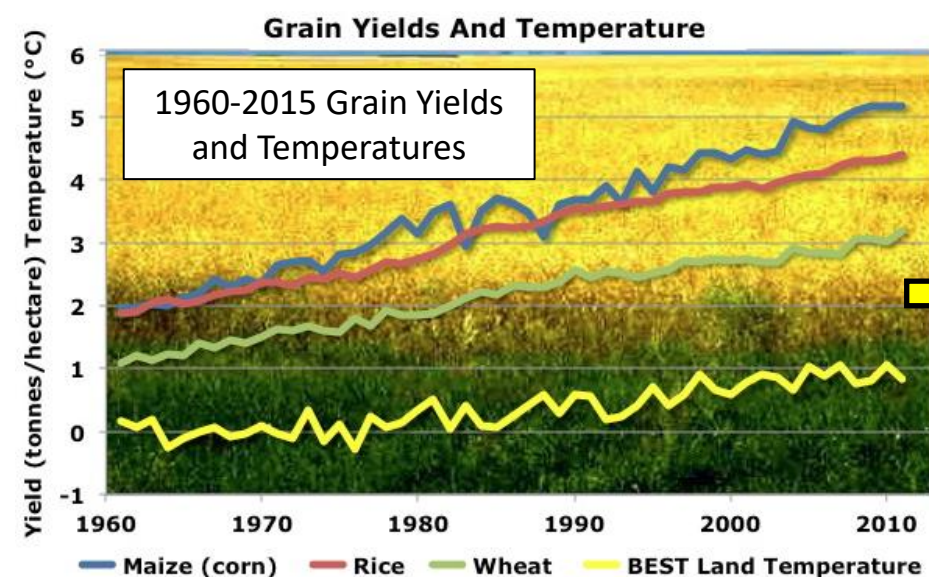
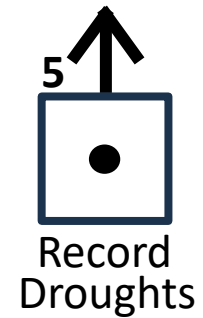
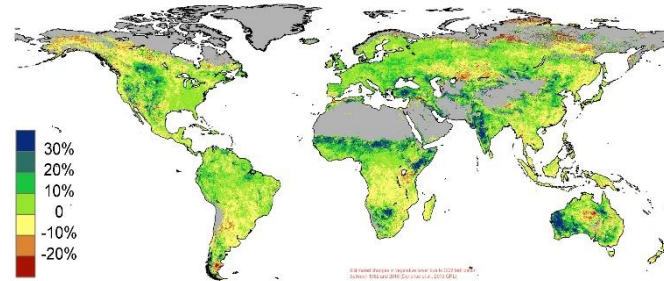
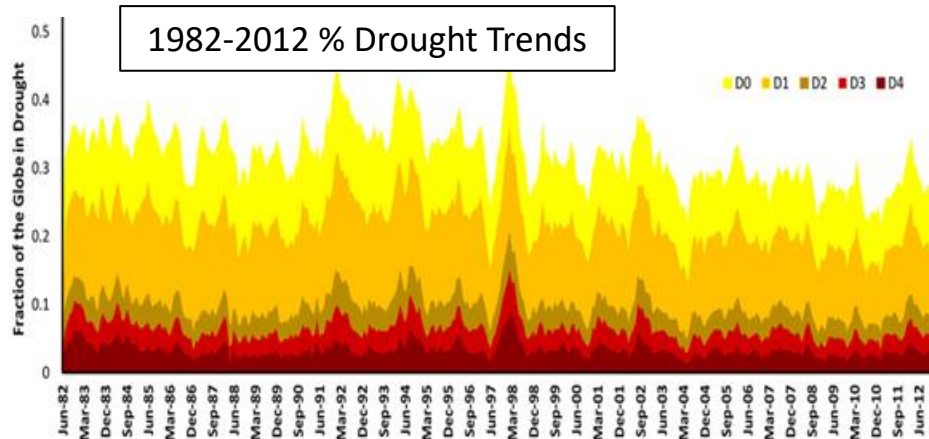


US Violent Tornadoes occurring at decadal lows



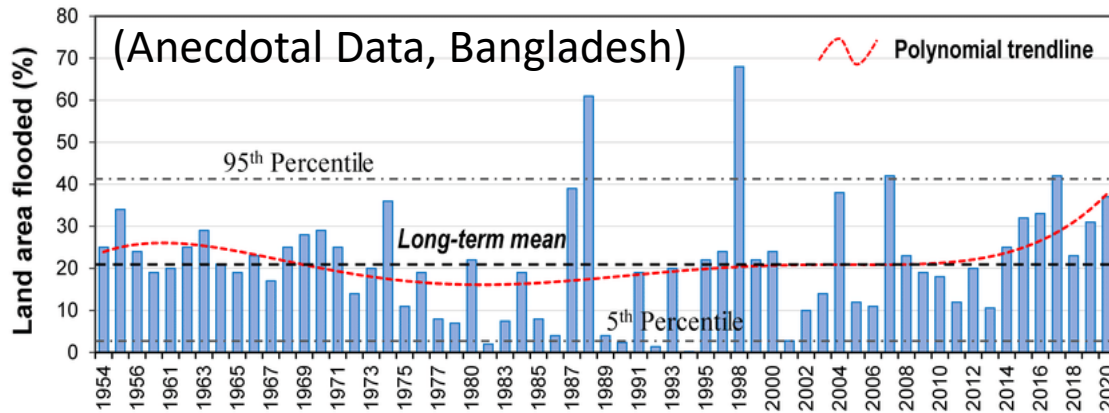
Alarmist CLAIM: Record Droughts!!! -- FALSE

- Reality: Drought levels show Zero Trend; Earth Greening due to increased CO2; Crop Yields Increasing with CO2.

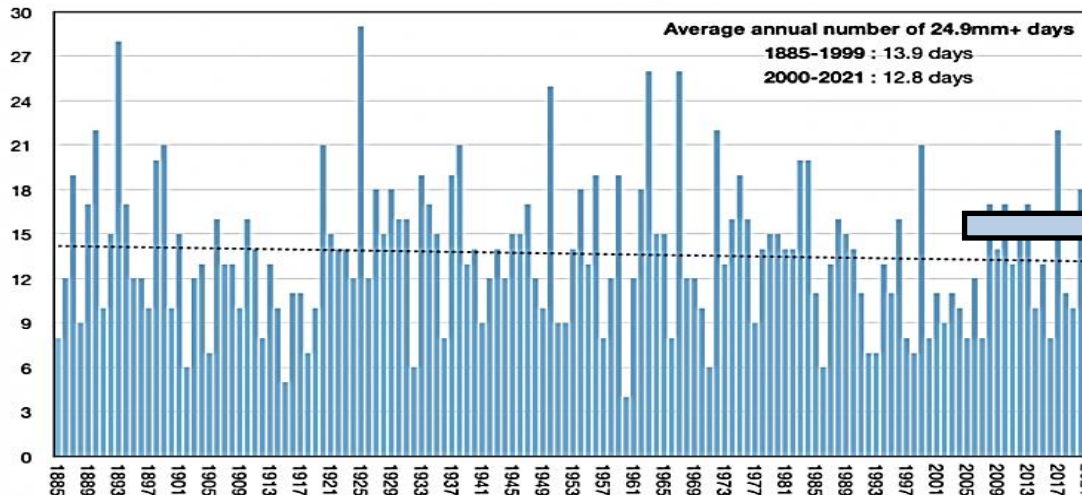


Alarmist CLAIM: Record Floods!!! -- FALSE

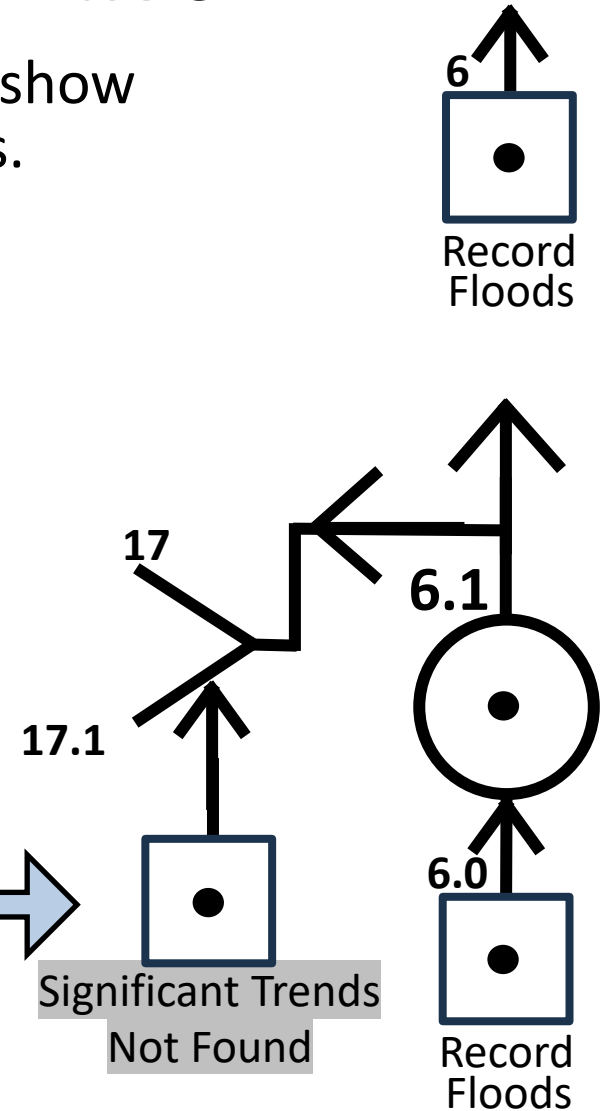
- Reality: Flood rates at different locations show Variable Behaviors, but no Definite Trends.



Annual # days above 90th percentile (24.9mm) rainfall at Lismore 58037 and 58214, 1885-2021

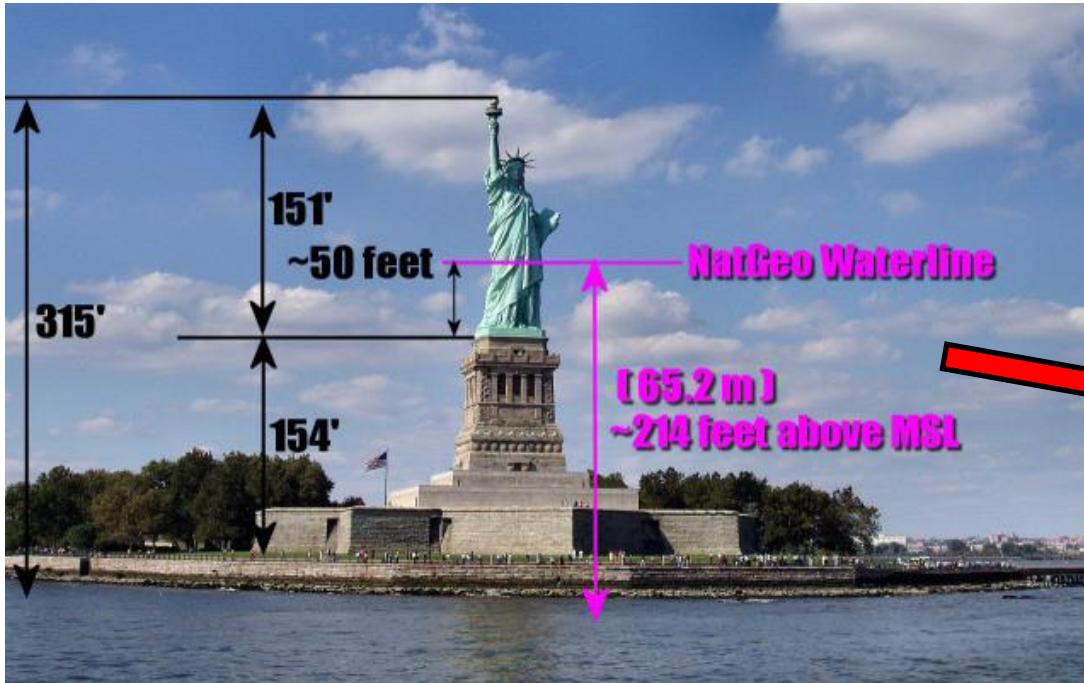


(Anecdotal Data, Australia, climatechangethefacts.org.au)

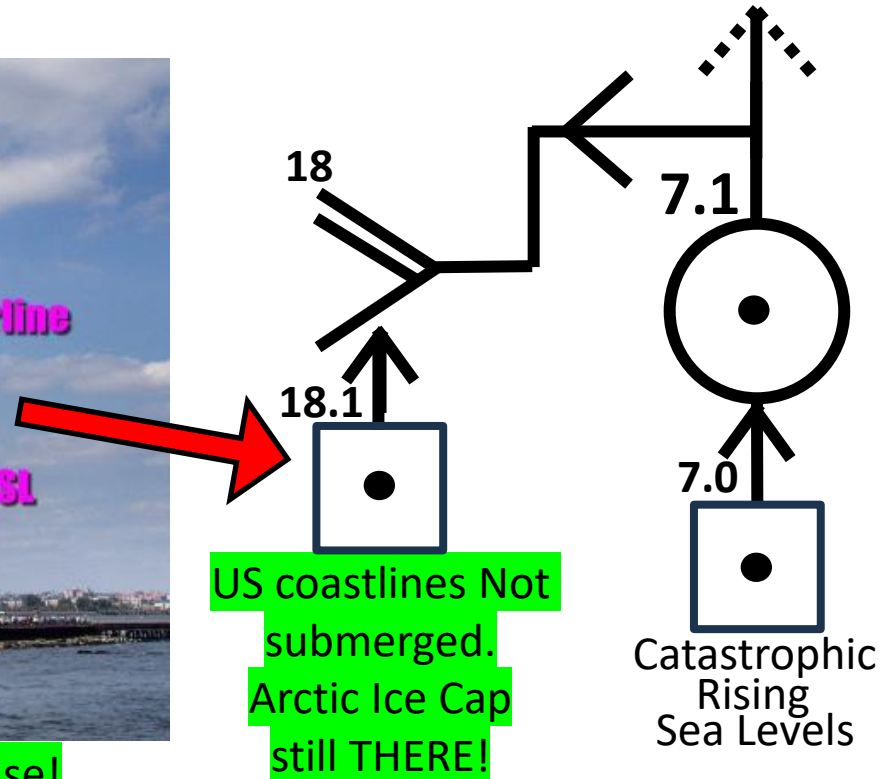


Alarmist CLAIM: Rising Sea Levels!!! -- FALSE New York River Drive Under Water by 1989!!!

- Reality: Space-based heights unreliable.
Summer Arctic Sea Ice not “gone by 2013.”
River Walk NOT Under Water

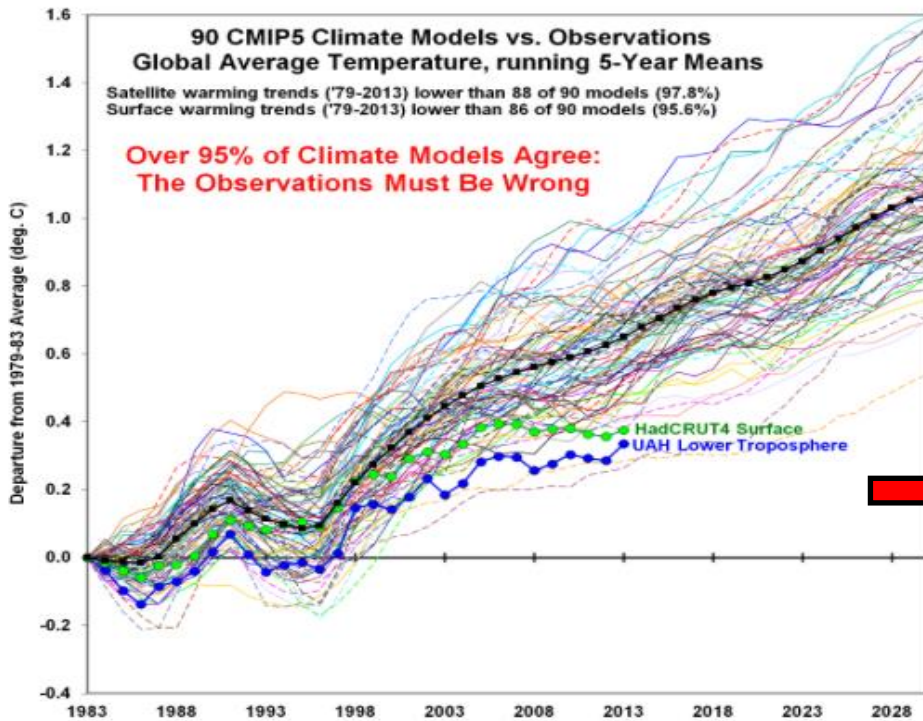


Catastrophic Sea Level Rise Predictions False!

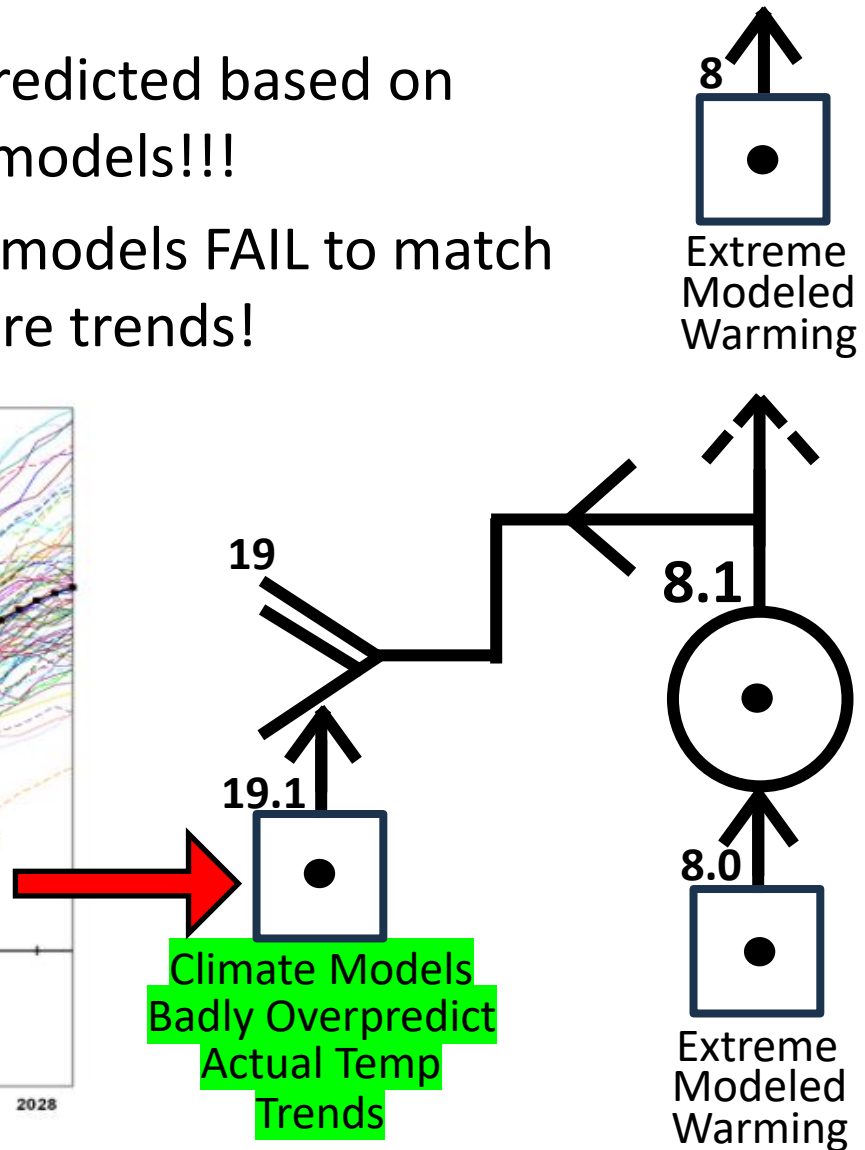


Extreme Warming Predictions!! -- FALSE

- ❑ Claim: Extreme warming is predicted based on hundreds of standard climate models!!!
- ❑ Reality: Hundreds of climate models FAIL to match observed planetary temperature trends!



95% of Model Predictions Exceed Measurements!



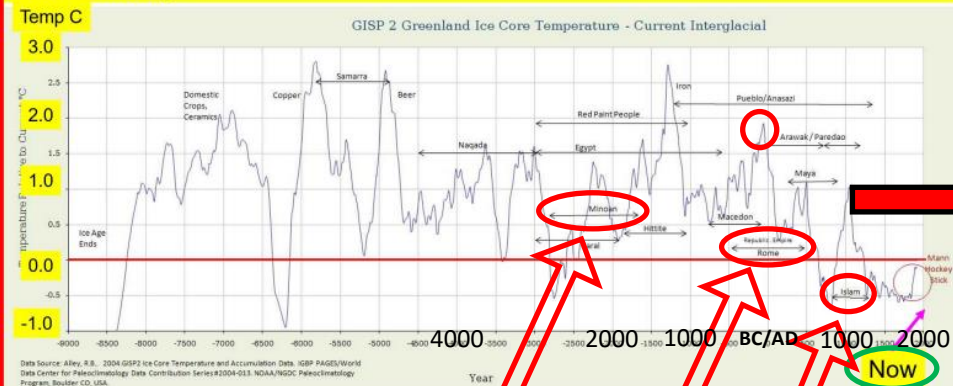
Alarmist Mann's Hockey Stick!! -- FALSE

- ❑ Claim: Michael Mann's "Hockey Stick" Temperature Reconstruction Graph PROVES Earth Temperatures are at record highs!!!
- ❑ Reality: Mann's Graph based on flawed tree-ring data misses numerous ancient warm periods!

Data from Alley's GISP2 Greenland Ice-Core

<https://wattsupwiththat.files.wordpress.com/2011/07/alley-2004.jpg>

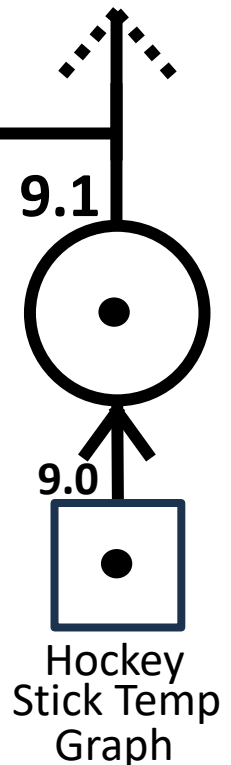
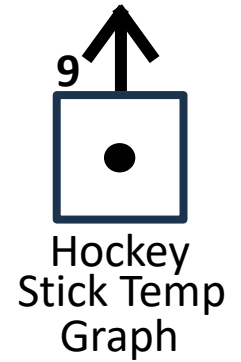
Times in the recent past, temperature trace above the red line, show times in the past that were hotter than today.



If you understand this chart, you will see the ignorance of the climate Alarmists' cries of "Existential Threat"

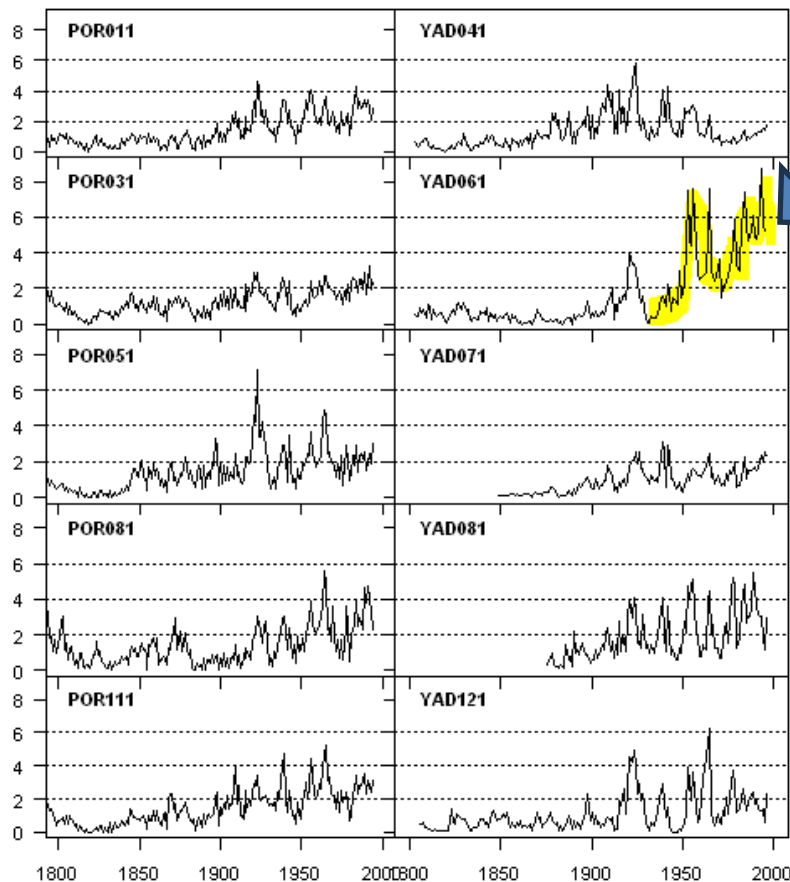
Mann Graph misses Minoan, Roman, Medieval and Earlier Warm Periods

Bad Tree Ring Analysis Produced Invalid Temp Graph



How Tree-Ring Data Got Falsified... To Produce Michael Mann's Phony Hockey Stick Warmist Temperature Graph

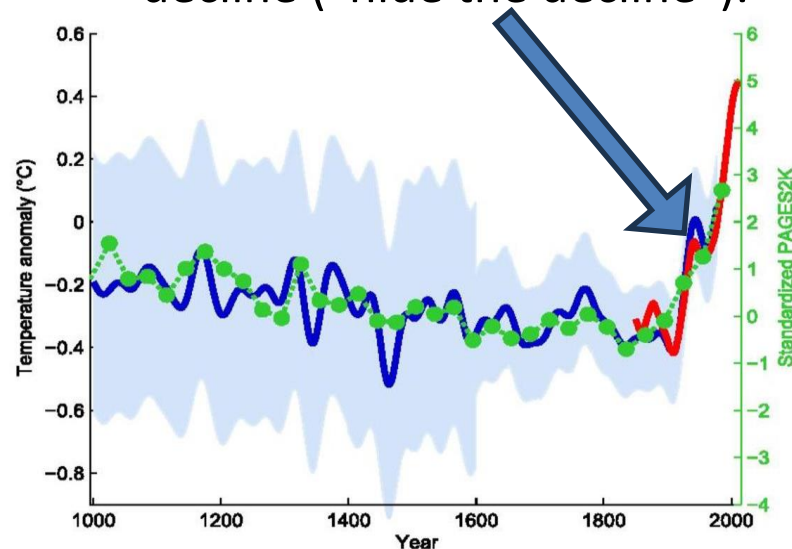
1. Begin with a set of Tree-Ring samples.



Data from Briffa's 12-Tree Warming Set

2. Cherry pick one Tree-Ring data set and weight it 100 X every other sample set...

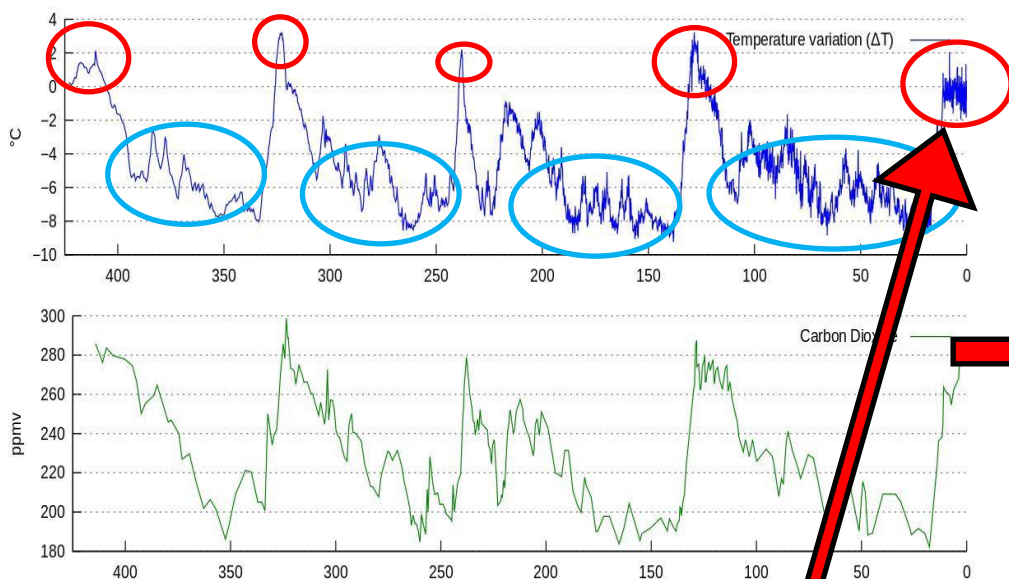
3. Blend in several data sets and hide the fact that one data set is cut off because it begins to decline ("hide the decline").



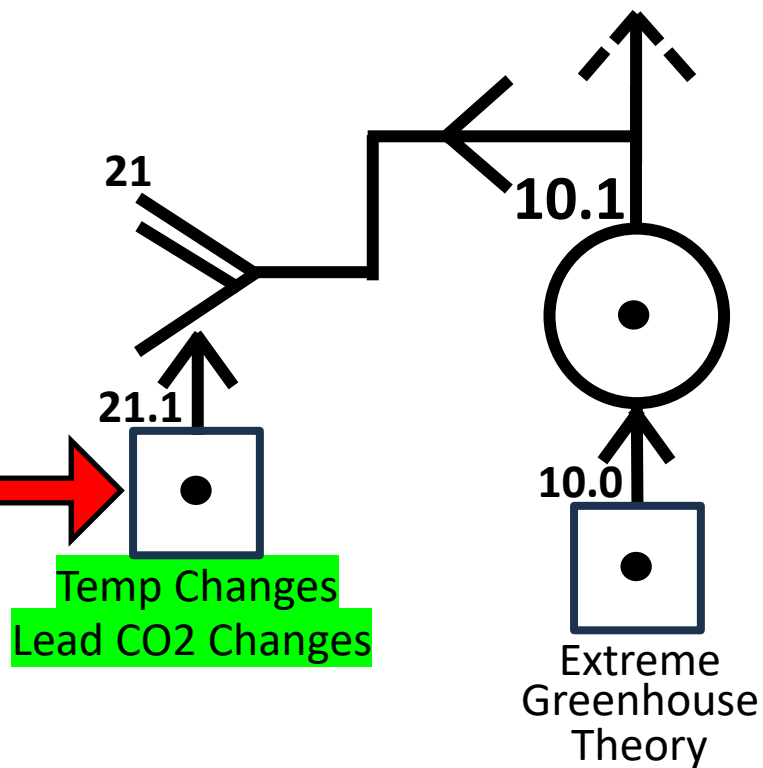
4. Proclaim a Warming Crisis!

Claim: Increased CO₂ Causes Temp Increases!! -- FALSE

- ❑ Claim: CO₂ creates extreme Greenhouse Effect (up to 8.5 deg C per doubling!). Proven based on Antarctic Ice Core Data Sets.
- ❑ Reality: Ice Core Data shows Temperatures lead CO₂. Henry's Law: Ocean Temp increases drive more CO₂ into Atmosphere.

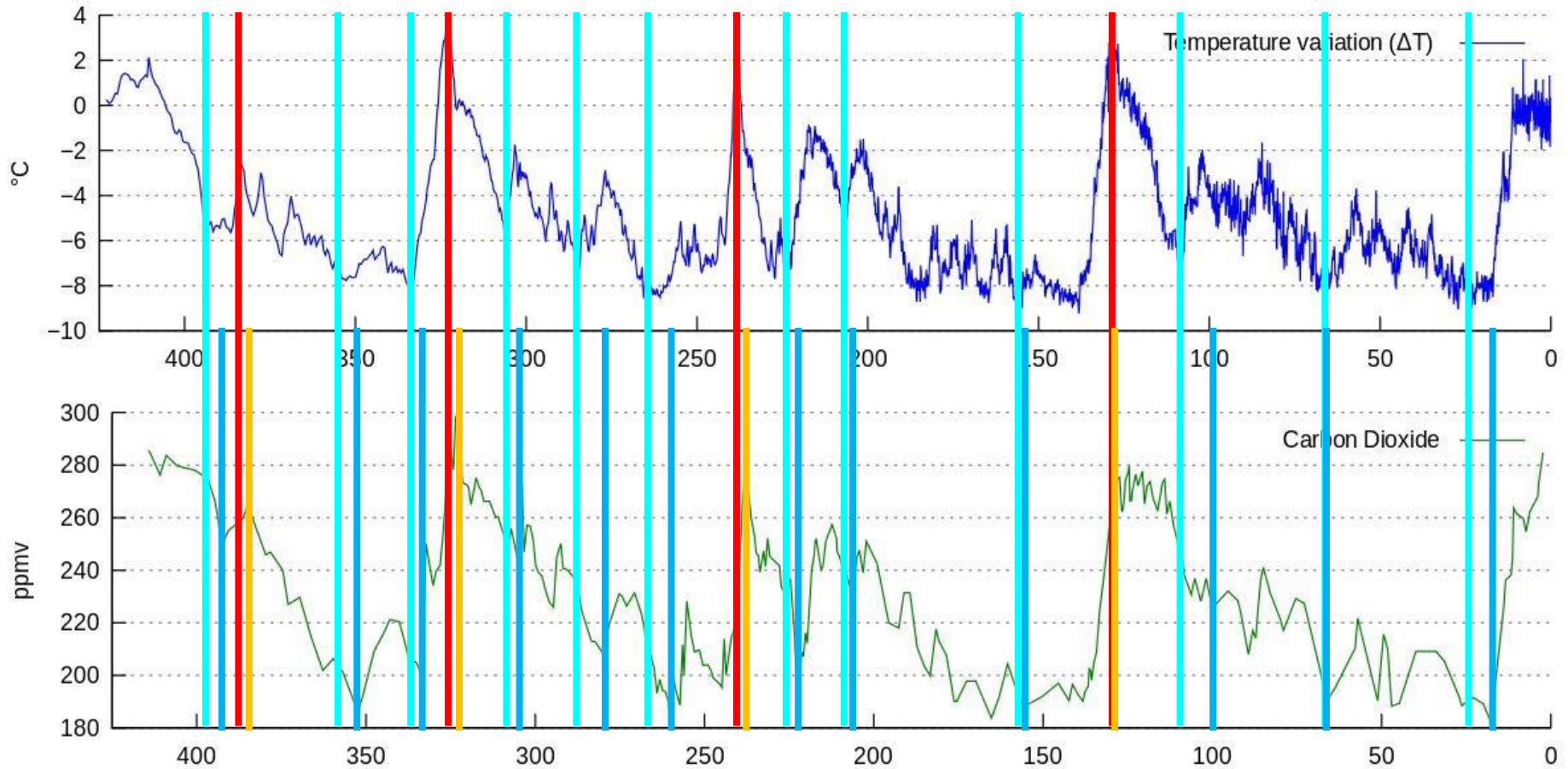


Current Warm Period



“Al Gore’s” Vostok Ice Core Data

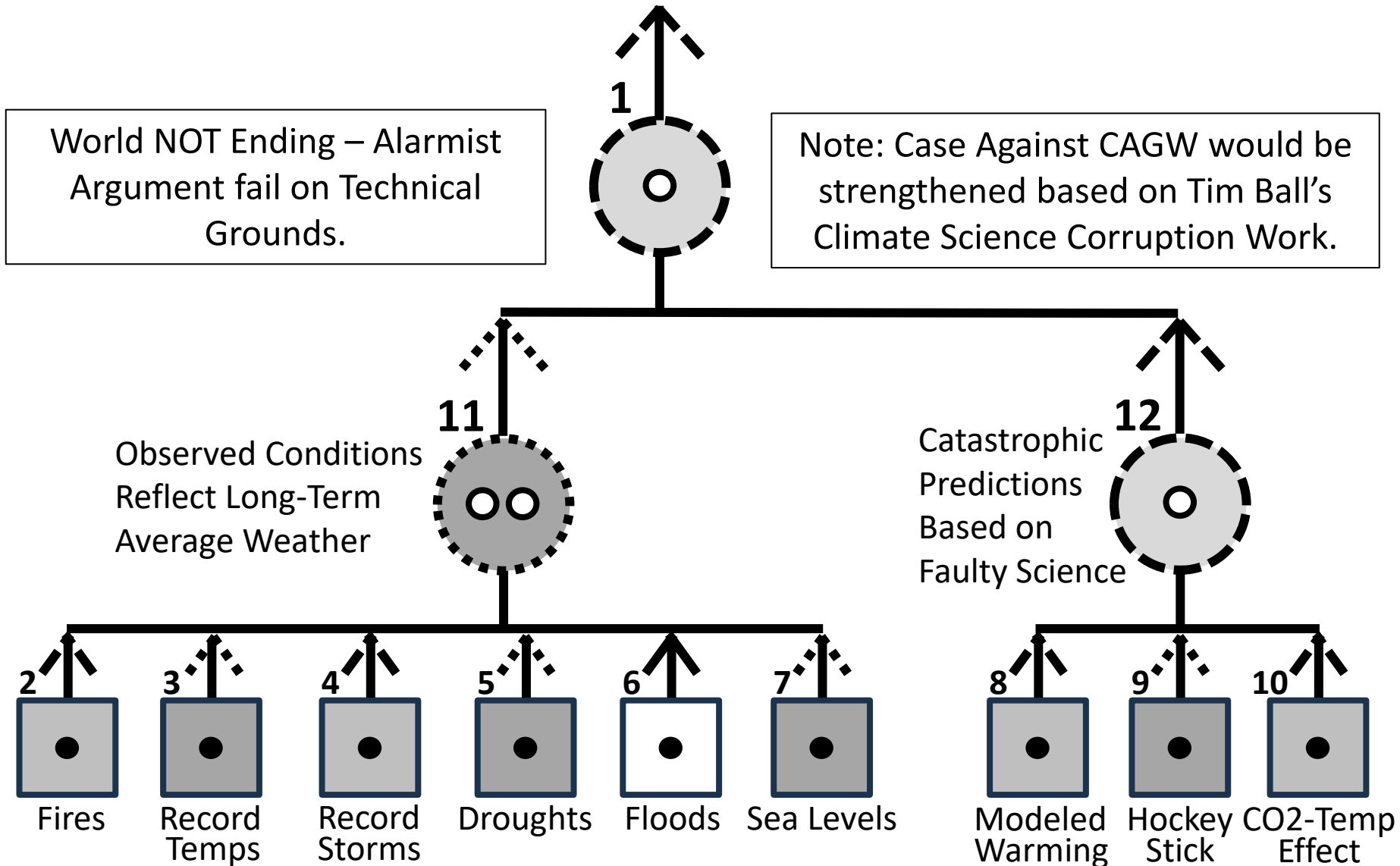
(Reveals Temperature Changes Lead CO₂ Changes)



Data Source: <https://keski.condesan-ecoandes.org/vostok-ice-core-chart/>

Climate Catastrophism's Tainted "Case" Fails

❑ Now let's see how the Climate Alarmist's case has stood up against REAL DATA.



CONCLUSION:

Using Wigmore Critical Thinking Diagrams to Defeat Climate Skepticism

- ❑ While the Wigmore Diagramming Technique takes some time to get used to, it provides a visual means of examining a logical argument.
- ❑ In essence, it shows the elements of the argument and helps identify the main line of discussion in making the essential points that defend or demolish a given position on an issue or debate.
- ❑ In the specific case of the climate debate this method points out that there are really only two major lines of argument used by the extremists in arguing for the Climate Alarmist position: That weather events point to a climate apocalypse, and that their models and predictions point to drastically worsening conditions. Yet, as we know, the data are faulty, and the predictions are falsified by current data versus old predictions that do not match the current trends.