**Essay 2 – Lecture notes**

* Required Readings:
  + The “Hockey Stick” Graph (74-75)
  + “Myth vs. Fact Regarding the ‘Hockey Stick’” Michael Mann – (76-81)
  + “Battle over Climate Data Turned into War Between Scientists and Skeptics” – Fred Pearce – (83 – 89)
  + “Climate Change Debate Overheated and Sceptic Grasped ‘Hockey Stick’” – Fred Pearce – ( 91 – 96)
* Background for Global Warming
  + 1960 – 70s: researchers were noticing increased global temperatures
    - Is it *weather* (short term)or is it *climate* (long term trends) ?
    - SCIENCE RESEARCH QUESTION: *Is global warming happening?*
  + 1980 – 1990: researchers established that global warming WAS a reality
    - The controversy was NOT about whether it was happening
    - Discussion shift to knew question
    - SCIENCE RESEARCH QUESTION: *What is causing global warming?* 
      * Two possibilities:
        + 1. It’s a natural phenomenon
        + 2. It’s anthropogenic (human caused)
  + 1990 – 2000s
    - Mann’s research 🡪 “Hockey Stick” Graph”
    - CONFIRMED: Global warming is caused by human activity
    - SCIENCE RESEARCH QUESTION: *What do we do about global warming?* 
      * Two options
        + 1. Take action

Consequences (intended and unintended)

* + - * + 2. Take no action

Consequences (intended and unintended)

**Part A: Decision Matrix**

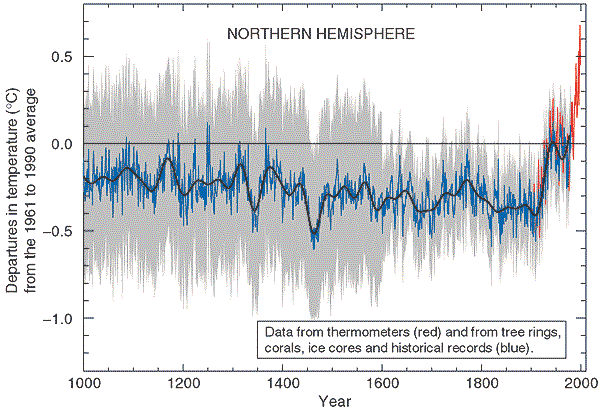
* To break down the various possible outcomes of a given action
* Helps with deciding on the best course of action to take given binary (two) scenarios

**Part B: Summary of articles**

* Summarizing the findings and criticisms of Mann’s research
  + Locate where different lines of evidence **CONVERGE**
* Locating additional sources to bring discussion current

***Part C: Analysis of argument***

* *Evaluating the findings and criticisms of Mann’s research*
* *Determining the best course of action*



*How do we read this chart?*

* *It is a record of temperatures*
  + *Temps that strayed away average mean temps (the 0.0 point)* 
    - *Over 1000 years*
      * *In the Northern Hemisphere*
* *What means does the researcher use to track these changes in temp over time?* 
  + *Thermometer readings*
  + *“Proxy” data (data that can stand in for thermometers)*

**Why use “proxies”?**

* Modern scientific thermometers are an 18th century invention.
* Accurate measurements based on accepted standards only since late 1800s
* Individual proxies are problematic but multiple CONVERGING proxies are powerful pieces of evidence
  + 1. *Tree rings*
    2. *Corals*
    3. *Ice Cores*
    4. *Historical records*

**Using the assigned readings**

The essay project is calling for you to perform summary tasks and analysis tasks:

**Summary tasks (Part B) 🡪 focused on the text and what the authors are saying**

* + Summary of Mann’s research process
  + Summary of findings from Mann’s research
  + Summary of major critiques of Mann’s research

**Analysis tasks (Part C) 🡪 more argumentative, focused on the essayist’s (YOUR) voice, opinion, interpretation of the material.**

* + Assessing the quality of Mann’s research and his findings (are they persuasive?)
  + Assessing the quality of the critiques (are they persuasive?)
  + Breakdown of decision matrix towards a thesis statement

1. “Hockey Stick” Graph: research process and the findings; assessing quality of the research/findings
2. “Myth vs Fact” (Mann’s article): summary of critiques (“Myth” = critique); assessing the critics
3. Pearce Articles: general overview of the controversy; summary of findings, critiques, and research; assessing findings and the critiques
   1. Ethos: who can we trust?
      1. What is the expertise of Mann vs his critics.
      2. Email scandal may impact Mann’s ethos
      3. Mann’s personality man impact ethos
      4. Are M&M guilty by association (re: who they work for); what is their agenda?
   2. Logos: the quality of the research
   3. Pathos: emotional connection the public has to this topic
      1. They may be called on to make changes to their lifestyles
      2. They may be called on to react to problems stemming from AGCC

**NEW READING (for *NEXT* essay):**

**“Behavioral Study of Obedience” (Milgram)**

**Pg 115-127**

* **This will be the first reading for our researched paper**
* **There will be a blog response posted this week. It will not be due until after Essay 2 is turned in**

**ANALYSIS : BP #5 - Courses of Action (what steps should we take) with AGCC**

* + 1. **Locate and highlight the ARGUMENT(S) made in the article (what sounds like what we’d call a “thesis statement”)** 
       - **Look for *declarative words and phrases: “should” “must” “need to” “have to”***
       - **You can usually find these statements in the first several lines of a news article**
       - **Sometimes these statements are subtle, buried, or only implied. This is usually the case with lengthy magazine type articles**
    2. **Locate & highlight the AUTHORTIES discussed in the article (HINT: They may be people, institutions, or publications)**
       - **Which authority you signal depends on what the source is**
       - **News article/reporting article: the author may not be important, but the people they quote will be**
       - **Often an institute is more important than the individual researcher (although not always, esp. when an researcher becomes well known)**

Google Pearce and Kolbert to check credentials = “vetting”

* + - * + **Fred Pearce : his “authority” comes from the publications he writes for**
        + **Kolbert : her background and the people she interviews**
    1. **Locate & highlight DATA discussed in the article** 
       - **In general, you want to carefully paraphrase and summarize numerically-based data which will allow you translate the information for *your* reader.**

**Policy makers should not discount the damages from future climate tipping points (ONE IDEA FOR ADDRESSING AGCC)**

***Date:***

March 23, 2015

***Source:***

University of Exeter

***Summary:***

Society should set a high carbon tax now to try and prevent climate change reaching a point of no return according to a new study. The study shows that the prospect of an uncertain future tipping point should greatly increase the amount we are willing to pay now to limit climate change.

The research, carried out by **the Universities of Exeter, Zurich, Stanford and Chicago** **[FOUR TOTAL UNIVERSITIES}** is published in the journal *Nature Climate Change* and shows that the prospect of an uncertain future tipping point should greatly increase the amount we are willing to pay now to limit climate change. SIGNAL THE PUBCLICATION: “In a recent article publised in the journal *Nature Climate Change* it was reported that four major universities collaborated on research which concluded that “society should set a high carbon tax now to try and prevent climate change reaching a point of no return.” (University of Exeter) 🡪 *interpretation.*

Depending on the economic impacts of an abrupt change in climate **[rising sea levels = more infrastructure spending**] and how quickly this is felt, the cost of carbon emitted now increases by 50 -- 200%. [factories, burning fossil fuel] Setting a correspondingly high carbon tax would **trigger** a reduction in carbon emissions that delays the tipping point.[**Negative incentive]** aka regulation

The researchers developed a model to investigate how the uncertainty surrounding tipping points should influence climate policy. Based on expert input, the likelihood that human activities will push the climate system past a tipping point increases from 2.5% in 2050 to nearly 50% in 2200 in their baseline scenario.

Professor Tim Lenton from Geography at the University of Exeter said: "Our results support recent suggestions that the costs of carbon emissions used to inform policy are being underestimated.

"We are calling on policy makers to respond to the prospect of triggering future climate tipping points by applying the brakes now and putting a high price on carbon emissions before it is too late.

"The additional carbon tax that our model recommends can be thought of as an insurance premium levied on society to delay irreversible damages in the future."

Most methods that weigh up the costs and benefits of tackling climate change ignore climate tipping points and especially the uncertainty surrounding them. Instead they assume that future damages from climate change are known perfectly and can therefore be discounted at a rate comparable to the market interest rate -- reducing the willingness to pay now to protect future generations.

In the new model, the prospect of an uncertain tipping point gave a very different result -- that we should be more willing to pay now to reduce the likelihood of a future tipping point and should discount its damages at a very low rate -- even if they are most likely to occur far in the future.

This is the first quantitative model to demonstrate that low discounting of climate damages can emerge from a pure market-based approach -- it does not have to be based on moral judgements about sustainability and the wellbeing of future generations -- although these are of course important considerations.

The potential climate tipping points considered in the study were a collapse of the Atlantic meridional overturning circulation; irreversible melt of the Greenland Ice Sheet; collapse of the West Antarctic Ice Sheet; dieback of the Amazon rainforest; or an increase in the amplitude of the El Niño Southern Oscillation.

'Stochastic integrated assessment of climate tipping points indicates the need for strict climate policy' by Thomas S. Lontzek, Yongyang Cai, Kenneth L. Judd and Timothy M. Lenton is published in the journal *Nature Climate Change*.

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**Journal Reference**:

1. Thomas S. Lontzek, Yongyang Cai, Kenneth L. Judd, Timothy M. Lenton.**Stochastic integrated assessment of climate tipping points indicates the need for strict climate policy**. *Nature Climate Change*, 2015; DOI:[10.1038/nclimate2570](http://dx.doi.org/10.1038/nclimate2570)