

Strange Falsifications in the Wegman Report

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1 Introduction

In the literature of serious academic misconduct, **FFP** stands for the trio:

Falsification – changing information or misrepresenting sources

Fabrication – inventing information or sources

Plagiarism – copying ideas or near-verbatim text without giving credit

Google: ffp falsification - the reader can choose among many hits.

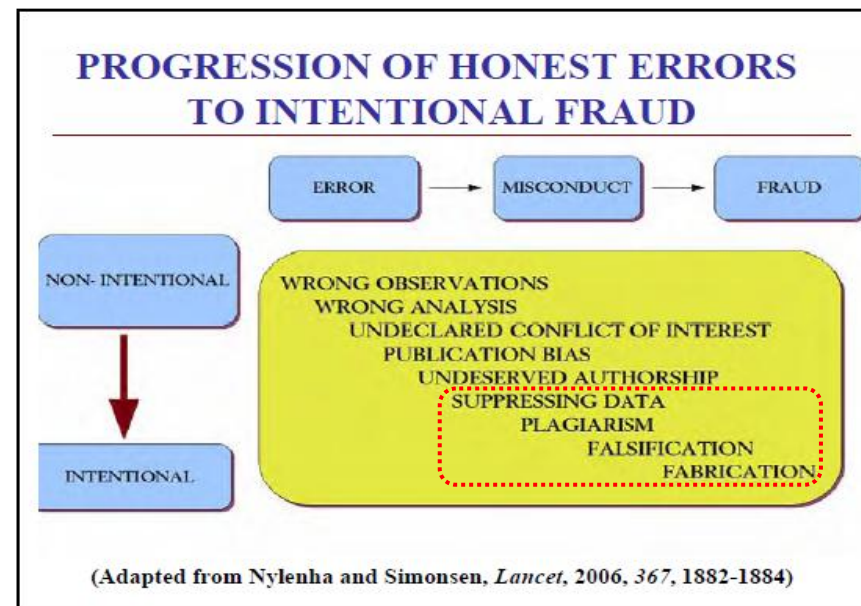
Google: academic fraud - the reader can choose among many more hits.

For simplicity, early analyses of the 2006 “Wegman Report” (WR) focused on the vast plagiarism. This report highlights a few of the many other problems that may rise to falsification or fabrication (**FF** hereafter).

Near-verbatim plagiarism may escape notice, but once found is easy to verify. FF sometimes needs more expertise to find or explain.

Suppose authors make strong claims counter to mainstream research. If they cite a credible source, but distort or silently contradict it, that may be falsification (misrepresentation.) Without backing citations, it seems more to be fabrication (invention.) If a citation is so vague that its coverage of the claims is unclear, the choice of falsification vs fabrication may also be unclear. In academe, either is serious as they make wrong claims, so they are often just lumped together here as FF to avoid distracting arguments.

Following is a helpful chart found in an Ohio State University presentation,¹ to which I’ve added the red rectangle for emphasis. “Suppressing data” might sometimes be considered a kind of falsification.



Honest errors happen. Incompetence can be hard to discern from intentional actions,² but the likelihood of intent increases as one discovers:

- Pervasive errors that almost always skew in support of a desired view. Each might be honest error, but en masse, seem increasingly intentional.
- Silent suppression/omission of data/text inconvenient to desired claims.
- **Plagiarism of credible text to fake expertise, but with removal of key phrases, persistent weakening or inversion of key conclusions.** This is illustrated in §3.

¹ A. Douglas Kinghorn, “Scientific Integrity Really Matters,” October 2006, www.pharmacy.ohio-state.edu/programs/medchem/faculty/kinghorn/sciinteg_oct06.pdf, p.5.

² Napoleon: “Never ascribe to malice, that which can be explained by incompetence.” However, the two easily coexist. Some WR errors are so silly as to imply obvious incompetence, but others show pervasive biases.

2 Plagiarism only the simplest problem in WR

The “Wegman Report” (WR) is: **Edward J. Wegman, David W. Scott, Yasmin H. Said**, “AD HOC COMMITTEE REPORT ON THE ‘HOCKEY STICK’ GLOBAL CLIMATE RECONSTRUCTION” (2006).³ This was an attack on climate scientists by people self-described:⁴

“None of our team had any real expertise in paleoclimate reconstruction, but were arguably pretty good statisticians.”⁵

In late 2009, Canadian blogger “**Deep Climate**” (DC) found that the WR had plagiarized and distorted⁶ Bradley(1999).⁷ Side-by-side comparisons of WR pages with Bradley soon appeared,⁸ but the joint WR authorship left room for ambiguity. In March 2010, Bradley sent formal plagiarism complaints to **George Mason University (GMU)** for Wegman and Rice University for Scott, the senior authors. Rice immediately recognized the issue, inquired and cleared Scott via evidence of Wegman responsibility.⁹ **DC had found many other issues, but for simplicity Bradley limited his complaint to plagiarism whose verification needed zero field expertise.**

Plagiarism can be really obvious, especially when shown side-by-side with highlighting, as here: **cyan** for identical words, locally in-order, **yellow** for trivial changes. Following is a short sample of DC’s work showing the WR at left, antecedent Bradley at right.¹⁰ The text at left is easily produced by cut-and-paste from the right, with simple copy-edits.

The WR uses unquoted, near-verbatim material from:

- several textbooks, at best vaguely attributed, but usually uncited
- Wikipedia, never attributed
- 17 summarized (and thus identified) papers.¹¹

As in the example below, some plagiarism adapts text without obvious or serious changes of meaning. It seems intended to create an (unearned) impression of expertise, as opposed to a claim of original research.

Some WR issues go well beyond simple plagiarism into distortion or misrepresentation and perhaps even purposeful falsification or fabrication. If this is only incompetence, it is massive, but possible.

“Wegman – para 1

A cross section of a temperate forest tree shows variation of lighter and darker bands that are usually continuous around the circumference of the tree.

These bands are the so-called tree rings and are due to seasonal

effects. Each tree ring is composed of large thin-walled cells called early wood and smaller more densely packed thick walled cells called late wood.”

“Bradley – 10.2

A cross section of most temperate forest trees will show an alternation of lighter and darker bands, each of which is usually continuous around the tree circumference.

These are seasonal growth increments produced by meristematic tissues in the tree's cambium. When viewed in detail (Fig. 10.1) it is clear that they are made up of sequences of large, thin-walled cells (earlywood) and more densely packed, thick-walled cells (latewood). Collectively, each couplet of earlywood and latewood comprises an annual growth increment, more commonly called a tree ring.”

³ republicans.energycommerce.house.gov/108/home/07142006_Wegman_Report.pdf

⁴ Yasmin H. Said, “Experiences with Congressional Testimony: Statistics and The Hockey Stick,” September 7, 2007, p.6. Original at GMU deleted, copy kept at: deepclimate.files.wordpress.com/2010/09/said-talksept7.pdf

⁵ deepclimate.org/2010/11/16/replication-and-due-diligence-wegman-style

⁶ deepclimate.org/2009/12/17/wegman-report-revisited

⁷ Raymond S. Bradley, *Paleoclimatology – Reconstructing Climates of the Quaternary, 2nd Edition*, Elsevier, 1999.

⁸ deepclimate.org/2009/12/22/wegman-and-rapp-on-tree-rings-a-divergence-problem-part-1; deepclimate.org/2010/01/06/wegman-and-rapp-on-proxies-a-divergence-problem-part-2

⁹ www.desmogblog.com/gmu-still-paralyzed-wegman-and-rapp-still-paranoid deepclimate.org/2011/01/06/wegman-on-deep-climate

¹⁰ deepclimate.files.wordpress.com/2010/07/wegman-bradley-tree-rings-v20.pdf (the example above). Thanks to DC for providing the Word file. deepclimate.files.wordpress.com/2010/07/wegman-bradley-ice-cores-corals-v2.pdf

¹¹ Even when sources are identified, extensive use of unquoted near-verbatim text is still plagiarism. Errors happen: sloppy scholars might include **verbatim** text and forget to quote it. However, **near-verbatim** text takes effort to edit, although it does have the effect of foiling some automated plagiarism-checkers. I cannot know if that was the intent, but one may wonder.

Good scholars either quote a cited source exactly or summarize it in their own words. They do not cut-paste-and-edit. Whether the text at left cited Bradley or not, it would be considered plagiarism.

GMU's own advice is clear:¹²

“Always remember, borrowing (both language and syntax) too heavily from a source, even if you cite it, is plagiarism. A good thing to keep in mind is to use no more than two of the author's original words.”

Good scholarship demonstrates expertise, but plagiarism often tries to fake it. With proper citations, direct quotes can be checked for correctness and summaries checked to assure they avoid misinterpretation. Good summaries show understanding, whereas cut-and-paste demonstrates the opposite, especially if the process injects obvious errors.

Some errors might be accidents¹³, but pervasive changes of meaning seem more likely to be falsification. Eventually, 35 of 91 WR pages¹⁴ were found to have substantial plagiarism of this sort, but many other serious problems emerged, detailed in *Strange Scholarship in the Wegman Report (SSWR)*.¹⁵ It cataloged many errors, meaning changes and obvious biases.

Soon thereafter, Bradley's plagiarism complaint emerged to public notice when USA Today's Dan Vergano wrote “**University investigating prominent climate critic.**”¹⁶ and “**Experts claim 2006 climate report plagiarized.**”¹⁷ Some readers focused entirely on Bradley's small part of the total alleged plagiarism, but many more problems have been found, some of which plausibly rise to FF status. Bradley also complained about plagiarism in the paper Said, et al(2008), derived from part of the WR. It also showed many problems beyond plagiarism and is being retracted.¹⁸

¹² writingcenter.gmu.edu/resources-template.php?id=1

¹³ “Once is an accident. Twice is coincidence. Three times is an enemy action.”

Ian Fleming, in *Goldfinger*.

¹⁴ 10 pages by DC, 25 (easier pages) by me.

¹⁵ deepclimate.org/2010/09/26/strange-scholarship-wegman-report

¹⁶ content.usatoday.com/communities/sciencefair/post/2010/10/wegman-plagiarism-investigation-1

¹⁷ www.usatoday.com/weather/climate/globalwarming/2010-11-21-climate-report-questioned_N.htm

¹⁸ www.desmogblog.com/mashey-report-reveals-wegman-manipulations

Given substantial blocks of identifiable antecedent text, changes become more obvious. The reader can ignore the cyan and yellow, and more easily focus on the remainder. In writing SSWR, I noticed some of the errors and potential FF problems only after highlighting removed the noise.

The next sections show WR pp. 13-14 with different annotations:

- The first shows the original text and raises questions for thought. Readers can evaluate the impression conveyed.
- The second offers likely answers to those questions, then shows DC's work to identify plagiarism and other issues.¹⁹
- The third builds on DC's analysis²⁰ and highlights plausible fabrications/falsifications red and some unattributed, non-peer-reviewed text grey.²¹

I hope academic experts on misconduct will offer opinions on how their universities would categorize the various issues here:

- Falsification or misrepresentation
- Fabrication or invention
- Some other form of academic misconduct
- Mere serious incompetence and poor scholarship, including inability to understand a textbook well enough to summarize it correctly
- Balance of assessment between individual cases and overall patterns

Pervasiveness, omissions and direct inversions of a source can be evidence of intent, especially in the context of similar issues found elsewhere in the WR. I will be interested to hear experts' opinions.

¹⁹ That version uses the left column of DC's side-by-side, reformatted slightly. deepclimate.files.wordpress.com/2010/07/wegman-bradley-tree-rings-v20.pdf DC's formatting is: “Regular font indicates substantially close wording between the two sources, *italic* represent paraphrased sections,” Cyan highlight shows exact copy, yellow shows trivial changes. Underlining shows DC-selected issues. Any reader in doubt about plagiarism should study DC's side-by-side.

²⁰ deepclimate.org/2009/12/17/wegman-report-revisited

²¹ Microsoft Word offers a fixed palette of 15 highlighting colors, of which most seem chosen for eyestrain. SSWR originally used light grey. I wanted to add a second highlight, but dark grey worked poorly. DC suggested the cyan/yellow combination we both adopted. Red and bright green seem enduring for short phrases. Black is good for redaction. That leaves 9 colors whose usage is unclear.

3 Wegman Report tree ring discussion

3.1 WR tree ring discussion pp.13-14, original

People might read these paragraphs with a few questions in mind:

- a) Is much of this discussion derived from Bradley(1999)?
- b) Do the WR authors seem knowledgeable about tree rings?
- c) Do paleoclimate researchers understand the “confounding factors?”
- d) Can tree rings be used to determine long-term effects, past variables?

The next page suggests answers plausible by casual readers, compared with those likely by people familiar with the field or Bradley’s book. Then, the same text is shown with DC’s plagiarism highlighting.

WR pp.13-14, original, no annotations

“Tree Rings – A cross section of a temperate forest tree shows variation of lighter and darker bands that are usually continuous around the circumference of the tree. These bands are the so-called tree rings and are due to seasonal effects. Each tree ring is composed of large thin-walled cells called early wood and smaller more densely packed thick walled cells called late wood. The average width of a tree ring is a function of many variables including the tree species, tree age, stored carbohydrates in the tree, nutrients in the soil, and climatic factors including sunlight, precipitation, temperature, wind speed, humidity, and even carbon dioxide availability in the atmosphere. Obviously there are many confounding factors so the problem is to extract the temperature signal and to distinguish the temperature signal from the noise caused by the many confounding factors. Temperature information is usually derived from interannual variations in the ring width as well as interannual and intra-annual density variations. Density variations are valuable in paleoclimatic temperature reconstructions because they have a relatively simple growth function that, in mature trees, is approximately linear with age. The density variations have been shown empirically to contain a strong climatic temperature signal. Two values of density are measured within each growth ring: minimum density representing early wood and maximum density representing late wood. Maximum density values are strongly correlated with April to August mean temperatures in trees across the boreal forest from Alaska to Labrador, Schweingruber et al., (1993). Both tree ring width and density data are used in combination to extract the maximal climatic temperature signal.

Climate signal is strongest in trees that are under stress. Trees growing in sites where climate does not limit growth tend to produce rings that are uniform. Trees that are growing close to their extreme ecological range are greatly influenced by climate. Climate variations strongly influence annual growth increments. Two types of stress are commonly recognized, moisture stress and temperature stress. Trees growing in semiarid regions are limited by water availability and thus variations in ring width reflect this climatic moisture signal. Trees growing near to their ecological limits either in terms of latitude or altitude show growth limitations imposed by temperature and thus ring width variations in such trees contain a relatively strong temperature signal. However, the biological processes are extremely complex so that very different combinations of climatic conditions may cause similar ring width increments. Tree growth and carbohydrate production by a tree in one year will precondition the tree for strong growth in the subsequent year so that there is a strong autocorrelation in the ring width time series. Photosynthetic processes are accelerated with the increased availability of carbon dioxide in the atmosphere and, hence, it is conjectured that ring growth would also be correlated with atmospheric carbon dioxide; see Graybill and Idso (1993). In addition, oxides of nitrogen are formed in internal combustion engines that can be deposited as nitrates also contributing to fertilization of plant materials. It is clear that while there are temperature signals in the tree rings, the temperature signals are confounded with many other factors including fertilization effects due to use of fossil fuels.

Wider rings are frequently produced during the early life of a tree. Thus the tree rings frequently contain a low frequency signal that is unrelated to climate or, at least, confounded with climatic effects such as temperature. In order to use tree rings as a temperature signal successfully, this low frequency component must be removed. This is typically done by a nonlinear parametric trend fit using a polynomial or modified exponential curve. Because the early history of tree rings confounds climatic signal with low frequency specimen specific signal, tree rings are not usually effective for accurately determining low frequency, longer-term effects. Once there is reasonable confidence that the tree ring signal reflects a temperature signal, and then a calibration is performed using the derived tree ring data and instrumented temperature data. The assumption in this inference is that when tree ring structure observed during the instrumented period that is similar to tree ring structure observed in the past, both will have correspondingly similar temperature profiles. As pointed out earlier, many different sets of climatic conditions can and do yield similar tree ring profiles. Thus tree ring proxy data alone is not sufficient to determine past climate variables. See Bradley (1999) for a discussion of the fitting and calibration process for dendritic-based temperature reconstruction.”

3.2 WR tree ring discussion plus DC plagiarism highlighting

For each question, two plausible answers are given, the 1st for a casual reader, the *Italicized 2nd* for someone familiar with Bradley(1999).

- Is much of this discussion derived from Bradley(1999)?
Probably not, the ending citation seems to cover just a small part.
Yes, DC found obvious plagiarism, shown on this page.
- Do the WR authors seem knowledgeable about tree rings?
Yes, this is written in a firm authoritative style, with technical words.
No, clear from errors here and elsewhere in the WR.
- Do paleoclimate researchers know about the “confounding factors?”
Doubtful, as there seem to be many problems.
Yes, much of Bradley describes confounding factors and their handling.
- Can tree rings be used to determine long-term effects, past variables?
No, the WR says specifically and firmly that they cannot.
Yes, Bradley explains how in detail for trends and variables.

#2 WR pp.13-14 with Deep Climate’s highlighting for plagiarism

Tree-Rings- A cross section of a temperate forest tree shows variation of lighter and darker bands that are usually continuous around the circumference of the tree. These bands are the so-called tree rings and are due to seasonal effects. Each tree ring is composed of large thin-walled cells called early wood and smaller more densely packed thick walled cells called late wood. The average width of a tree ring is a function of many variables including the tree species, tree age, stored carbohydrates in the tree, nutrients in the soil, and climatic factors including sunlight, precipitation, temperature, wind speed, humidity, and even carbon dioxide availability in the atmosphere. Obviously there are many confounding factors so the problem is to extract the temperature signal and to distinguish the temperature signal from the noise caused by the many confounding factors. Temperature information is usually derived from interannual variations in the ring width as well as interannual and intra-annual density variations. Density variations are valuable in paleoclimatic temperature reconstructions because they have a relatively simple growth function that, in mature trees, is approximately linear with age. The density variations have been shown empirically to contain a strong climatic temperature signal. Two values of density are measured within each growth ring: minimum density representing early wood and maximum density representing late wood. Maximum density values are strongly correlated with April to August mean temperatures in trees across the boreal forest from Alaska to Labrador, Schweingruber et al., (1993). Both tree ring width and density data are used in combination to extract the maximal climatic temperature signal.

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3.3 WR tree ring discussion, plagiarism plus more issues

This version highlights alleged FF problems in red and shows dubiously-sourced ideas in grey, enumerating issues and corresponding Bradley page numbers at left. Later pages discuss some in more detail..

- f₁¹⁰: “carbon dioxide” is part of a more complex argument
- f₂¹⁰: “many confounding factors” #1.
- f₃¹⁰: “many confounding factors” #2.
- F₄¹⁰: The WR selectively omits Bradley text that contradicts F₁₀¹⁰.
- f₅¹⁰: “relatively strong temperature signal” ← “strong temperature” signal.
- f₆¹⁰: “engines” and “fossil fuels” form part of another complex argument.
- f₇¹⁰: “confounded” #3.
- f₈¹⁰: “confounded” #4.
- f₉¹⁰: “confounded” #5.
- F₁₀¹⁰: “longer-term” The WR directly contradicts Bradley.
- F₁₁¹⁰: “not sufficient” The WR directly contradicts Bradley.

WR pp.13-14, FF problems highlighted in red, annotated

398 Tree-Rings- A cross section of a temperate forest tree shows variation of lighter and darker bands that are usually continuous around the circumference of the tree. These bands are the so-called tree rings and are due to seasonal effects. Each tree ring is composed of large thin-walled cells called early wood and smaller more densely packed thick walled cells called late wood. The average width of a tree ring is a function of many variables including the tree species, tree age, stored carbohydrates in the tree, nutrients in the soil, and climatic factors including sunlight, precipitation, temperature, wind speed, humidity, and even carbon dioxide availability in the atmosphere. Obviously there are many confounding factors so the problem is to extract the temperature signal and to distinguish the temperature signal from the noise caused by the many confounding factors. Temperature information is usually derived from interannual variations in the ring width as well as interannual and intra-annual density variations. Density variations are valuable in paleoclimatic temperature reconstructions because they have a relatively simple growth function that, in mature trees, is approximately linear with age. The density variations have been shown empirically to contain a strong climatic temperature signal. Two values of density are measured within each growth ring: minimum density representing early wood and maximum density representing late wood. Maximum density values are strongly correlated with April to August mean temperatures in trees across the boreal forest from Alaska to Labrador, Schweingruber et al., (1993). Both tree ring width and density data are used in combination to extract the maximal climatic temperature signal.

400 Climate signal is strongest in trees that are under stress. Trees growing in sites where climate does not limit growth tend to produce rings that are uniform. Trees that are growing close to their extreme ecological range are greatly influenced by climate. Climate variations strongly influence annual growth increments. Two types of stress are commonly recognized, moisture stress and temperature stress. Trees growing in semiarid regions are limited by water availability and thus variations in ring width reflect this climatic moisture signal. Trees growing near to their ecological limits either in terms of latitude or altitude show growth limitations imposed by temperature and thus ring width variations in such trees contain a relatively strong temperature signal. However, the biological processes are extremely complex so that very different combinations of climatic conditions may cause similar ring width increments. Tree growth and carbohydrate production by a tree in one year will precondition the tree for strong growth in the subsequent year so that there is a strong autocorrelation in the ring width time series. Photosynthetic processes are accelerated with the increased availability of carbon dioxide in the atmosphere and, hence, it is conjectured that ring growth would also be correlated with atmospheric carbon dioxide; see Graybill and Idso (1993). In addition, oxides of nitrogen are formed in internal combustion engines that can be deposited as nitrates also contributing to fertilization of plant materials. It is clear that while there are temperature signals in the tree rings, the temperature signals are confounded with many other factors including fertilization effects due to use of fossil fuels.

406 Wider rings are frequently produced during the early life of a tree. Thus the tree rings frequently contain a low frequency signal that is unrelated to climate or, at least, confounded with climatic effects such as temperature. In order to use tree rings as a temperature signal successfully, this low frequency component must be removed. This is typically done by a nonlinear parametric trend fit using a polynomial or modified exponential curve. Because the early history of tree rings confounds climatic signal with low frequency specimen specific signal, tree rings are not usually effective for accurately determining low frequency, longer-term effects. Once there is reasonable confidence that the tree ring signal reflects a temperature signal, and then a calibration is performed using the derived tree ring data and instrumented temperature data. The assumption in this inference is that when tree ring structure observed during the instrumented period that is similar to tree ring structure observed in the past, both will have correspondingly similar temperature profiles. As pointed out earlier, many different sets of climatic conditions can and do yield similar tree ring profiles. Thus tree ring proxy data alone is not sufficient to determine past climate variables. See Bradley (1999) for a discussion of the fitting and calibration process for dendritic-based temperature reconstruction.

3.4 Analysis of issues

The WR 1st paragraph is near-verbatim Bradley. So is the first part of the 2nd paragraph, followed by a properly-cited, but doubt-raising sentence.²² The grey section of the 2nd paragraph likely derives from dubious sources (non-peer-reviewed papers or blogs.)²³ The first part of the 3rd paragraph is Bradley's, followed by plausibly-paraphrased text and finally a vague citation. **Bradley is methodically weakened, silently contradicted or even directly inverted by the red-highlighted text.** The WR mimics expertise by copying or paraphrasing Bradley, but often injects doubt-casting changes. The WR's pervasive use of "confounding" seems especially targeted at statisticians (rightfully) sensitive to that term, but unfamiliar with paleoclimate. One would never know Bradley's 600-page book describes confounding factors and their solutions in great detail.

Issues are categorized (obviously with some subjective judgment) as:

- f_i** weakening of some sources, exaggeration of others or individually arguable changes, but part of a pattern of bias or distortion
- F_i** major changes of meaning, in this case contradiction of the antecedent text, either directly or by careful omission.

Given an expert source that carefully explains confounding factors²⁴ and their handling, novices cannot claim to nullify that work just by sprinkling "confounding" through plagiarized text: **f₂**, **f₃**, **f₇**, **f₈**, **f₉**.

By itself, **f₅**, the addition of "relatively" to "strong temperature signal" might be ignored as a minor wording change, unnoticed but for its explicit insertion in a block of copied text. In that context it seems yet another instance of the WR's pervasive doubt-casting.

²² This was conjectured by Graybill and Idso (1993), but newer results argue against them, as in www.pnas.org/content/106/48/20348.short. I also heard stronger results presented by Malcom Hughes at AGU, December 2010. This does not fit in the list. The WR overgeneralizes from a study of one form of one species.

²³ deepclimate.org/2010/09/26/strange-scholarship-wegman-report, W.6, pp.161-162 on nitrates. This seems obscure for statisticians new to this.

²⁴ For balanced views by experts search the PDF of the NRC report for "confounding." The 161-page document has 5 hits, explaining both their existence and their handling. The WR referenced the NRC report, but ignored it.

books.nap.edu/openbook.php?record_id=11676&page=R1

The Bradley page number annotations help infer the WR construction:

- Text is cut-and-pasted (**cyan**) from Bradley 10.2, especially from the first paragraphs of 10.2.1, 10.2.3, and 10.2.4.
- Trivial changes are made (**yellow**).
- Various weakenings are inserted (**red**, as are the following).
- Relatively esoteric ideas (**f₁₀** and **f₆**) not found in Bradley pp.403-405 are sandwiched between text from Bradley pp.402 and 406.
- The WR then inverts two important Bradley conclusions, in essence declaring tree-ring temperature reconstructions unusable.
- Finally, an ambiguous (and wrong) citation of Bradley appears (**green**).

Arguments **f₁₀** and **f₆** insert plausible-sounding, but marginal effects whose discussions are complex and rather specialized. It is odd for self-admitted novices to reference these. *One might wonder if they got help.*²⁵ Reconstructions of temperature over the last 1,000 years use data since 1880 to help calibrate effects versus modern temperature measurements, and these arguments cast doubt on the relevance of the calibration period:

f₁₀: "carbon dioxide availability" is part of a more complex argument that casts doubt on tree-ring research. Plant growth is constrained by the factor in least supply (Liebig's Law). Under some circumstances, increased CO₂ helps some plants grow, but of course, the real increase in CO₂ has occurred during the last 150 years. This can matter, but not very much, which is why Bradley does not discuss it.

f₆: "engines" and "fossil fuels" form part of another complex argument inserted. There is much less evidence for any large-scale effect, especially as most relevant tree-rings are remote from dense human habitations. Internal combustion engines are relatively recent on a millennial scale, so they certainly do not affect most of that time. This claim is unattributed and likely originated outside the peer-reviewed literature, specifically from the two people attacking the hockey stick.

So far, any single issue might be arguable, but as a group, they exhibit strong, pervasive bias. The rest seem individually clear - the WR strongly misleads once by omission and twice by explicit inversion.

²⁵ One wonders if there were any unacknowledged reviewers/editors.

Selective omission F₄

F₄: The WR plagiarizes a few sentences of Bradley, but selectively omits text shown with strike-through at right. Bradley spends 5 pages (Section 10.2.3) to explain ways to extract low-frequency (longer-term) trends. The first part of the WR 3rd paragraph is derived from that Section. If this were quoted, with ellipses, the misrepresentation

would be obvious. Bradley says tree rings are useful for long-term effects, but novices contradict his conclusion via explicit omission F₄ and then direct inversion F₁₀. From the cut-and-paste pattern, the WR clearly used Bradley's text, removing inconvenient elements and then directly contradicting it.

WR:

"Density variations are valuable in paleoclimatic temperature reconstructions because they have a relatively simple growth function that, in mature trees, is approximately linear with age. The density variations have been shown empirically to contain a strong climatic temperature signal. Two values of density are measured within each growth ring: minimum density representing early wood and maximum density representing late wood."

Bradley, p.399:

"It has also been shown empirically that density variations contain a strong climatic signal and can be used to estimate long-term climatic variations over wide areas (Schweingruber *et al.*, 1979,1993). ... Density variations are particularly valuable in dendroclimatology because they have a relatively simple growth function (often close to linear with age). Hence standardization of density data may allow more low-frequency climatic information to be retained than is the case with standardized ring-width data (see Section 10.2.3)." Generally, two values are measured in each growth ring: minimum density and maximum density (representing locations within the earlywood and latewood ..."

Direct inversion F₁₀

F₁₀: The WR directly inverts (expert) Bradley. F₄ omits unwanted text, but this next text directly contradicts Bradley.

WR:

"tree rings are not usually effective for accurately determining low frequency, longer-term effects"

Bradley: no direct antecedent, but sentence at left directly contradicts Bradley above, from which the earlier WR text was taken.

Direct inversion F₁₁

F₁₁: The WR directly inverts Bradley. People attempt to discredit an entire research field. They even mislabel it: "dendritic" is not "dendroclimatic" but is simply wrong, as it refers to branching, not tree rings. If all this is merely incompetence, it is so extreme that the authors have zero credibility writing anything on the topic.

The last sentences of the WR 3rd paragraph are paraphrased from Bradley, but then directly invert the most important conclusion. Bradley writes that tree rings alone can be sufficient, the WR says they are not. The green highlighting is explained on the next page.

WR:

Once there is reasonable confidence that the tree ring signal reflects a temperature signal, and then a calibration is performed using the derived tree ring data and instrumented temperature data. The assumption in this inference is that when tree ring structure observed during the instrumented period that is similar to tree ring structure observed in the past, both will have correspondingly similar temperature profiles. As pointed out earlier, many different sets of climatic conditions can and do yield similar tree ring profiles. Thus tree ring proxy data alone is not sufficient to determine past climate variables. See Bradley (1999) for a discussion of the fitting and calibration process for dendritic-based temperature reconstruction.

Bradley Section 10.2.4, p.412:

"Once a master chronology of standardized ring-width indices has been obtained, the next step is to develop a model relating variations in these indices to variations in climatic data. This process is known as calibration, whereby a statistical procedure is used to find the optimum solution for converting growth measurements into climatic estimates. If an equation can be developed that accurately describes instrumentally observed climatic variability in terms of tree growth over the same interval, then paleoclimatic reconstructions can be made using only the tree-ring data. In this section, a brief summary of the methods used in tree-ring calibration is given."

If the WR had properly quoted and cited sentences from Bradley, the inserted weakenings and contradictions would have been obvious. The vague ending citation (green) creates ambiguity between fabrication and falsification, and as noted, includes yet another silly terminology error that implies unfamiliarity with the topic. It is not FF, just wrong, so not red.

- a) If the ending citation is supposed to cover all the text, in effect claiming to be a paraphrase of Bradley, that might be called **falsification** or misrepresentation, since it strongly contradicts his text, both directly and by continual weakening.
- b) If the ending citation just corresponds to Bradley 10.2.4, most of the WR text seems uncited **fabrication**, credible-sounding words that often contradicts mainstream research with little basis.

To a casual reader, this text may look authoritative and might seem as though it is paraphrased from Bradley. The poor citation may just be incompetence, but it is difficult to find a positive interpretation.

Most text in this WR section is either near-verbatim plagiarism (P) or insertion of doubts and silent contradictions, thus plausible FF.

It is impossible to rule out its insertion or suggestion by unacknowledged reviewers or that different people did the plagiarism/editing. Still, Wegman and Said were responsible.

Wegman wrote about this to Donald Rapp, September 2010:²⁶

“Of course, in the so-called Wegman report, we make it clear that we were not trying to represent ourselves as the inventors of paleoclimate reconstruction via tree rings as Bradley implies. Indeed, we explicitly say that these materials were included **so as to give the Congressional audience a balanced picture of the area.**”

Plagiarism is often used to create an impression of unearned expertise, rather than to claim invention. In contradiction to scholarly norms, Wegman and some of his students seem to think otherwise.

It is interesting to read that total novices think they can provide a balanced view of a field by plagiarizing expert work and then distorting it.

²⁶ www.desmogblog.com/sites/beta.desmogblog.com/files/strange%20inquiries%20v2%200_0.pdf p.38. Of course, most of this was found long ago by DC.

3.5 Tree rings summary

What would non-expert readers think if they read this WR section?

Readers unfamiliar with the field might likely:

- study this section carefully as an introduction to a key topic
- get a clear impression of problems with tree-rings
- not obtain a copy of Bradley to check.

But why did experts fail to notice the plagiarism and other issues?

The WR pages immediately preceding this WR text use (properly-cited) tables from Bradley²⁷ and the text ends with a (vague) citation to Bradley. Field experts are much less likely to study introductory material in a long report than are non-experts.²⁸ An expert might likely:

- see relevant and familiar words
- see a famous textbook mentioned several times
- skim quickly and skip to the seemingly-new results in later WR sections.

Of course, many people only read Executive Summaries anyway.

Proper arguments

Scholarly papers often properly cite an expert source, then argue by citing other sources or new data. The WR silently uses Bradley’s text, but every change seems to attack its credibility. Issue F₁₁ essentially declares an entire research field worthless, despite substantial evidence otherwise.

Incompetence, honest error or purposeful falsification/fabrication?

The reader may have formed an opinion. Reasonable people can differ.

My opinion: I think most of this is purposeful, having studied the entire WR in great detail and enumerated many other examples, of which I describe just a few more from SSWR.²⁹

²⁷ deepclimate.org/2010/09/26/strange-scholarship-wegman-report, W.2.1.

The tables are mostly irrelevant. Flawed copies inject some truly silly errors.

²⁸ www.colorado.edu/news/reports/churchill/StandingCmteReport.html, pp.17-18 discusses reasons why such things are often missed.

²⁹ When I started SSWR, I assumed most problems arose from incompetence or lack of knowledge, but the pervasive accumulation of issues eroded that belief.

4 Sample of other FF issues from SSWR

Obsolete, distorted graph, sourced elsewhere. SSWR W.4.2.

F₁₂: One of the clearest cases is reliance on a long-obsolete graph from 1990, even distorted from the original to exaggerate a desired message (fabrication or misrepresentation). Wegman admits in testimony they actually had not read the source they mentioned, but no one asks how they got the graph. Of course, this could be incompetence in digitizing a simple graph, but ascribing a graph to an unavailable source seems odd.

“A Dummy’s Guide to Strange Scholarship in the Wegman Report II”³⁰ offers a brief discussion, including the original and distorted graphs. The WR strongly promotes the idea that the Medieval Warm Period was warmer than current temperatures, often contradicting their own references.

Bibliography-padding. SSWR W.8.

F₁₃: Bibliography-padding can also be a form of fabrication, and **40 of 80 references are never cited**, leading one to wonder if the WR authors had actually ever studied them. Many are clearly irrelevant or found in dubious sources inappropriate for such a report. A tabloid writer’s 1987 ozone article in a fringe technology magazine is listed as an “Academic paper.” It cannot possibly be relevant. It is impossible to prove that someone failed to read a reference, but the WR or testimony are often contradicted by the WR’s own references. Some uncited references do not even make sense as sources for further reading. SSWR W.8 is a 20-page analysis of the WR bibliography, much of which is irrelevant or dubious.

FF in summaries of papers. SSWR W.11.4, W.11.8.

Some FF cases require subject knowledge, but are more easily recognizable amidst plagiarized text. SSWR W.11.8 analyzes these 26 WR pages, mostly plagiarized text. W.11.4 tallies errors, changes of meaning and bias. Sometimes incompetence and deliberate FF are hard to distinguish, but the reader might study those coded both “C” and “B” - or major meaning change combined with bias.

Just one example is given here, from SSWR p.230:

³⁰ rabett.blogspot.com/2010/10/dummys-guide-to-strange-scholarship-in_17.html
 “Eli Rabett” highlights interesting slices of the complex SSWR.

F₁₄: The WR exaggerates words by critics McIntyre and McKittrick, who correctly describe the “hockey stick” as an important graphic. It is only one of many elements of evidence. It is not the “main endorsement” of the IPCC. This change is found amidst plagiarized text, see SSWR W.11.8:

WR, p.80, Paragraph 4

They also note the limited due diligence of paleoclimate journal peer review and that it would have been prudent to have checked the MBH98 data and methods against original data before accepting the findings as the main endorsement of the Intergovernmental Panel on Climate Change.

1. <CB>. MBH98 as the main endorsement of the IPCC?
 This is a major Change of Meaning, plus Bias, hence <CB>.

MM05a, p.90

recognizing the limited due diligence of paleoclimate journal peer review, it would have been prudent for someone to have actually checked MBH98 data and methods against original data before adopting MBH98 results in the main IPCC promotional graphics.

The “results in the main IPCC promotional graphics” part seems fair.
 The WR made an explicit change amidst copied text.

F₁₅: SSWR W.5.8 discusses WR Figure 5.8, which has many curious characteristics, including silent omission of half the data, the half that would have argued against the claims made. That is usually falsification.³¹

F₁₆: DC has provided a long discussion of bad statistics in the WR.³² Much of that may well be extreme incompetence, as it just re-uses Steven McIntyre’s work, including code that produced graphs not previously shown. This is not “independent verification.” Some of DC’s arguments require statistical expertise, but one is a simple case of extreme data omission. WR figure 4.4 was claimed as a “compelling illustration” and showed 12 graphs supposedly sampled from 10,000 cases. DC found that it was instead a sample of the 100 cases most favorable to the WR’s position. That could be incompetence, but in statistics, such extreme cherry-picking would likely be considered falsification.

³¹ And in this case, there are strong hints of an unacknowledged source, see p.17: www.desmogblog.com/mashey-report-reveals-wegman-manipulations

³² deepclimate.org/2010/11/16/replication-and-due-diligence-wegman-style

5 Conclusions

Once found, plagiarism is easy to see, even with minimal field expertise.³³

Finding falsification or fabrication (FF) needs more expertise, and explaining it is more complex. Either can be arguable, especially versus incompetence. Likewise, the point at which persistent patterns of bias rise to become falsification can be arguable.

One can understand why Bradley just mentioned plagiarism for simplicity.

Likewise, SSWR was already long enough, but enough people have asked about FF to encourage this report. In parallel, in the publicity and discussion that arose from the retraction of Said (2008)³⁴, some people clung to the idea that despite the plagiarism there, the conclusions held. That was wrong, but it did need more domain expertise to be sure and the reasons were different. Experts were asked and they panned the paper.³⁵ In that case, the methodology was poor and mis-used in several ways, and the authors leapt to conclusions unsupported by the data. It was a bad paper, and contained plagiarism, but I saw no obvious FF.³⁶

³³ Dan Vergano recently added an update to his October story, content.usatoday.com/communities/sciencefair/post/2010/10/wegman-plagiarism-investigation-1: GMU has not yet completed the inquiry phase: '[Update: GMU spokesman Dan Walsch clarified in the May 26, 2011, *Nature* journal that the year-old investigation is still in its preliminary "inquiry" stage, rather than a full investigation.

"In terms of my comments this past fall, my understanding of the internal procedure was not as clear then as it is now," Walsch says, by email.]'

³⁴ www.usatoday.com/weather/climate/globalwarming/2011-05-15-climate-study-plagiarism-Wegman_n.htm
content.usatoday.com/communities/sciencefair/post/2011/05/retracted-climate-critics-study-panned-by-expert-1

www.nature.com/nature/journal/v473/n7348/full/473419b.html Nature editorial

³⁵ www.desmogblog.com/mashey-report-reveals-wegman-manipulations

³⁶ *One citation was possibly a false citation.* In that case, text was originally derived from Wikipedia, used in the WR and re-used in Said(2008), which inserted a vaguely-relevant citation to Granovetter(1973) amidst the Wikipedia text. That might be a false citation or not. Addition of vaguely-related citations amidst plagiarism may be used to avoid writing large stretches of citation-less text, usually a red flag for critical reviewers. All this was discussed in

Sometimes vague citations create ambiguity between falsification and fabrication. Reasonable people might argue about some, but while WR pp.13-14 has the densest, simplest set of such issues, others pervade the WR, especially in the summaries of papers.³⁷

All this seems to argue against assumption of mere incompetence, but then, the level of incompetence also seems very high.

Using Bradley's own words to mimic nonexistent expertise is plagiarism, troublesome by itself. But the WR goes much further, selectively injecting changes amidst plagiarized text to weaken or even invert Bradley's conclusions. *It is difficult to see how this can be mere incompetence or anything but intentional distortion, whether or not it rises to falsification/fabrication. I am no expert on academic misconduct, but this combination seems strange and rare, especially in a high-profile report for the US Congress. Perhaps this is enough evidence to lead to evaluation and investigation by experts within academe and elsewhere.*

Hopefully, this report will stir relevant discussion.

Acknowledgements:

DC did the really hard work, unearthed the plagiarism originally and discussed many of the issues reanalyzed here. None of this would have happened otherwise. Thanks to Stephan Lewandowsky and several anonymous reviewers for detailed comments.

deepclimate.org/2010/09/26/strange-scholarship-wegman-report, as the WR and Said(2008) shared plagiarism and other problems.

³⁷ See SSWR 2.7, "page tally" for a section-by section summary of issues, and W.11.4 for detailed enumeration of 33 errors, 24 changes of meaning, and 37 biases identified in 26 pages of WR text. The reader might disagree with many, but the pattern is systematic and some examples are individually clear.

A.1 Other Examples

Useful articles include Wikipedia's "Academic dishonesty"³⁸ "Scientific Misconduct,"³⁹ with the usual caveats about Wikipedia and observation that definitions are sometimes ambiguous. When falsification or fabrication are found, they often seem to be created by researchers "stretching" for significant results. Falsified/fabricated laboratory data may need serious work to discover.⁴⁰ The WR's possible FF seems unusual.⁴¹ A case with possible structural similarity (not lab data, but words), although of much clearer nature, might be that of Ward Churchill:

In a long discussion at deepclimate.org "Robert P" mentioned⁴² the complex, contentious Ward Churchill case at University of Colorado, Boulder. Wikipedia has a helpful summary⁴³ and a UCB web page links to a long sequence of reports.⁴⁴ Especially useful here is the "Report and Recommendations of the Standing Committee on Research Misconduct Concerning Allegations of Research Misconduct by Professor Ward Churchill."⁴⁵ A few excerpts are:

p.7

"The Investigative Committee concluded, by a preponderance of the evidence, that Professor Churchill had committed research misconduct in the following forms:

- Falsification ...
- Fabrication ...
- Plagiarism ...

Moreover, the Investigative Committee concluded that the misconduct was serious, repeated, and deliberate."

³⁸ en.wikipedia.org/wiki/Academic_dishonesty

³⁹ en.wikipedia.org/wiki/Scientific_misconduct

⁴⁰ en.wikipedia.org/wiki/Jan_Hendrik_Sch%C3%B6n

⁴¹ I have asked various academic friends for experiences with similar examples, but people seem unable to suggest many. It is easy to find university policies, but far less easy to find public reports of comparable examples.

⁴² deepclimate.org/2010/12/23/george-mason-universitys-endless-inquiry/#comment-7021

⁴³ en.wikipedia.org/wiki/Ward_Churchill

⁴⁴ www.colorado.edu/news/reports/churchill/

⁴⁵ www.colorado.edu/news/reports/churchill/StandingCmteReport.html

p.10

'Seriousness. The SCRM fully concurs with the Investigative Committee's conclusion that the pattern of violations documented in its report represents serious misconduct. **The SCRM acknowledges that any scholar can make an occasional mistake**, particularly when producing the volume of writing that Professor Churchill claims; indeed, most definitions of research misconduct (including UCB's) specifically exclude honest error. **But the Investigative Committee convincingly demonstrated a pattern of intentional errors.** We are forced to conclude, as did the Investigative Committee, that this is not a case of "ordinary error," but a pattern of repeated, intentional misrepresentation.'

pp.11-12

'Deliberateness and Remedial Potential. The SCRM also was influenced in its deliberations by the Investigative Committee's conclusion that the misconduct they identified was deliberate...

We are drawn to the irresistible conclusion that Professor Churchill is unable, or at least unwilling, to acknowledge legitimate critique. If he is unwilling to acknowledge the critiques, we are pessimistic that he is likely to change his behavior.'

The UCB committee gave weight to patterns of errors rather than just assessing each alone. To be very clear, the FF alleged here in the WR is not being portrayed as extreme as that of Churchill.

Wegman has so far rejected the plagiarism complaints:

"By email, he said, "there is a lot of speculation and conspiracy theory in John Mashey's analysis which is simply not true." He added, "we have never intended that our Congressional testimony was intended to take intellectual credit for any aspect of paleoclimate reconstruction science or for any original research aspect of social network analysis."⁴⁶

This view persists today,⁴⁷

"Neither Dr. Wegman nor Dr. Said has ever engaged in plagiarism," says their attorney, Milton Johns, by e-mail.'

So far, Wegman has yet to respond meaningfully to the numerous detailed issues exposed so far. FF is more complex than plagiarism so one might expect a long process at GMU.

⁴⁶ content.usatoday.com/communities/sciencefair/post/2010/11/wegman-report-round-up/1

www.desmogblog.com/gmu-paralyzed-plagiarism-investigation

⁴⁷ www.usatoday.com/weather/climate/globalwarming/2011-05-15-climate-study-plagiarism-Wegman_n.htm