

Intro to Fact Checking (and the Library!)

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Four Moves...

- **Check for previous work:** Look around to see if someone else has already fact-checked the claim or provided a synthesis of research.
- **Go upstream to the source:** Go “upstream” to the source of the claim. Most web content is not original. Get to the original source to understand the trustworthiness of the information.
- **Read laterally:** Read laterally. Once you get to the source of a claim, read what other people say about the source (publication, author, etc.). The truth is in the network.
- **Circle back:** If you get lost, hit dead ends, or find yourself going down an increasingly confusing rabbit hole, back up and start over knowing what you know now. You’re likely to take a more informed path with different search terms and better decisions.

From Mike Caulfield's book *Web Literacy for Student Fact-Checkers*: <https://webliteracy.pressbooks.com>

Go over the Four Moves briefly

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For this class we will be focusing on number 2 and 3, since those are most useful for fact checking the scholarly literature (and often reporting on science in general)

...and a Habit

- **Check your emotions:** The habit is simple. When you feel strong emotion—happiness, anger, pride, vindication—and that emotion pushes you to share a “fact” with others, STOP. Above all, these are the claims that you must fact-check.

Why? Because you're already likely to check things you know are important to get right, and you're predisposed to analyze things that put you in an intellectual frame of mind. But things that make you angry or overjoyed, well... our record as humans are not good with these things.

From Mike Caulfield's book *Web Literacy for Student Fact-Checkers*: <https://webliteracy.pressbooks.com>

Emotions are not bad – they are just a cue for us to take a step back and look closely at what we are reading.

Example article:



NATION NOW

Yellowstone supervolcano may blow sooner than thought — and could wipe out life on the planet

kng5.tv/2naMKOH

Have students go to the link provided.

Ask: what emotions do you feel reading the headline (or if they are reluctant, what emotion do you think you are supposed to feel)?

What claim(s) is the article making?

kng5.tv/2naMKOH

Identify the two main claims of the article: the supervolcano under Yellowstone is going to explode soon, and it's going to wipe out life on earth when it does.

Go Upstream

- Follow links (and keep following until you get to the source)
- Look for other clues about where the information originated. For example:
 - Does the article mention researchers by name? Google them!
 - Does it mention a particular university? Look at the relevant departments!

kng5.tv/2naMKOH

Students practice going upstream using the article. Circulate. Encourage students to try many different strategies for going upstream, such as following links and Googling any kind of context clues they can find.

Note: the students I worked with had a little trouble finding the actual abstract of the conference presentation (they found the conference website just fine), so encourage them to keep looking!

After about 10ish minutes of searching, discuss what they have found with the entire class.

Ask: Has anything you found changed your opinion about the claims in the original article? How has your opinion and/or feelings changed?

Draw out observations about how the sources further upstream differ. One thing that my students noticed is the increased presence of hedging language as we got closer to the source. Words like “may” or “might” are important to pay attention to. The King5 article makes things sound much more certain than they actually are. We also talked about how most scientists never use certain language when talking about a discovery – they are more likely to say “the evidence points to this thing as the most likely scenario” not “this is true.”



Steam rises off the Grand Prismatic Spring, one of the most stunning hydrothermal features in Yellowstone National Park.

PHOTOGRAPH BY TOM MURPHY, NAT GEO IMAGE COLLECTION

1
click upstream

Yellowstone Supervolcano May Rumble to Life Faster Than Thought

A new study of ancient ash suggests that the dormant giant could develop the conditions needed to blow in a span of mere decades.

Examples of articles a few clicks upstream of the King5 article.

The New York Times ***A Surprise From the
Supervolcano Under Yellowstone***

2
clicks upstream



Prismatic Spring in Yellowstone National Park, a large hot spring known for its vibrant coloration. Beneath the powerful supervolcano which drives the spring and other geological activity. Marie-Louise Mandl/EyeEm, via Getty Im



Hannah Shamloo, Christy Till

Submission 1089

Petrologic Insights into the Timing and Triggering Mechanism of the Lava Creek Tuff Supereruption, Yellowstone Caldera, WY, USA

The Yellowstone caldera is infamous for its most recent supereruption ~630,000 years ago, which deposited >1000 km³ of rhyolite ash across the contiguous US known as the Lava Creek Tuff (LCT), however, little petrologic work has been done on the LCT. The aim of this study is to use LCT fallout ash to investigate the magmatic events that lead to eruption and over what timescale these events took place. The LCT fallout ash contains zoned sanidine and quartz phenocrysts with minor plagioclase and clinopyroxene and oxides along with lithic fragments and glass shards. Scanning electron microscope cathodoluminescent imaging of sanidine reveals three distinct populations; Pop. 1 has single thick (~200-600 μm) bright outermost rims and dark interiors; Pop.2 shows a more diverse zoning pattern with multiple bright and dark zones and thinner (~50-200 μm) outermost rims; Pop.3 are unzoned and nearly homogenous. Electron microprobe major element and NanoSIMS trace element analyses and feldspar-liquid thermometry performed on Pop. 1 and 2 sanidine (Or48-55) reveal hotter (~25°C) and Ba and Sr-rich, chemically less-evolved, outermost crystal rims relative to the crystal interiors suggesting the LCT experienced at least one rejuvenation event shortly before its eruption. Rhyolite-MELTS phase-equilibria modeling best agrees with the mineral compositions for a bulk water content of ~1 wt.% H₂O and a storage pressure of 3 kbar. NanoSIMS analyses reveal core-rim Ba and Sr concentration profiles of similar widths that require a formation mechanism dominated by crystal growth rather than diffusion, similar to that observed by Till et al. (2015) in Yellowstone post-caldera lavas. The slowest experimentally-derived sanidine growth rates (10-10 cm/s: Swanson et al., 1989) suggest conservative estimates of a few years to a couple of decades to grow the 50-600 μm Pop 1 and 2 sanidine rims after the rejuvenation and/or remelting of feldspar and mafic phases that chemically-altered the melt composition. Thus it seems likely that a reheating event contributed to the LCT's eruption in the years leading to the eruption.

3

clicks upstream
(source of the
claim)

Before going to the next slide, as students to copy and paste the headline from the King5 article into Google and report back on what they find.



Most content online is not original

Yellowstone supervolcano may blow sooner than thought

<https://www.tennessean.com> › story › travel › 2017/10/12 › yellowstone-sup...
Oct 12, 2017 - Yellowstone supervolcano may blow sooner than thought — could wipe out life on the planet. ... The discovery, which was presented at a recent volcanology conference, comes on top of a 2011 study that found that ground above the magma reservoir in Yellowstone had bulged by about 10 inches in seven years.

Yellowstone supervolcano may blow sooner than thought ...

<https://www.king5.com> › article › news › nation-now › yellowstone-super...
Oct 12, 2017 - Yellowstone supervolcano may blow sooner than thought — and could wipe out life on the planet. Wyoming: Yellowstone National Park is a ...

Yellowstone supervolcano may blow sooner than thought ...

<https://gazette.com> › yellowstone-supervolcano-may-blow-sooner-than-thou...
Oct 12, 2017 - Scientists working in and around Yellowstone National Park say that the ... attraction may blow sooner than thought, an eruption that could wipe out life on. ... It's also the third largest geyser in the world. It's wider than a football ...

Yellowstone supervolcano may erupt sooner than thought ...

<https://www.marketwatch.com> › ... › National news › The New York Post
Oct 13, 2017 - The supervolcano under Yellowstone National Park may erupt sooner than previously thought — and wipe out life on Earth, researchers warned this week. ... The volcano can belch out more than 1,000 cubic kilometers of rock and ash — 2,500 times more than was Mount St. Helens did in 1980, the ASU researchers found.

Yellowstone supervolcano may blow sooner than thought - Kiii

<https://www.kiitv.com> › article › news › yellowstone-supervolcano-may-b...
Oct 12, 2017 - Yellowstone supervolcano may blow sooner than thought — and could wipe out life on the planet. Researchers analyzed minerals in fossilized ...

Yellowstone supervolcano may erupt sooner than thought ...

<https://globalnews.ca> › news › yellowstone-supervolcano-erupt
Oct 13, 2017 - A supervolcano brewing under Yellowstone National Park could erupt sooner than initially thought, and if it does, it could wipe out life on the ... the world into ...

This slide illustrates why it's important to follow a claim upstream, rather than just see if lots of other sources agree. Since so much content is reprinted across multiple sites, it would be easy to believe that something if you just look for other sources that agree.

Ask: What would happen if you just fact checked by seeing if there are other sources that agree with your first source? Students mentioned getting stuck in a feedback loop of misinformation.

Read Laterally

When you've found the source of the claim, look into...

- The author
- Purpose of the publication
- Audience of the publication
- Reputation of the publication

We focused particularly on looking at the authors of the conference presentation (Christy Till and Hannah Shamloo), as well as the audience and reputation of the conference where the information was presented.

Give students 10 minutes to do some lateral reading.

Ask students to share what additional information they were able to find.

Ask: How has your lateral reading changed your opinion of the King5 article? Has it changed your opinion of the originators of the claim which was misrepresented in the King5 article?

You might find...

Professional websites

HANNAH I. SHAMLOO

[Home](#) [About Me](#) [Research](#) [Publications](#) [Outreach](#) [CV](#)



Seeing **Yellowstone** in the news a lot lately? Worried it's gonna blow? Here are some things you should know.

Research article



[Contributions to Mineralogy and Petrology](#)
April 2019, 174:32 | [Cite as](#)

**Decadal transition from quiescence to supereruption:
petrologic investigation of the Lava Creek Tuff,
Yellowstone Caldera, WY**

[Authors](#) [Authors and affiliations](#)

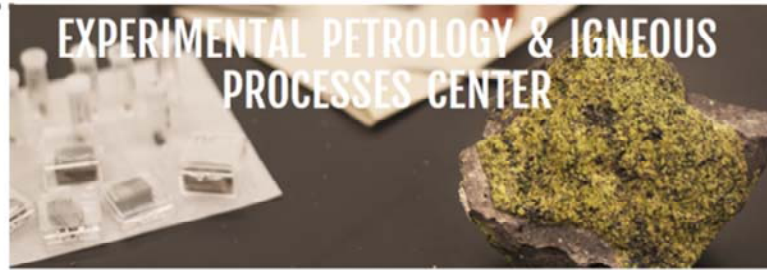
Hannah I. Shamloo , Christy B. Till

Some materials that students might find.

Use this opportunity to discuss why scientists might want to have a professional web presence.

You might find..

Research group



We study magma: how and why it forms, its composition and timescales, and the resulting

University press
release



October 17, 2017

With a new round of nuclear brinkmanship between Washington and Pyongyang and the fly-by of a near-Earth asteroid in the headlines the past few weeks, the last thing we needed was another doomsday scenario. Then worrisome news of a "planet-killing" supervolcano erupted last week, setting off a chain reaction of increasingly sensational headlines.

More examples

Discussion Questions

- Why would a news outlet like King5.com want to have catchy headlines?
- Why is it sometimes difficult for journalists to report accurately about scientific topics?
- Why is it important for us, as readers, to fact check articles and headlines?

Time to discuss these questions (10 minutes or so, as time allows). Tie this back to the work that the students will be doing as future researchers or scientists.

Expand your reading

- MSU Library website: lib.msu.edu
 - [Article Search](#)
 - [Subject Librarians](#)

Tools that students can use to investigate a topic further. Spent a little time showing them how to find additional scholarly articles through the library, and get connected with subject librarians. Demonstrated the library article search with basic keyword searching, and how to use search filters effectively.



Libraries
MICHIGAN STATE UNIVERSITY

PEER RESEARCH ASSISTANTS



Make an appointment, location & hours:

libguides.lib.msu.edu/engage

Additional ways to get help with research!