

WATER: A
website about
our precious
resource

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Comet 1P/Halley

W. Liller/NASA

Mar. 8, 1986

Wikipedia Halley's Comet,

https://en.wikipedia.org/wiki/Halley%27s_Comet#/media/File:Lspn_comet_halley.jpg

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Proposal addressed

1. Why is water an important subject for science journalism?
2. What is the role of a science journalist?
3. What are the relationships between science journalists and scientists?
4. What are the relationships between science journalists as teachers and science literacy?
5. How and why should science journalists educate the public about water-related issues?
6. Why is a website an appropriate medium for educating the public about water?
7. What education and experience do I have that qualify me to educate the public about water?

1. Water matters

- Water covers about 70% of Earth's surface
- Most versatile substance on our planet
- Necessary for life, health, agriculture, medicine, recreation and hydroelectric energy production used by millions
- Many places on the planet do not have clear, clean drinking water
- Factors explaining too little and too much water are complicated
- Too little or too much results in disease, death and environmental catastrophe



Blue Marble, H. Schmitt and R. Evans
Apollo 17, NASA
Dec. 7, 1972
Wikipedia Earth,
https://en.wikipedia.org/wiki/Earth#/media/File:The_Earth_seen_from_Apollo_17.jpg
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2. Science journalism

Science editor Rehab Abdalmohsen summarized the role of a science journalist:

When confronted by apparently impenetrable specialist terminology and concepts, it is a science journalist's job to act as the point of contact between researchers and the public. Like a pearl diver, you have to be able to pick out phrases that will resonate with the audience – phrases that contain a lot of scientific detail and meaning, that will have a real effect on the public's awareness and behaviour. For a science journalist to play this role, they need enough specialist knowledge to understand and discuss the research (Shehab, 2022)

2. Water and science journalism skills

- Science journalists have a special obligation to educate the public about water competition, threats and solutions
- A science journalist needs specialized subject knowledge to decide what and how to present scientific information to a non-expert audience (Shehab, 2022)
- Investigating water issues requires a fundamental grasp of engineering, economics, meteorology and agriculture (Leavenworth, 2005)



Verde River upstream of Clarkdale, Arizona
Finetooth
Mar. 10, 2013
Wikipedia Verde River
https://en.wikipedia.org/wiki/Verde_River#/media/File:Verde_River_near_Clarkdale,_Arizona.jpg
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2. Monitorial and facilitative roles of science journalists



Watermelon snow on Mount Ritter in California
Pacific Southwest Forest Service/P. Wade
Aug. 29, 2017
Wikipedia watermelon snow
[https://en.wikipedia.org/wiki/Watermelon_snow#/media/
File:170828-FS-Inyo-PRW-001-
MountRitter_\(36217539154\).jpg](https://en.wikipedia.org/wiki/Watermelon_snow#/media/File:170828-FS-Inyo-PRW-001-MountRitter_(36217539154).jpg)
public domain

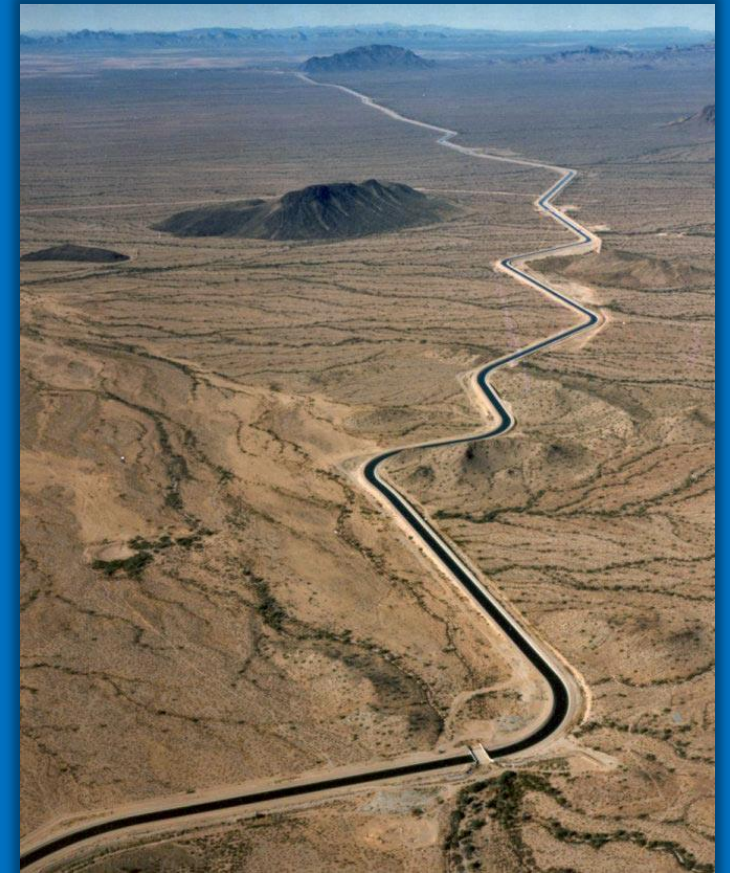
- The monitorial role involves collecting, publishing and distributing scientific information of interest to the public and providing commentary, advice and warning (Christians et al., 2009; Hanitzsch, 2017)
- The facilitative role encourages dialog between stakeholders and sparks public participation in political life, where “the news media do not merely report on civil society’s associations and activities but support and strengthen them” (Christians et al., 2009)

3. Science journalists and scientists

- Evaluate the results of older scientific studies, weigh them against new scientific information, federal, state and local regulations and the credibility of scientific sources
- In 1945, Grand Rapids, Michigan, began adding fluoride to its water system (Centers for Disease Control and Prevention, 2021). Within a few years, many cities in the U.S. began adding fluoride to their water
- Despite endorsements by the American Dental Association and the American Academy of Pediatrics, scientific articles are still available on the internet leading the public to believe that fluoridated water is dangerous. One source includes 50 reasons not to allow fluoridation and was written in 2012 (Connell, 2012)

3. Science journalists and scientists

- Decide how to present and refute misinformation, especially when it creates fear and anxiety
- COVID-19 disinformation
- Science journalists can explain why some sources, findings and studies lack credibility (Water Resources Research Center, 2010)
- Teach the public to be informed critical thinkers rather than passive news consumers



Central Arizona Project canal
Central Arizona Project
Mar. 26, 2008
Wikipedia Central Arizona Project
https://en.wikipedia.org/wiki/Central_Arizona_Project#/media/File:Arizona_cap_canal.jpg
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3. Science journalists and scientists

- **Monitor scientific institutions and keep them accountable (Bottesini et al., 2022)**
- **Predatory journals, unchecked research results, studies sponsored by corporations with economic interests and unpublicized paper retractions pose an additional challenge, requiring journalistic diligence and time to separate credible science from disinformation (Bucci, 2019)**
- **Promote good science and discourage publication of bad science**
- **When the findings of a scientific paper with a limited academic audience are reinterpreted and rewritten by a science journalist, they may reach thousands or millions rather than a small group of scientists within the field (Water Resources Research Center, 2010)**

4. Science journalists as teachers and science literacy



Curb-adjacent stormwater collection basin
5500 block of East Alta Vista
Green Stormwater Infrastructure Grant Project
D. Meeks
Oct. 26, 2021
Image taken by and used with permission of the
author
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- **Overcome public misperceptions, make water stories interesting and comprehensible, keep the public's attention (Davies, 2013; Leavenworth, 2005)**
- **Identify valid and reliable information for public consumption, and refute unsubstantiated rumors, bad science and dubious technology (Polman et al., 2014)**
- **Explain that not all scientific claims have equal standing and weight, and explain how and why scientific knowledge evolves**

4. Science journalists as teachers and science literacy

- **Facilitate public conversations, build consensus, expose health and safety issues, inspire individuals to work together to solve problems**
- **Roth and Lee studied the Henderson Creek watershed in Oceanside in the Pacific Northwest, where there was a water shortage due in part to industrial pollution from a gas station. Because citizens studied the issue, they were able to refute disinformation provided by so-called experts with ulterior political motives (Roth & Lee, 2002)**

4. Science journalists as teachers and science literacy

- Large gap to be filled by science journalists
- “Science education can help people solve personally meaningful problems in their lives, directly affect their material and social circumstances, shape their behavior, and inform their most significant practical and political decisions” (Feinstein, 2010)
- Involves practical, daily health, work and family-related issues (Feinstein, 2010), farming practices, reasons to protest (Roth & Lee, 2002), childhood vaccination decisions, food consumption choices, water safety evaluation



Downstream end of the chlorine contact chamber
at Agua Nueva, Pima County Wastewater
James Brown
May 15, 2020
Image and caption used with permission

5. Science journalists representing science in media

- **Media outlets only focus on water when there is too much or too little (Rita Schmidt Sudman, Water Education Foundation, quoted in Leavenworth, 2005)**



Eutrophication in Mono Lake, California

NASA

Oct. 22, 2006

Wikipedia Eutrophication

https://en.wikipedia.org/wiki/Eutrophication#/media/File:Wfm_mono_lake_landsat.jpg

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5. Editorial limitations of water-related media

- **Local, state, national and global water stories focus on different geographic, meteorological, technological, environmental, sociological and political aspects of water, slanted to support specific data, political and economic situations**
- **They sometimes leave out critical connections among weather events, environmental damage, community impacts and laws and regulations affecting water use and safety**
- **Editorial and timing considerations may prevent news media from adequately making connections that would place water issues in the best context for public understanding**

5. Editorial limitations of water-related media

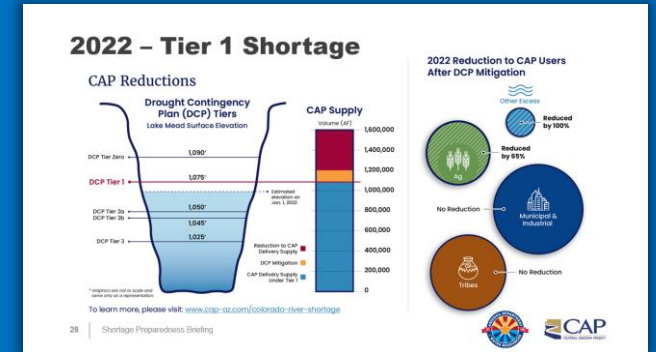
- “This leaves media that produces short articles for broad target audiences stuck in terms of what it can say about scientific progress. Its current format doesn’t give it much room to move, and as a result, the fragments of its audience who are interested in science are finding information about it elsewhere” (Davies, 2013).
- Science journalists, who lack the time or experience to research their own stories, sometimes use press releases created by university news offices, government research agencies and corporations (Russell, 2008)



Glen Canyon Dam, substation and bridge near Page, Arizona
Adbar
Mar. 1, 2010
Wikipedia Glen Canyon Dam
https://en.wikipedia.org/wiki/Glen_Canyon_Dam#/media/File:Glen_Canyon_Dam_and_Bridge.JPG
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5. Limited connections in media water stories

- August 2021, U.S. Bureau of Reclamation declared a Tier 1 Colorado River shortage and on August 16, announced a Tier 2 shortage as of January 2023 (Nilsen & Ramirez, 2022)
- KGUN-TV reported Arizona's Colorado River supply cut would affect agriculture, ignoring effects on city and Tribal water supplies (Simmons, 2022). KVOA-TV declared online and at 5 p.m. that "Tucson could be an oasis in the desert" (Jackson, 2021)
- These stories failed to connect the declared shortages with the 20-year drought in the Western U.S., water conservation efforts and Colorado River shortages as a symptom of potential global shortages



Tier 1 shortage
Central Arizona Project
2022
Water/CAP System/Planning and
Processes/Shortage Impacts
<https://www.cap-az.com/water/cap-system/planning-and-processes/shortage-impacts/>
Used with written permission of
Central Arizona Project

6. How to educate the public: *WATER, the website*

- Include water topics that interest the public and science journalists - menus
- Describe scientific concepts clearly and succinctly – user-activated definitions, summary tables
- Reduce editorial limitations and problems – “unlimited” webspace
- Provide up-to-date information – easily modified
- Incorporate interactive features – embedded videos, image swapping

6. *WATER* limitations and features

- Not intended to teach journalists how to think, communicate or write like science journalists
- Not intended as a replacement for thorough science research, understanding the scientific method or study results
- Does not tell extensive stories
- Not a research paper or article
- Uses hundreds of articles, reports, documents, laws, regulations, newsletters, videos, static and interactive maps, charts, graphs and images
- Clickable endnotes and references
- Sortable data tables
- Dozens of embedded videos, sounds and trivia questions
- In-text definitions
- Acronyms & Abbreviations list and Glossary
- More than 10,000 lines of HTML, JavaScript and CSS code

6. *WATER* Site Notes and sources

- History
- Research
- Navigation
- Credits
- Permissions
- Author works
- Federal, state and local regulations
- Supreme Court decisions
- The Law of the River
- Central Arizona Project College
- More than 300 other sources

7. Author qualifications

- BS, Astronomy & Physics, 1981, U of A
- MS, Systems Engineering, 1989, U of A
- Ed D, Math Curriculum & Instruction, 1997, NAU
- MS, Geosciences, Mississippi State, 2006
- MS, Space Studies, U of North Dakota, 2014



- 27 years teaching college astronomy, physics, and math
- 10 years organizing, running, and participating in community STEM events
- Completed JOUR 555, JOUR 565 and EWRS 596B
- Member, U of A Water Whys team

For future science journalism students

- Pick a topic you can live with
- Determine preliminary topics, goals and objectives
- Think and communicate as a scientist and a teacher
- Research and verify using many credible sources
- Summarize with appropriate terminology
- Utilize sound website design practices, including colors, contrast and navigation
- Cite all sources
- Obtain written permissions
- Keep the website up-to-date
- Include contact information
- Make it fun!

Thanks to

Dr. Susan Swanberg, for teaching me to write as a science journalist, JOUR 555 and JOUR 565

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Questions?

Let's play!

<http://denisemeeks.com/water/>