SCIENCEBITE
COMPLETE GUIDE

Dr. Brian Lower, PhD

The Ohio State University

SCIENCEBITE GUIDE:

PICKING A TOPIC

Brian H. Lower, PhD
The Ohio State University

SCIENCEBITE ASSIGNMENT LEARNING OBJECTIVES

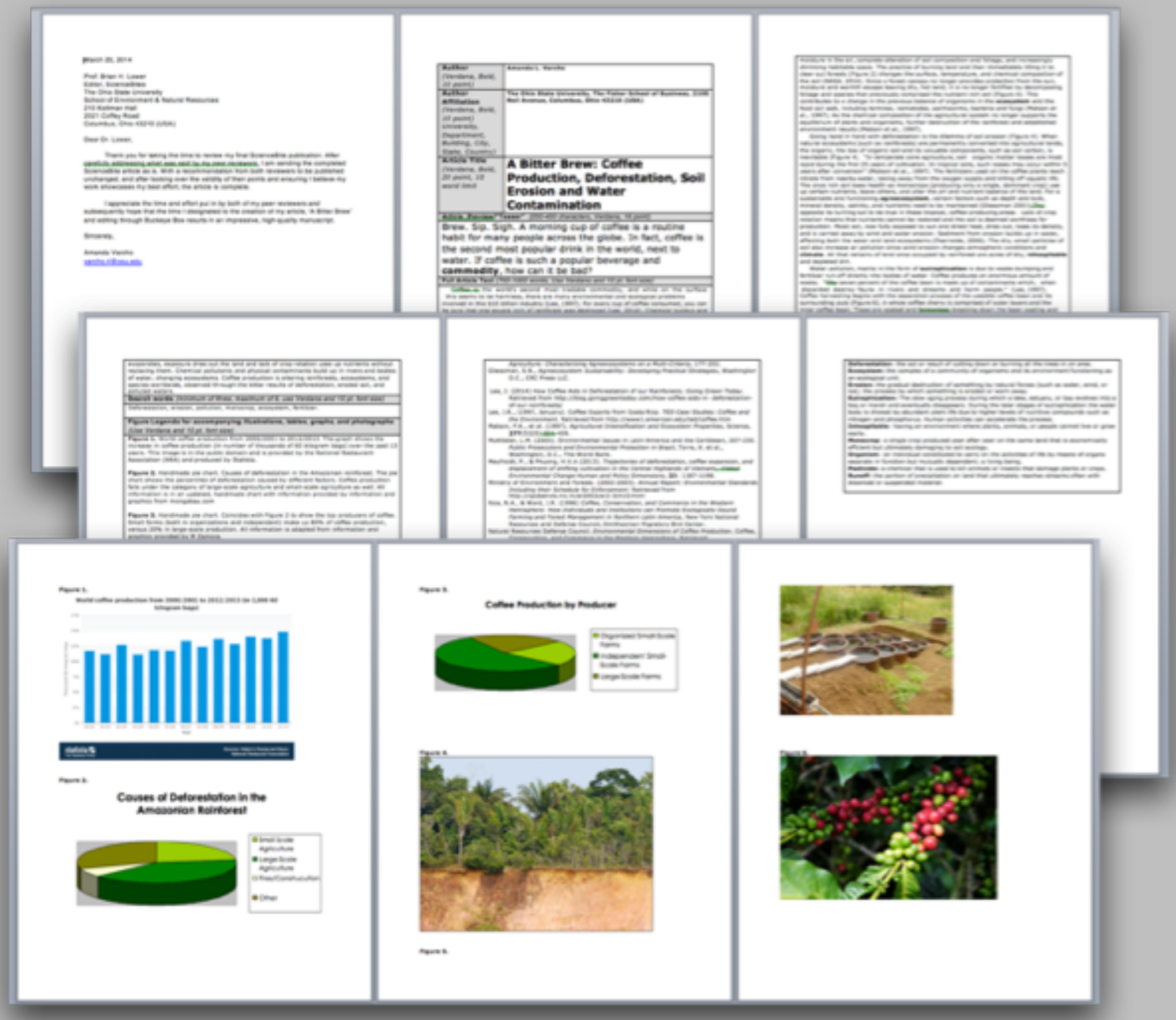
- Students learn how to find information and critically evaluate a topic, issues, results and conclusions.

- Students learn how scientific research is conducted and how results and conclusions are reported to the public so that people can make more informed decisions in their own lives.

- Students learn that the peer-review evaluation system is an integral part of the scientific process that enables scientists to maintain high standards of quality and provides credibility to research and scholarly works.

- Peer reviews teach students how to become better writers and speakers by focusing their attention on particular details and considering the input of an actual audience.

A ScienceBite is a short format article that presents one specific topic, in the field of environmental science. The article includes 4 to 6 figures (illustrations, graphs, tables, photographs, etc.) that are of high quality and that assist in describing the topic. The article contains both primary and secondary sources and is written for an audience of university students, faculty, and professionals. This assignment is designed to enhance your understanding of key concepts and develop your scientific literacy about a topic that you select.



Approximately 25 different ScienceBites can be viewed in the Environmental ScienceBites and Environmental ScienceBites Volume 2, published by Apple in 2015 and 2018.

These articles are all written by previous ENR 2100 students. These books are FREE and available for download. Get a feel for how to design figures and tables, how best to present your topic and how high-resolution photographs can be used to tell your story.

[Volume 1: View and Download]

[Volume 2: View and Download]

FOR FULL INSTRUCTIONS DOWNLOAD “ScienceBite Complete Guide” from Carmen

SCIENCEBITE TIMELINE

Week 1-3: Pick a Topic, find 10 references (6 need to be primary sources) and write abstract on Carmen.

Week **9-10:** Complete peer reviews of 2-3 manuscripts on Carmen.

Week 4-8: Write the first draft of your ScienceBite and submit to Carmen. Dr. Lower will assign 2-3 ScienceBites to review per student.

Week **11-12**: Write revised manuscript addressing the reviewers' concerns and submit final draft to Carmen.

HOW TO PICK YOUR TOPIC

1. It has to deal with environmental science on Earth, although other planets **MAY** be acceptable (you should ask Dr. Lower if you are thinking about writing an article about somewhere besides Earth).

2. It has to be **FOCUSED** and NOT be a general overview of a topic.

3. It should be of interest to you and something that you want to learn more about.

4. Use a book, journal, website, magazine, documentary, etc. to find a topic that is interesting to you. Good sources of information can be found on **Twitter @OSUEnViRo** - click on our **Tweets** or look at who we are **Following**.

FOCUSED SCIENCEBITE = EXCELLENT GRADE

GENERAL SCIENCEBITE = POOR GRADE

ScienceBite articles should be FOCUSED and NOT a general overview of a topic.

They should include:

1. Environmental issue/problem/area of focus
2. Species of focus
3. A specific geographic location

For example:

Wind Turbine Use Threatens San Francisco Bay Golden Eagle Population

Environmental Issue — **Specific geographic location** — **Species of focus**

FOCUSED TOPIC vs GENERAL TOPIC

EXCELLENT

1. Decreased Arctic sea ice causing changes in the diets of Polar Bear living in the North Slope of Alaska

2. Poly aromatic hydrocarbons (PAHs) released from roofing tar linked to lung cancer in children in Beijing.

3. Synthetic organic compounds used to clean coal in Appalachia bioaccumulate in river trout.

4. Solar lithium-ion microgrid systems provide shared electricity among rural areas in western USA.

VERY BAD

1. Climate change is affecting the Arctic.

2. Air pollution in Beijing is caused by cars and is bad for human health.

3. Burning coal leads to water pollution in Ohio.

4. Solar Power will save Earth.

SOME GOOD PLACES TO START

SECONDARY SOURCES

1. New York Times http://www.nytimes.com
2. National Geographic http://www.nationalgeographic.com
3. Our textbook or any other Earth or Life Science textbook
4. Any of the people that **@OSUEnViRo** is **Following** on Twitter
5. National Public Radio http://npr.org
6. PBS Nature http://www.pbs.org/wnet/nature/
7. PBS NOVA http://www.pbs.org/wgbh/nova/
8. PBS FRONTLINE http://www.pbs.org/wgbh/frontline/
9. Scientific American http://www.scientificamerican.com
10. Washington Post https://www.washingtonpost.com

PRIMARY SOURCES

11. Science http://www.sciencemag.org
12. Nature http://www.nature.com
13. PNAS http://www.pnas.org

FOLLOW **@OSUEnViRo** FOR HIGHLY RESPECTED SOURCES

SOME U.S. GOVERNMENT WEBSITES THAT ARE EXCELLENT **SECONDARY SOURCES**

SECONDARY SOURCES

1. Centers for Disease Control and Prevention (CDC) http://www.cdc.gov
2. National Aeronautics and Space Administration (NASA) https://www.nasa.gov
3. National Institutes of Health (NIH) http://www.nih.gov
4. National Oceanic and Atmospheric Administration (NOAA) http://www.noaa.gov
5. National Park Service (NPS) http://www.nps.gov
6. Department of Agriculture (USDA) http://www.usda.gov
7. Department of Energy (DOE) http://www.energy.gov
8. Department of Interior (DOI) https://www.doi.gov
9. Environmental Protection Agency (EPA) http://www.epa.gov
10. Fish and Wildlife Service (FWS) http://www.fws.gov
11. Food and Drug Administration (FDA) http://www.fda.gov
12. Geological Survey (USGS) http://www.usgs.gov
13. National Science Foundation (NSF) http://www.nsf.gov

When selecting your ScienceBite topic, try reviewing articles and publications from SECONDARY SOURCES first. These sources and information will be easier to understand and faster to read. Once you find an article that you are interested in, then you can begin locating PRIMARY SOURCES. Primary sources will have more specific information and can help you narrow down your topic further.

If you have questions about locating a topic, narrowing your topic, or any other ScienceBite information you should visit with a teaching assistant at their office hours or email OSUEnvironment@gmail.com.

SCIENCEBITE GUIDE:

FINDING SOURCES

Brian H. Lower, PhD
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LOCATING SOURCES FOR YOUR SCIENCEBITE

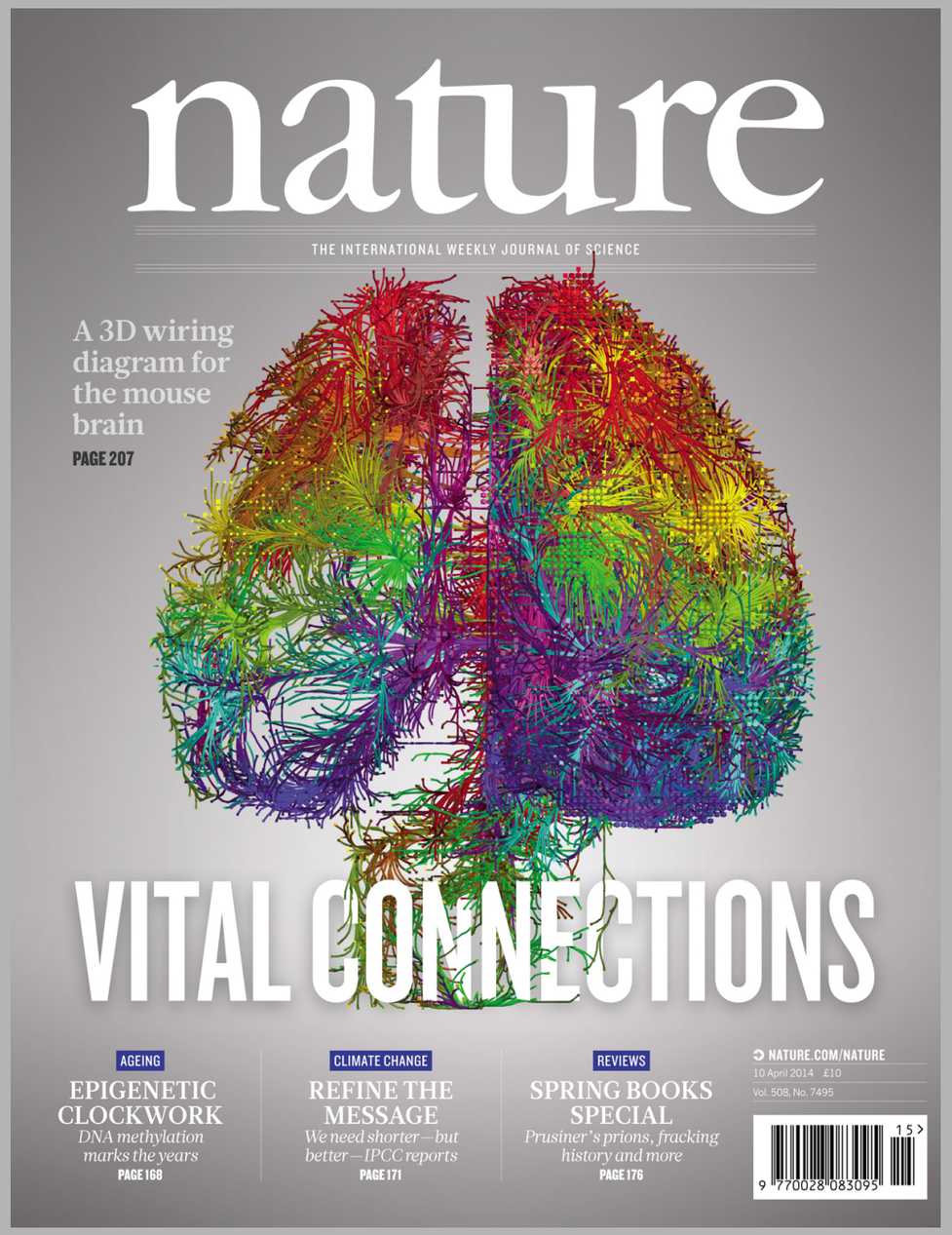
Your ScienceBite should contain a MINIMUM of 10 references.

- **6** references should be from a PRIMARY source
- **4** references can be from either a PRIMARY source or SECONDARY source
- **0** references can be from a TERTIARY source

References *(Use Arial and 10 pt. font size)*

1. Strain, D. (2012, March 16). Climate Change Sends Beetles Into Overdrive. *Science.* Retrieved from http://www.sciencemag.org/news/2012/03/climate-change-sends-beetles-overdrive
2. Muzzin, M. (2011). *Dendroctonus ponderosae.* Animal Diversity Web. Retrieved from http://animaldiversity.org/accounts/Dendroctonus_ponderosae/
3. National Park Service. (2015, April 24). *Mountain Pine Beetle.* Retrieved from https://www.nps.gov/romo/learn/nature/mtn_pine_beetle_background.htm
4. Pelz, K., Cheng, T. (2015, October). Mountain Pine Beetle. *Colorado Encyclopedia.* Retrieved from https://coloradoencyclopedia.org/article/mountain-pine-beetle
5. Cooke, B.J., & Carroll, A.L. (2017 July 15). *Forest Ecology and Management*, **396**:11-25. https://doi.org/10.1016/j.foreco.2017.04.008
6. Rosenberger, D.W., et al. (2017 September). *Forest Ecology and Management*, **400**:28-37. https://doi.org/10.1016/j.foreco.2017.05.031
7. Bentz, B., et al. (2016). *Forestry: An International Journal of Forest Research*, **89**(3):271-283. https://doi.org/10.1093/forestry/cpv054
8. Schoennagel, T., et al. (2012). *PLOS ONE*, **7**(1): e30002. https://doi.org/10.1371/journal.pone.0030002
9. Mitton, J.B., Ferrenburg, S.M. (2012). *The American Naturalist*, **179**(5): E163-E171. https://doi.org/10.1086/665007
10. Bearup, L.A., et al. (2014). *Nature Climate Change*, **4**(6): 481-486

PRIMARY SOURCES



Peer reviewed journal article

At least 6 references **MUST** be from a **PRIMARY SOURCE**, which means they have to be a **JOURNAL ARTICLE.** Primary sources, such as journal articles, are peer reviewed prior to publication and only after they have passed this process can they be published. And so their content can be trusted because it has went through a rigorous review process. Many high-impact journals are so selective in what they publish, that they will reject greater than 90% of all the manuscripts that are sent to them for publication.

Primary sources are journal articles that have been written by professors, scientists and engineers and submitted to a journal for publication. These professionals are the original source of the information being discussed in the article. The editors working at the journal take the manuscript (it's not referred to as an article until after its published) and send it out for review to usually 3-5 experts in that particular field of research. These experts take 2-5 weeks to review the article and tell the editors if the manuscript is acceptable for publication in their journal. These experts are often very critical of the manuscript and the research that is presented in the manuscript. As a result, they will tell the editor NOT to accept the manuscript for publication and reject the manuscript. If this happens then the manuscript is sent back to the authors and they have to conduct more research and then submit their manuscript back to the same or another journal for the peer review process to start all over again.

High impact journals like Science and Nature set very high bars of success and will reject great than 95% of all manuscripts that they receive due to poor reviews. Typically, the better the journal the higher the rejection rate.

SOME EXCELLENT EXAMPLES OF VERY WELL RESPECTED **PRIMARY SOURCES**

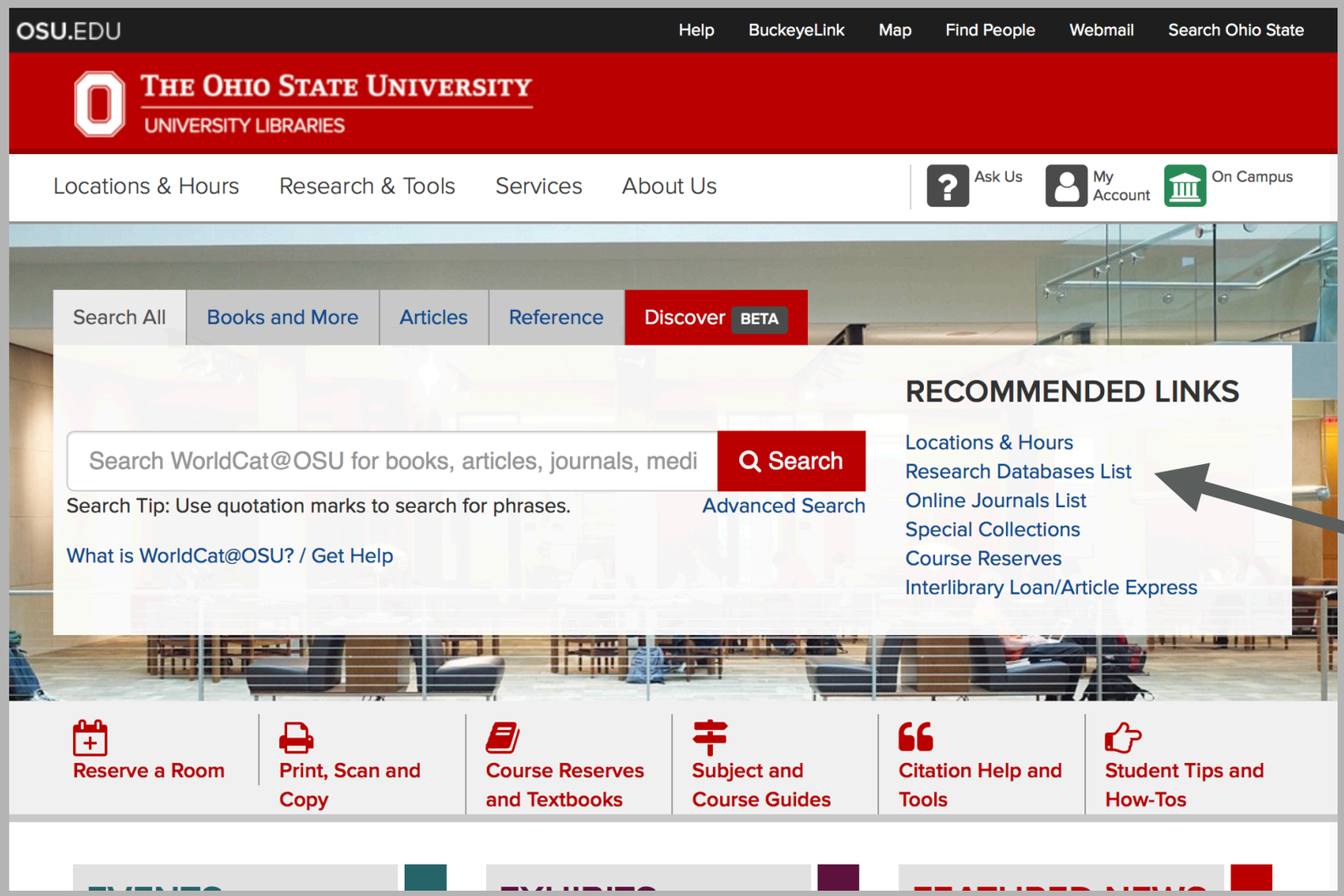
PRIMARY SOURCES

1. Science http://www.sciencemag.org
2. Nature http://www.nature.com
3. PNAS http://www.pnas.org
4. Many of the people that **@OSUEnViRo** is **Following** on Twitter

There are literally thousands of different journals that publish hundreds of individual articles each year. Scientists have been publishing articles in journals for hundreds of years. This works out to **tens of millions of published articles** contained within all these journals. Therefore, the very BEST way to find articles that are of interest to you is to use a computer and a search engine, such as Web of Science.

HOW TO FIND JOURNAL ARTICLES

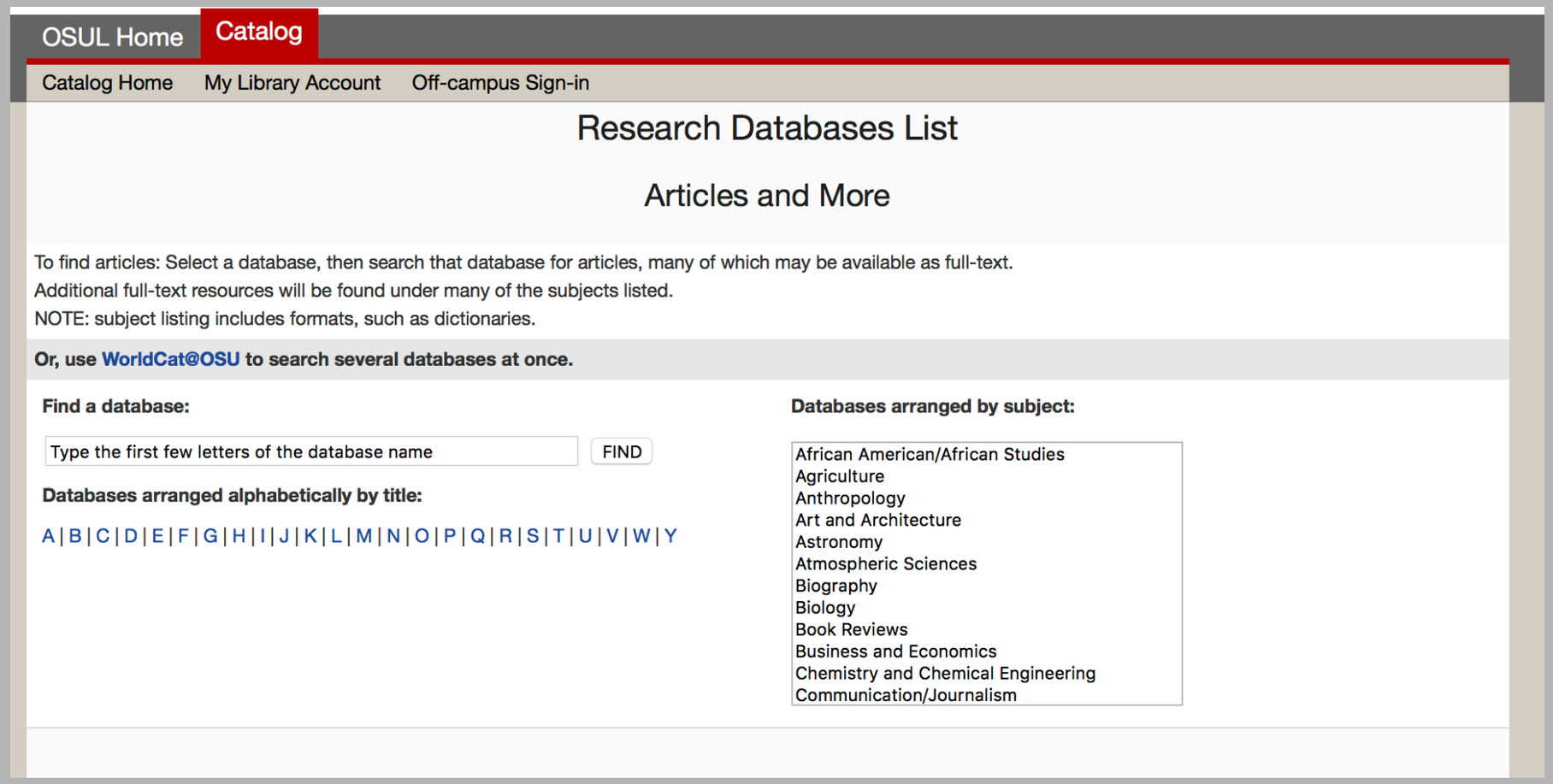
For your ScienceBite article, we recommend using the research database search engines from the OSU library to locate FREE primary source journal articles. These search engines allow you to search through millions of published articles to find those related to your topic. Two of the most popular search engines that scientists use are Web of Science and PubMed.



Visit https://library.osu.edu

Click the “Research Databases List” on the right hand side of the page.

WEB OF SCIENCE



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- Hot Papers in Field (1)
- Open Access (217)
- Associated Data (7)

Refine

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Page 1 of 112

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Analyze Results

1. **Initial data on adsorption of Cs and Sr to the surfaces of microplastics with biofilm**

By: Johansen, Mathew P.; Prentice, Emily; Cresswell, Tom; et al.
JOURNAL OF ENVIRONMENTAL RADIOACTIVITY Volume: 190 Pages: 130-133 Published: OCT 2018

Find It! View Abstract

Times Cited: 0
(from Web of Science Core Collection)

Usage Count

2. **The impact of nanoplastics on marine dissolved organic matter assembly**

By: Chen, Chi-Shuo; Le, Clarence; Chiu, Meng-Hsuen; et al.
SCIENCE OF THE TOTAL ENVIRONMENT Volume: 634 Pages: 316-320 Published: SEP 1 2018

Find It! View Abstract

Times Cited: 0
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SECONDARY SOURCES

"All the News That's Fit to Print"

The New York Times

Late Edition

Today, clouds and sunshine, high 58. **Tonight,** cloudy, a brief shower late, low 53. **Tomorrow,** morning clouds, some afternoon sun, high 64. Weather map is on Page C8.

VOL. CLXV . . . No. 57,029 + © 2015 The New York Times NEW YORK, SATURDAY, OCTOBER 24, 2015 $2.50

HURRICANE SLAMS COAST OF MEXICO WITH HIGH FORCE

BRINGS 165-M.P.H. WINDS

Storm Barrels Inland — Extensive Damage and Flooding

This article is by ***Elisabeth Malkin, Azam Ahmed*** *and* ***Frances Robles.***

MEXICO CITY — The strongest hurricane ever known to assault the Western Hemisphere slammed into Mexico's southwest Pacific Coast on Friday, transforming hotels into makeshift shelters, shuttering schools, closing airports and sending inhabitants racing to bus stations to flee inland.

The storm, named Hurricane Patricia, packed winds of about 165 miles per hour as it struck land, having slowed considerably from earlier speeds of about 200 miles per hour as it spun toward a coastline dotted with tiny fishing villages and five-star resorts in cities like Puerto Vallarta.

As the outer wall of the hurricane swept over the coast in the afternoon, trees were quickly flattened, landslides tumbled along a major road, light poles were toppled and roofs flew off.

"You had to feel how the air trembled," said Yael Barragan, a trucking service coordinator in the port city of Manzanillo, huddled in his home with five children and four other adults. When the wind started blowing, it was not long before a neighbor's roof was in his backyard. "I saw it fly, and I saw it land in my patio," he said.

Less than an hour after landfall, the National Hurricane Center said the storm was barreling

Continued on Page A11

MAURICIO LIMA FOR THE NEW YORK TIMES

A member of the Majid family, Roujin Sheikho, center, rested with her daughter and other kin in a Serbian field in late August.

A Syrian Family Swept Up in a Migrant Tide to Europe

Many Obstacles Await on Perilous Quest for Safe Haven

By ANEMONA HARTOCOLLIS

Zain al-Abideen Majid's father lifts him over a coil of glittering razor wire in the moonlit darkness of a Serbian farm, stretching to hand the boy to a relative on the other side.

Though Zain is only 4, this is by no means his first surreptitious border crossing, and he remembers his father's admonition at the very start of their journey, when they slipped from their homeland of Syria into Turkey: Don't make a sound, or the guards will beat us.

On this night, as Zain is passed over the wire from Serbia into Hungary, the barbs rip two bloody gashes in his right shin.

He stays silent.

Zain was born in Syria as the fighting there was beginning. Ever since, he and his extended family have been living in the shadow of conflict, surrounded by a chaotic mix of fear, threats, extortion and kidnapping.

This summer, Zain, his father, Ahmad Majid, and a band of determined relatives — eight adults, including Zain's pregnant mother, and five other children, a baby and a toddler among them — became part of a remarkable chapter in human migration.

Over nearly two months, the family journeyed from Syria through Turkey and eight European countries, through much of the trip not even sure of a destination. The group was cheered and cursed, encountering the best of Europe, and the worst. They endured exhaustion and despair, stranded for five days in a train station in Budapest and imprisoned in Denmark with seemingly no hope of moving forward. And they had moments of triumph, outwitting border guards and benefiting from the camaraderie of fellow travelers.

"It's better than dying," says Ahmad.

The sheer number of people trudging alongside them has often led to impersonal descriptions: a wave, a mass, a crisis. But up close they were very much individuals living through an unsettling and sometimes terrifying journey. For the Majids, that journey took them from the olive groves of the village in Syria that had nurtured their family for generations toward an uncertain future in an alien culture.

For much of the trip, I traveled with them, along with a team of other journalists from The New York Times, documenting their joys and sorrows, and sometimes becoming part of their experience.

The Majids are a tight-knit family, resourceful and relatively well off. For years, Ahmad cautiously plotted how best to survive in Syria, even as it was deteriorating and splintering into fiefs run by rival warlords and militias. Prosperous and with

Continued on Page A8

F.B.I. CHIEF LINKS EYES ON POLICE TO RISE IN CRIME

AN UNSETTLED THEORY

Sharp Dispute Over Any Credence to the 'Ferguson Effect'

By MICHAEL S. SCHMIDT and MATT APUZZO

CHICAGO — The F.B.I. director, James B. Comey, said on Friday that the additional scrutiny and criticism of police officers in the wake of highly publicized episodes of police brutality may have led to an increase in violent crime in some cities as officers have become less aggressive.

With his remarks, Mr. Comey lent the prestige of the F.B.I., the nation's most prominent law enforcement agency, to a theory that is far from settled: that the increased attention on the police has made officers less aggressive and emboldened criminals. But he acknowledged that there is so far no data to back up his assertion and that it may be just one of many factors that are contributing to the rise in crime, like cheaper drugs and an increase in criminals who are being released from prison.

"I don't know whether that explains it entirely, but I do have a strong sense that some part of the explanation is a chill wind that has blown through American law enforcement over the last year," Mr. Comey said in a speech at the University of Chicago Law School.

Mr. Comey's remarks caught officials by surprise at the Justice Department, where his views are not shared at the top levels. Holding the police accountable for civil rights violations has been a top priority at the department in recent years, and some senior officials do not believe that scrutiny of police officers has led to an increase in crime. While the department had no immediate comment on Friday, several officials privately fumed at Mr. Comey's suggestion.

Among the nation's law enforcement officials, there is sharp disagreement over whether there is any credence to the so-called Ferguson effect, which refers to

Continued on Page A3

3 Directors Say VW Hid Deceit From the Board

By JACK EWING and JAD MOUAWAD

At least three members of Volkswagen's board said they were left in the dark about the company's emissions cheating for two weeks after top executives admitted the deception to American environmental officials.

During that period, the board was completing the terms of a contract extension for the automaker's chief executive, Martin Winterkorn. He was pushed out five days after the use of the cheating device became public, though he insisted he had known nothing about it.

The board members' statements shed new light on flaws in the management structure and lines of communication at Volkswagen, the world's largest automaker. Volkswagen's stock has lost about a third of its value since Sept. 18, when the cheating was made public by the United States Environmental Protection

RICHARD PERRY/THE NEW YORK TIMES

Sotheby's Pulls Out All the Stops

The auction house is feverishly promoting its sale of the art of its ex-chairman, A. Alfred Taubman, who was jailed for price-fixing. One lot to be sold is Modigliani's "Paulette Jourdain." Page C1.

Right-Wing PACs Vilify G.O.P. Elite, and It Pays

By ERIC LIPTON and JENNIFER STEINHAUER

WASHINGTON — The peti-

Congress more conservative, a fevered continuation of the six-year Tea Party movement.

But these politically charged

day after he said he was willing to serve as House speaker.

Even some members of Congress who might benefit from the

Bush Cuts Costs, Carson Eclipses Trump in Iowa and G.O.P. Frets

By PATRICK HEALY and TRIP GABRIEL

A beleaguered Jeb Bush slashed his campaign spending. Donald J. Trump lost his lead in Iowa. And a surging Ben Carson galvanized his support among social conservatives.

With Hillary Rodham Clinton emerging as the unrivaled leader in the Democratic contest, the unruly Republican presidential field suddenly seemed to lack a center of political gravity on Friday, leaving party strategists and voters to fear a long nomination fight that could end with a damaged standard-bearer facing a more unified left.

Mr. Bush cut salaries, fired consultants and laid off or re-

will act to reverse his sagging poll numbers. And Mr. Carson, whose fund-raising has roughly kept pace with his climb in the polls, is moving to run television commercials in Iowa, New Hampshire and South Carolina, positioning himself to influence the outcomes in those states and others if he manages to continue lock-

Jeb Bush

The remaining 4 references can be **SECONDARY SOURCES**, which generally means newspapers, radio programs, news programs, documentaries, videos, magazines. These sources have generally NOT been peer reviewed, however, some have been reviewed by an editor(s) prior to publication because they want to maintain a high degree of integrity in their company and publication.

Editor reviewed newspaper article.

Secondary sources have NOT been peer reviewed. But this does NOT mean that they are bad sources of information. Some secondary sources are very well respected and excellent sources of information. These articles (or audio- or video-recordings) are used to provide information that has originally been presented elsewhere (for example, in a journal article, in a seminar at a professional conference). These articles are often reviewed by an editor or editors prior to publication to ensure the quality of writing and the integrity of the story. Just as is the case for journals, a strong reputation is what these publishers are striving for. Those that have developed a trust with the general public because they have a strong reputation for unbiased reporting are generally well respected as sources of trustworthy information. **SECONDARY SOURCES ARE USUALLY EASIER TO READ AND UNDERSTAND THAN PRIMARY SOURCES.**

Highly respected newspapers like The New York Times, the Wall Street Journal and the Washington Post have an extensive editorial staff and professional writers to ensure high quality articles. Textbooks, such as the one we use for our class, are also excellent secondary sources.

SOME EXCELLENT EXAMPLES OF VERY WELL RESPECTED **SECONDARY SOURCES**

SECONDARY SOURCES

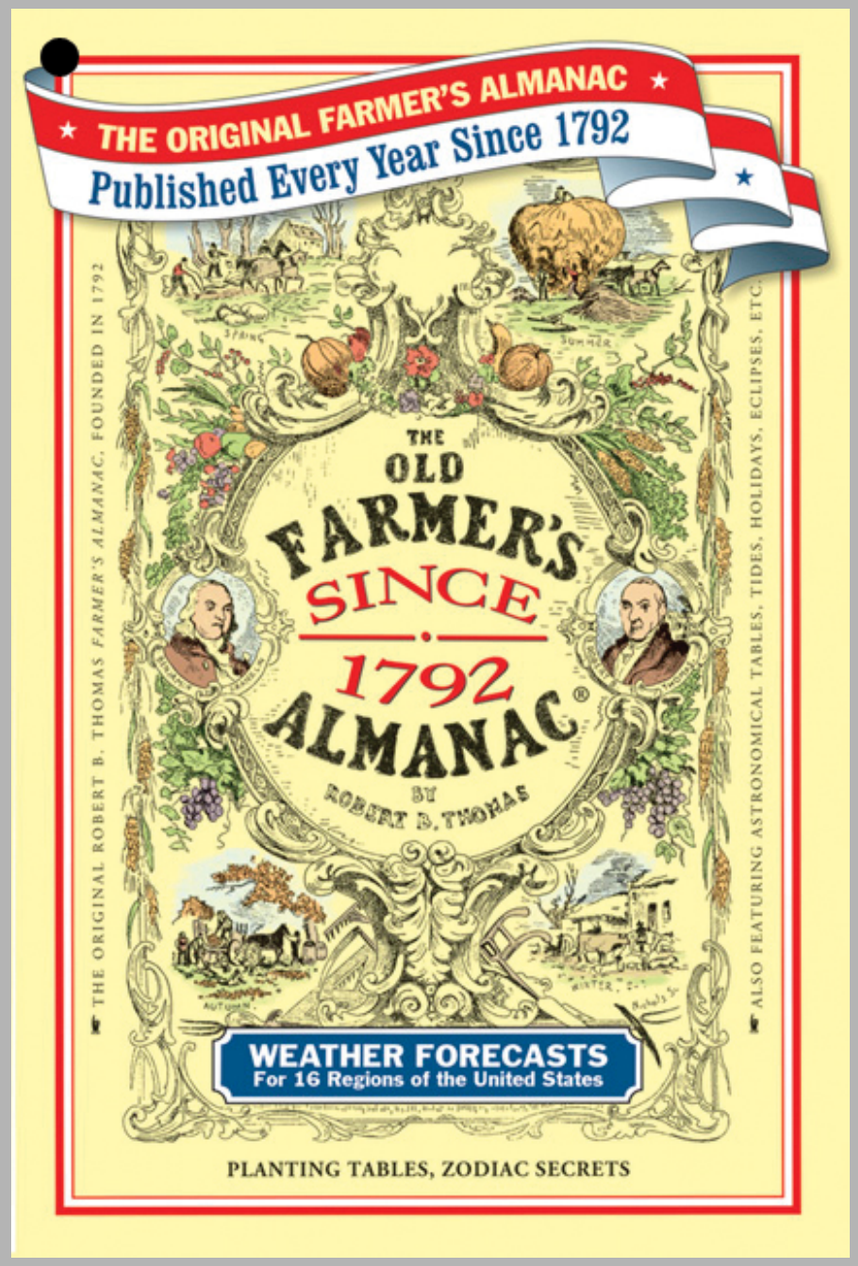
1. New York Times http://www.nytimes.com
2. National Geographic http://www.nationalgeographic.com
3. Our textbook or any other Earth or Life Science textbook
4. Many of the people that **@OSUEnViRo** is **Following** on Twitter
5. National Public Radio http://npr.org
6. PBS Nature http://www.pbs.org/wnet/nature/
7. PBS NOVA http://www.pbs.org/wgbh/nova/
8. PBS FRONTLINE http://www.pbs.org/wgbh/frontline/
9. Scientific American http://www.scientificamerican.com
10. Washington Post https://www.washingtonpost.com

SOME U.S. GOVERNMENT WEBSITES THAT ARE EXCELLENT **SECONDARY SOURCES**

SECONDARY SOURCES

1. Centers for Disease Control and Prevention (CDC) http://www.cdc.gov
2. National Aeronautics and Space Administration (NASA) https://www.nasa.gov
3. National Institutes of Health (NIH) http://www.nih.gov
4. National Oceanic and Atmospheric Administration (NOAA) http://www.noaa.gov
5. National Park Service (NPS) http://www.nps.gov
6. Department of Agriculture (USDA) http://www.usda.gov
7. Department of Energy (DOE) http://www.energy.gov
8. Department of Interior (DOI) https://www.doi.gov
9. Environmental Protection Agency (EPA) http://www.epa.gov
10. Fish and Wildlife Service (FWS) http://www.fws.gov
11. Food and Drug Administration (FDA) http://www.fda.gov
12. Geological Survey (USGS) http://www.usgs.gov
13. National Science Foundation (NSF) http://www.nsf.gov

TERTIARY SOURCES



No to little review.

Tertiary sources should be avoided for your project. These sources have not been reviewed and are unreliable. They are often sources that are biased and lack evidence. **HOWEVER**, tertiary sources **CAN** be used to help you narrow your search for authors or research groups who are conducting research in your area of interest and whose names can be used in Web of Science to search for primary source journal articles or to search newspapers and other secondary sources, which can be used in your article.

Tertiary sources should NOT be used in your ScienceBite article because they are often difficult to define and have different meanings for different disciplines. Tertiary sources are NOT necessarily unreliable, but its often difficult to determine what information is unbiased and what type of information is biased.

A good example of a tertiary source, that should probably be avoided for this assignment, would be a company's website (that is, anything with a ".com" at the end). Apple (https://apple.com) and Microsoft (https://www.microsoft.com) are two very successful and well respected companies. However, Apple is most likely only going to present information that is favorable to Apple and the same is likely for Microsoft. This means that these sources may be biased and should NOT be used for your ScienceBite.

Another good example, of a tertiary source that should probably be avoided for this assignment would be some nonprofit organizations, or professional organization, which may have a biased view on a particular topic. These often have a ".org" website. Many of these companies are highly respectable and would be acceptable sources, however, its often difficult to determine, what is biased and what is unbiased.

Many of these organizations have noble causes and honorable missions, which is great, but that doesn't mean that you should use it as a source for your article.

What would be acceptable is if you visit one of these websites and read about a scientist who is doing some great research on your topic. Rather than use the non-profit organization's website directly as your source, you should copy and paste the name of the professor into Web of Science and find her or his journal articles (these are primary sources and acceptable for your ScienceBite) and use these journal articles as your source of information.

SCIENCEBITE GUIDE:

WRITING A TITLE AND ABSTRACT

Brian H. Lower, PhD
The Ohio State University

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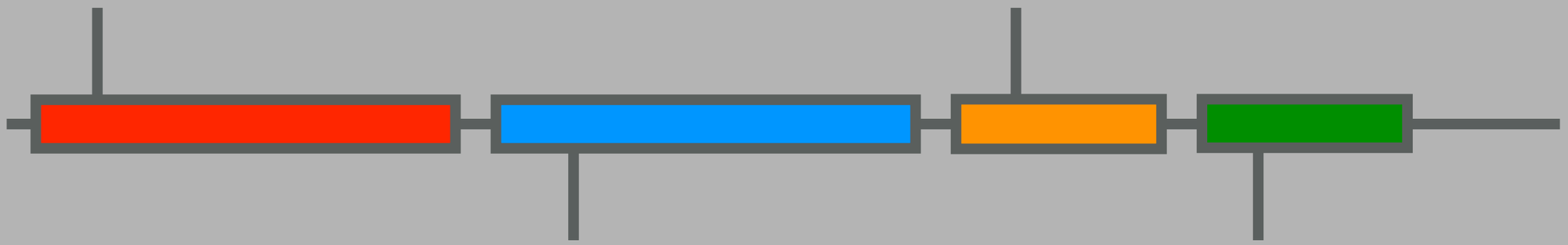
“ScienceBite Complete Guide” from Carmen

SCIENCEBITE TIMELINE

Week 1-3: Pick a Topic, find 10 references (6 need to be primary sources) and write abstract on Carmen.

Week **9-10:** Complete peer reviews of 2-3 manuscripts on Carmen.



Week 4-8: Write the first draft of your ScienceBite and submit to Carmen. Dr. Lower will assign 2-3 ScienceBites to review per student.

Week **11-12**: Write revised manuscript addressing the reviewers' concerns and submit final draft to Carmen.

COMPOSING A TITLE

Your title should be:

- Descriptive
- Unbiased
- Approximately 8-15 words in length
- Focused, NOT general
- Include the environmental issues, geographic location, and species of focus for your article

Wind Turbine Use Threatens San Francisco Bay Golden Eagle Population

Environmental Issue

Specific geographic location

Species of focus

You are writing a scientific article and so it should be UNBIASED. Your title and abstract should be UNBIASED. Meaning, for example, that you should avoid using adjectives, phrases and words that convey bias or feelings. So for example, you should **NOT** use the following title "Evil coal-fired power plants in Yucatan, Mexico linked to dangerous mercury levels that ruthlessly kill thousands of poor children".

Biased title and therefore NOT acceptable for a scientific article.

BAD TITLE

Let the data and results talk for themselves. Do NOT interject your own personal feelings. With the example above you CAN write a title like: "Mercury emissions from coal-fired power plants in Yucatan, Mexico linked genetically to developmental stress markers in children".

Unbiased title and therefore IS acceptable for a scientific article.

GOOD TITLE

Introductory Information

NAME: James E. Westinghouse

Your name as you would like it to appear in the publication.

Author Affiliation: Tundra State University, Department of Zoology, 101 North Pole Lane, Redknife River, Alaska (USA).

Author Major: Zoology

Your major at OSU (for example, Economics or Environmental Science).

Your major/home department at OSU (for example, Department of Chemistry or Department of Design or School of Earth Sciences).

If you do not know your department/school or your major at Ohio State, you should look it up here or contact your academic advisor. This is important academic information that all students should be aware of.

WRITING AN ABSTRACT

Fisheries Research 204 (2018) 156–164

Contents lists available at ScienceDirect

Fisheries Research

journal homepage: www.elsevier.com/locate/fishres

A 10-year comparison of the Pohnpei, Micronesia, commercial inshore fishery reveals an increasingly unsustainable fishery

Kevin L. Rhodes[a,*], Dalia X. Hernandez-Ortiz[b], Javier Cuetos-Bueno[b], McKye Ioanis[c], Welbert Washington[c], Ryan Ladore[d]

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[d] Pohnpei State Office of Fisheries and Aquaculture, P.O. Box 738, Kolonia, Pohnpei, 96941, Federated States of Micronesia

ARTICLE INFO

Handled by Dr. B Arara

Keywords:
Coral reef fisheries
Overfishing
Nighttime spearfishing
Management
Food security

ABSTRACT

In Pohnpei, Micronesia, a 10-year (2006–2015) follow-up market survey was conducted to provide the basis for a comparative assessment of the status of the commercial inshore fishery, to inform management and to identify the most relevant management options. Within this timeframe, marketed coral reef fish volumes declined by 50 mt (*ca.* 20%), the use of unsustainable fishing methods (nighttime spearfishing and small-mesh gillnets) increased from 75.5% to 81.9%, and catch-per-unit-effort decreased from 3.4 ± 0.1 to 3.2 ± 0.4 kg h^{-1} $fisher^{1}$. Simultaneously, the economic return as price per unit effort was nearly halved for all gear types. Trip volumes increased, however, this was paralleled by a rise in the average number of fishers per trip, particularly for nighttime spearfishing. Effort shifted from inner to outer reef areas and further away from high fisher density communities. At the family level, increases in the percentage of lower tropic level catch were observed, with herbivores and planktivores increasing in frequency in catch more than other trophic level fishes. The only weight increase among top carnivores was for epinephelids, however this was accompanied by a greater contribution by juveniles for the most commonly targeted grouper, Camouflage grouper, *Epinephelus polyphekadion*. Among fish families, eight epinephelids were absent in catch in 2015 compared to 2006, with additional species observed in speared catch in 2015 that were absent in 2006. To reverse continuing declines and prevent the potential for fisheries collapse, government needs to institute rights-based management, ban the use of nighttime spearfishing and small-mesh gillnets, and improve existing enforcement within marine protected areas and markets.

1. Introduction

Coastal communities in developing Pacific Island countries and territories (PICTs) are highly dependent on inshore coral reef resources for food and income (Bell et al., 2009), however rarely are they properly managed, in part due to a lack of information on their status and

Humphead wrasse (*Cheilinus undulatus*) (*e.g.*, Hensley and Sherwood, 1993; Dalzell et al., 1996; Houk et al., 2012). Perhaps more troubling is the demise throughout the region of fish spawning aggregations for some of the main target species of coastal commercial fisheries (*e.g.*, Rhodes et al., 2014a). The causes for these impacts are typically broad and often interconnected, and include natural, economic and anthro-

Abstracts are included at the very beginning of every journal article so that we can read a brief summary of the entire article.

An **abstract** is a **ONE** paragraph SUMMARY of your ENTIRE article. It should be **DESCRIPTIVE** enough so that it can **STAND ALONE** and tell the entire story that you want to convey to your reader. Abstracts contain NO figures and NO tables. The abstract consists strictly of words.

What should your abstract look like?

- 1 paragraph
- 250-350 words in length (10-20 sentences)
- Introduction (2-3 sentences)
- Material & Methods (2-3 sentences)
- Results (2-4 sentences)
- Discussion (2-4 sentences).
- (Optional) Conclusion/Future Work (1-2 sentences)

You do NOT have to cite your references in your abstract for this assignment. You MUST, however, cite your references in the actual ScienceBite manuscript when you start writing it later in the semester.

ABSTRACT: Over the past 40 years, polar bear (Ursus maritimus) populations in the Wanachee National Preserve have declined over 40%. This is particularly troubling considering that these animals are keystone predators and as such exert top-down population controls on many of the r-adapted species. Recent studies by the U.S. National Arctic and Atmospheric Association (NAAA) suggest that the denning behavior of female bears (sows) can be altered by ultrasonic light emitted by the aurora borealis (northern lights). Radiotelemetry and remote video cameras were used to examine polar bear denning behavior during March-May 2009 and March-May 2010. A total of 22 den sites and 18 sows (age 3-5 years) were observed during these periods. During this same period of time, 8 single-lens reflex (SLR) cameras were set 10 km apart to capture three-dimensional images of the aurora borealis. These measurements were used to determine the altitude at which electrons in the atmosphere emit the light that produced the aurora and the wavelength of light that was emitted at different quadrants and time. Results demonstrated that light having a wavelength of 250-385 nanometers (nm) caused 9 or the 18 young sows to abandon their dens after mating. Red-spectra light (600-715 nm) had no affect on the denning behavior. Pregnant sows exposed to ultraviolet light (100-175 nm) resulted in 67% higher fertility rates than sows that were not exposed to ultraviolet light. The results suggest that sows should spend at least 4 hours per day tanning themselves on ice flows prior to denning. Not only will this behavioral adaption likely led to higher rates of dermal cancer in female bears, the increasing number of female bears sunning themselves on icebergs will likely cause an influx of male bears (boars) to the Wanachee area. Further research needs to be conducted to determine if tanning lotions prevent ultraviolet exposure and thus lowers fertility rates and/or promote a deeper tan for the sunbathing sows. In addition, more studies are needed to determine which, if any, sunscreen boars prefer and whether the aurora affects courtship and/or foraging behavior in male bears.

Introduction

Material & Methods

Results

Discussion

Conclusion (optional)

TOTAL length of 250-350 words and 10-20 sentences.

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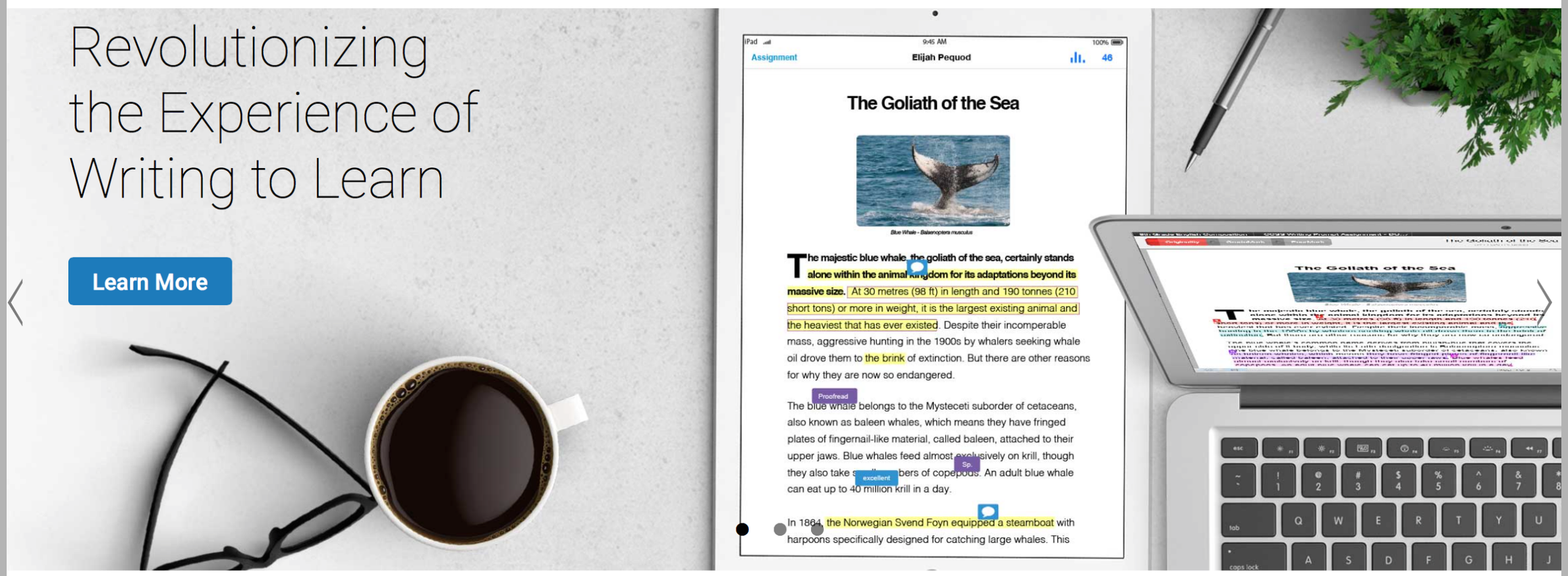

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We use Turn-It-In to check for unintentional plagiarism in this course. We recommend checking your manuscript using the PRACTICE Turn-It-In submission area on Carmen BEFORE submitting any of your final assignments. Review the ENR2100 Turn-It-In guide on Carmen for more information.

SCIENCEBITE GUIDE:

CITING REFERENCES

Brian H. Lower, PhD
The Ohio State University

You have likely been taught about MLA (Modern Language Association of America) or APA (American Psychological Association) formatting and style guide in middle or high school. Many of you are likely proficient in these styles or perhaps you hate them. In either case it doesn't matter because **you will NOT use MLA nor APA for writing your ScienceBite.**

There is a practical explanation for this and it's because their are literally thousands of different scientific journals published worldwide. And each journal has its own formatting style that is used to cite a source of information. Therefore, there is absolutely no reason for anyone in science to memorize the different formatting styles used by each journal. In fact, many scientists use software, that with a click of a button, will transform all of our citations into the proper style and format for a any journal.

For your ScienceBite articles, we will use a simple formatting style to cite all of your sources. The style was based on the journals Nature and Science. These styles are provided on the following pages. Each will provide: author(s) name, publication date, publisher's name (e.g., the name of the newspaper or journal where the article was published), and sometimes you will be asked to include volume, issue, patent number, and page number(s).

References *(Use Arial and 10 pt. font size)*

1. Strain, D. (2012, March 16). Climate Change Sends Beetles Into Overdrive. *Science.* Retrieved from http://www.sciencemag.org/news/2012/03/climate-change-sends-beetles-overdrive
2. Muzzin, M. (2011). *Dendroctonus ponderosae.* Animal Diversity Web. Retrieved from http://animaldiversity.org/accounts/Dendroctonus_ponderosae/
3. National Park Service. (2015, April 24). *Mountain Pine Beetle*. Retrieved from https://www.nps.gov/romo/learn/nature/mtn_pine_beetle_background.htm
4. Pelz, K., Cheng, T. (2015, October). Mountain Pine Beetle. *Colorado Encyclopedia.* Retrieved from https://coloradoencyclopedia.org/article/mountain-pine-beetle
5. Cooke, B.J., & Carroll, A.L. (2017 July 15). *Forest Ecology and Management*, **396**:11-25. https://doi.org/10.1016/j.foreco.2017.04.008
6. Rosenberger, D.W., et al. (2017 September). *Forest Ecology and Management*, **400**:28-37. https://doi.org/10.1016/j.foreco.2017.05.031
7. Bentz, B., et al. (2016). *Forestry: An International Journal of Forest Research*, **89**(3):271-283. https://doi.org/10.1093/forestry/cpv054
8. Schoennagel, T., et al. (2012). *PLOS ONE*, **7**(1): e30002. https://doi.org/10.1371/journal.pone.0030002
9. Mitton, J.B., Ferrenburg, S.M. (2012). *The American Naturalist*, **179**(5): E163-E171. https://doi.org/10.1086/665007
10. Bearup, L.A., et al. (2014). *Nature Climate Change*, **4**(6): 481-486

Each reference should include as much information as available in the following reference formats. References **give credit to the original source of the work** that you are using in your article. They also **allow the reader to return to this original source** if they so choose.

You should number your references and include them in the correct portion of the ScienceBite manuscript. You will use these to include citations within your ScienceBite article text.

STYLE FOR CITING A **PRIMARY SOURCE**

1. **Print Journal article**: Most journals are printed on paper. Authors, surname first followed by comma and initials of given names. Date in parenthesis. Journal title in italics. Volume number in bold, issue number in parenthesis:page numbers.

A. <u>Journal article with two authors:</u>

McMurran, M., & Christopher, G. (2009). *Legal & Criminological Psychology,* **14**(1):101-107.

B. <u>Journal article with more than two authors:</u>

Post, E., et al. (2009). *Science,* **325**(5946):1355-1358.

These are the two styles that you will use MOST OFTEN in your article.

2. **Online journal article:** These journals are electronic and NOT printed on paper. Should give authors, date of publication in parenthesis and journal or newspaper name in italics, volume number and or page numbers, followed by URL in full – or DOI if known.

Dionne, M.S., Schneider, D.S. (2002) *Genome Biol.* 3:REVIEWS1010. http://genomebiology.com/2002/3/4/reviews/1010

REQUIRED INFORMATION FOR EACH JOURNAL ARTICLE

Year Published

Authors Last Name, Initials

McMurran, M., & Christopher, G. (2009). *Legal & Criminological Psychology,* ***14***(1): 101-107.

Journal Name

Page Number

(Issue Number)

Volume Number

STYLE FOR CITING A **PRIMARY SOURCE**

3. **Patent:** Name surname first followed by comma and initials of given names. Date in parenthesis. Title of patented item/process in italics. Patent number.

   Odell, J.C. (1970, April). Process for batch culturing. U.S. patent 484,363,770.

STYLE FOR CITING A **SECONDARY SOURCE**

1. **Book Chapter**: Authors surname first followed by comma and initials of given names. Date of publication in parenthesis. Chapter title, page numbers. Editors of book, book title in italics, city of publication, name of publisher.

   Forman, M.S., and Valsamakis, A. (2003). Specimen collection, transport, and processing: virology, p 1227-1241. Murray, P.R., et al. (Eds.), Manual of clinical microbiology, 8th ed, Washington, D.C.: Penguin Press.

2. **Book**: Authors surname first followed by comma and initials of given names. Date of publication in parenthesis. Book title. Editors of book, name of publisher.

   Anderegg, D. (2007). Nerds: Who they are and why we need more of them. New York: Jeremy P. Tarcher, Penguin Press.

3. **Magazine Article in print**: Authors name. Title of article. Publication date. Title of magazine, volume number, issue number, page numbers.

   Miller, J. M. Road map to a great deal. (2009, October). Consumer Reports, 74(10), 44-47.

STYLE FOR CITING A **SECONDARY SOURCE**

4. **Magazine article in a database:** Author. Publication date. Title of publication. Name of magazine. Volume number, page numbers, web address.

   Taibbi, M. (2009, September 3). Sick and wrong. Rolling Stone, 1086, 58-65. Retrieved from http://www.rollingstone.com.

5. **Newspaper Article in print:** Author. Publication date. Title of publication. Name of newspaper. page numbers.

   Lucchetti, A. & Craig, S. (2009, September 11). Morgan Stanley taps new boss. The Wall Street Journal, pp. A1, A16.

6. **Newspaper article in a database:** Author. Publication date. Title of publication. Name of newspaper. web address.

   Moran, S. (2009, September 7). If you don't snooze, you lose: Most Americans aren't getting enough sleep. And for both adults and students, there are health consequences. Star Tribune. Retrieved from http://www.startribune.com.

STYLE FOR CITING A **SECONDARY SOURCE**

7. **Podcast:** Producer. Publication date. Title of podcast [video or audio]. Date retrieved from Internet, web address.

   Nature (Producer). (2009, July 16). Moon gazing [Audio podcast]. Retrieved November 5, 2009, from http://www.nature.com/nature/podcast/index-2009-07-16.html.

8. **Video / Movie:** Producers and Director. Date of Release. Title of movie [DVD or film]. Film company who released video.

   Donner, R. & Lee, S. (Producers), & Hood, G. (Director). (2009). *X-Men Origins: Wolverine* [DVD]. USA: Twentieth Century-Fox Film Corporation.

9. **Webpage:** Author. Publication date. Title of webpage. Web address.

   Roszak, T. (1996, September). Why ecology needs psychology, why psychology needs ecology. *Ecopsychology Online*, 1. Retrieved from http://ecopsychology.athabascau.ca/0996/ecowelcome.html.

STYLE FOR CITING A **SECONDARY SOURCE**

10. **Webpage organization or Group of authors:** Organization. Publication date. Title of webpage. Web address.

    National Museum of American History. (2006, July 7). *National museum of American history displays recent hip-hop acquisitions.* Retrieved from http://www.americanhistory.si.edu/news/pressrelease.cfm?key=29&newskey=383.

SCIENCEBITE GUIDE:

ARTICLE FIGURES

Brian H. Lower, Ph.D.
The Ohio State University

ScienceBite Figure Requirements

Figures (Illustrations, tables, graphs and photographs)

1. You need a minimum of 4 and can use a maximum of 6 figures.

2. The figures should be high quality and/or high-resolution images.

3. You should include a variety of figures i.e. not all the same type of figure (photograph, table, graph, etc).

4. You need to include at least 1 original figure that you yourself designed, created or photographed.

Legends for figures, illustrations, tables, graphs, and photographs

1. Figure legends should be short (that is, less than 50 words) but descriptive.

2. Remember to cite the source of your figure if you are not using an original figure that you made yourself.

Your ScienceBite article should include 4-6 figures (illustrations, graphs, tables, photographs, etc) that are high quality and help to describe your topic. Figures assist the reader of your article to better understand your topic and should be able to stand alone with the captions that you compose for them. Figures are important elements of all scientific papers and assist scientists in conveying research results and the importance of their research topics.

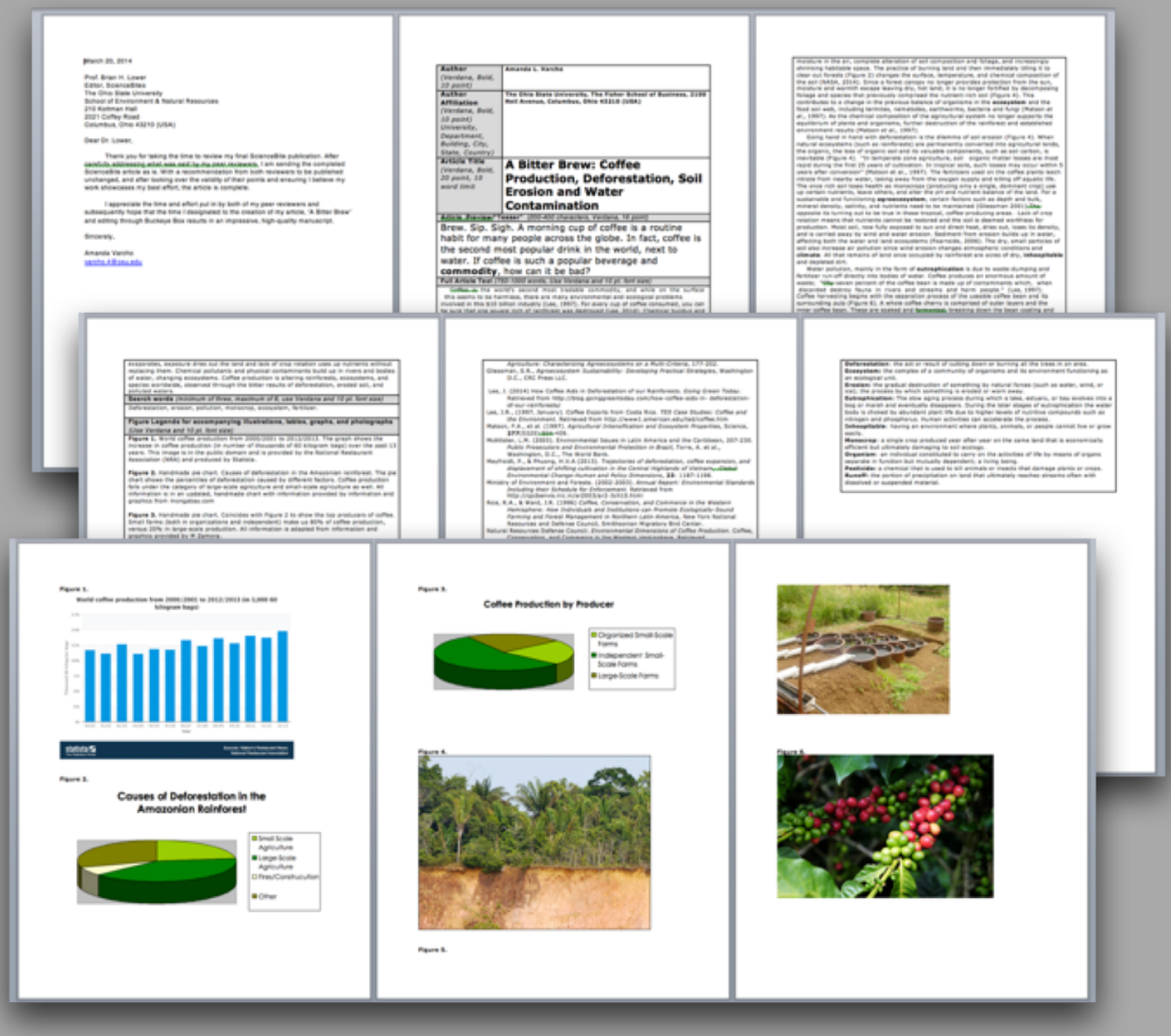
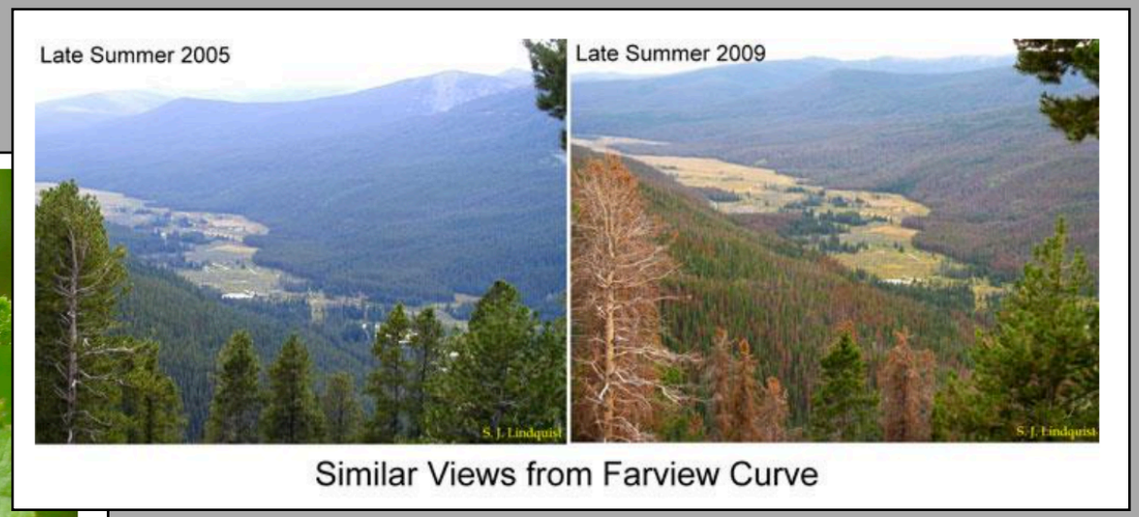
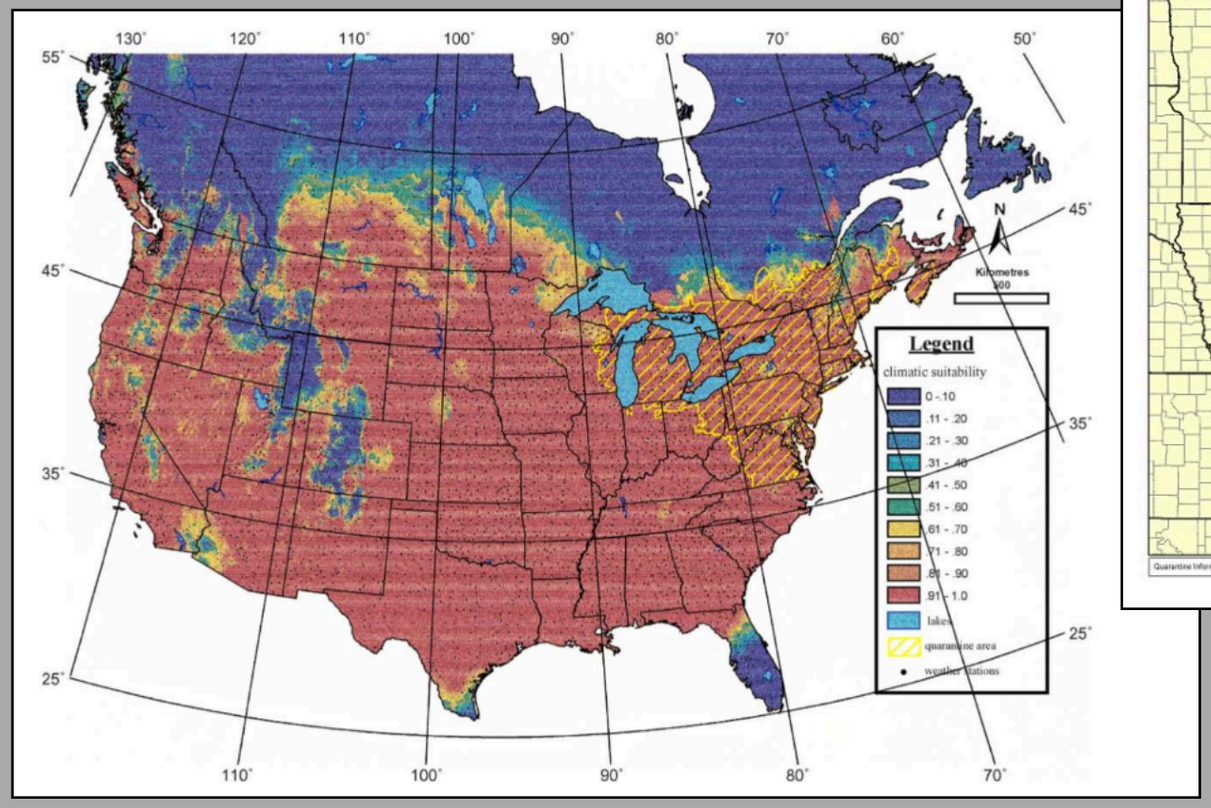
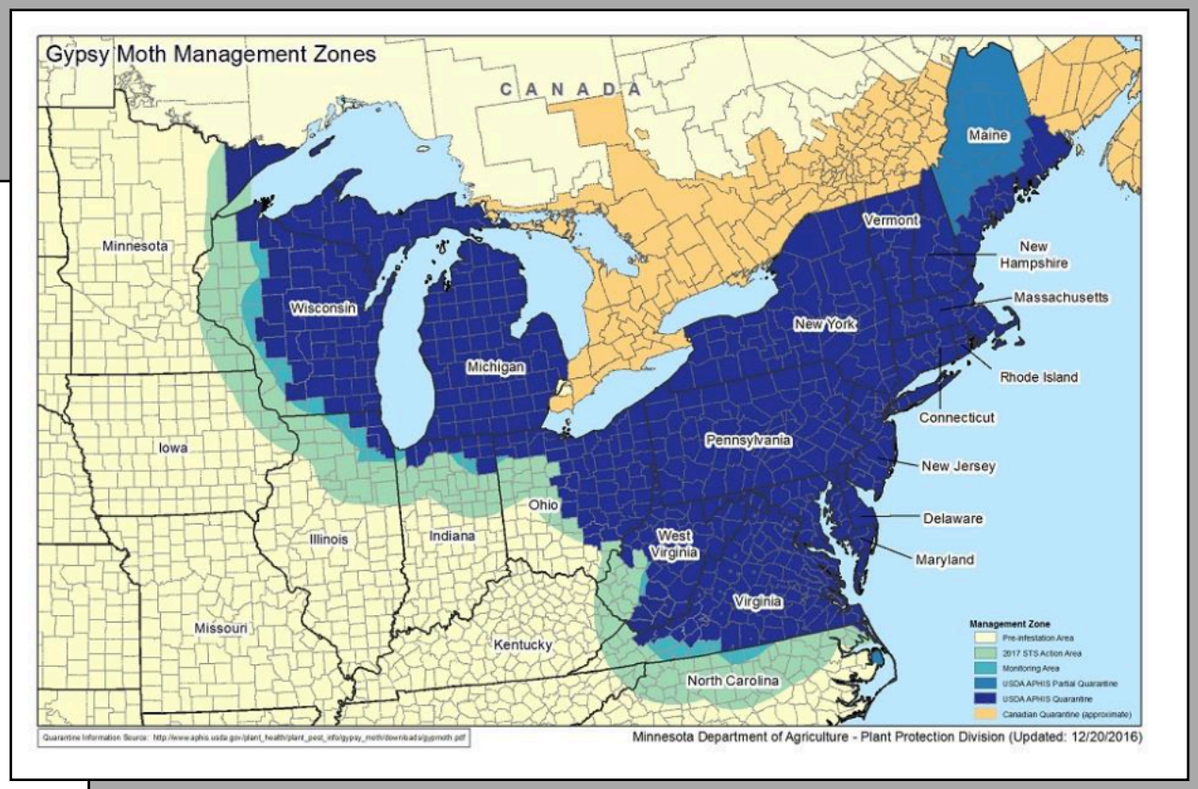


Figure Types for your ScienceBite

Photographs

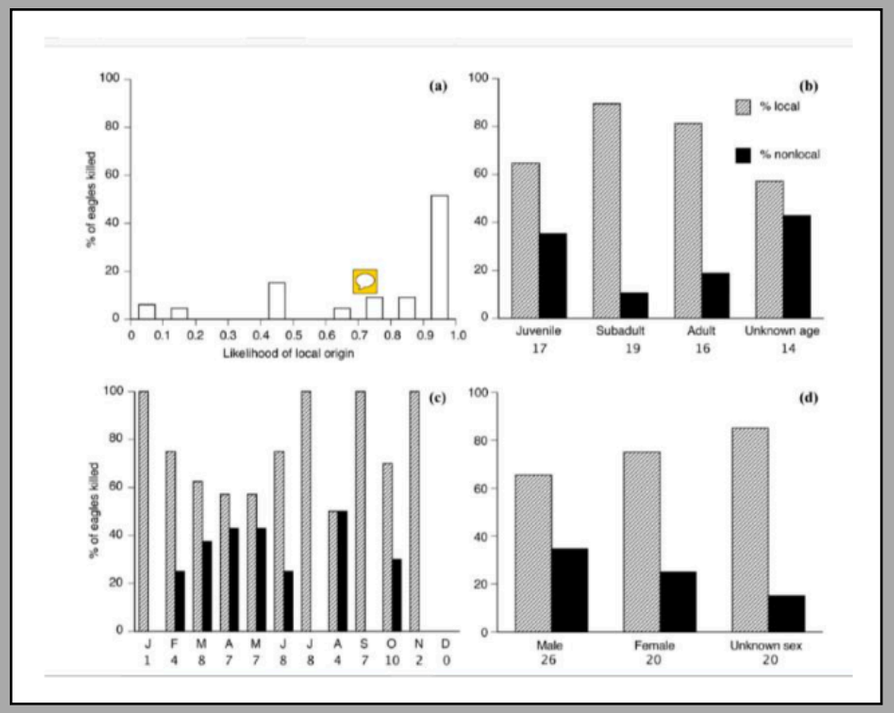


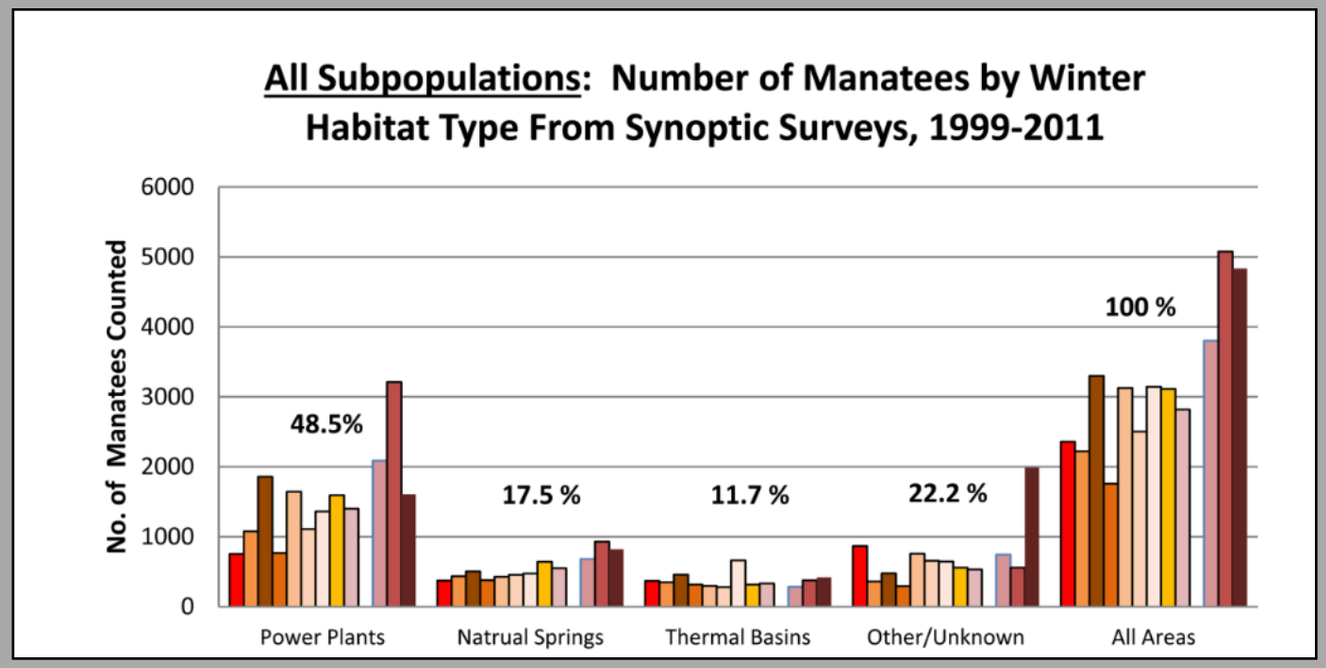


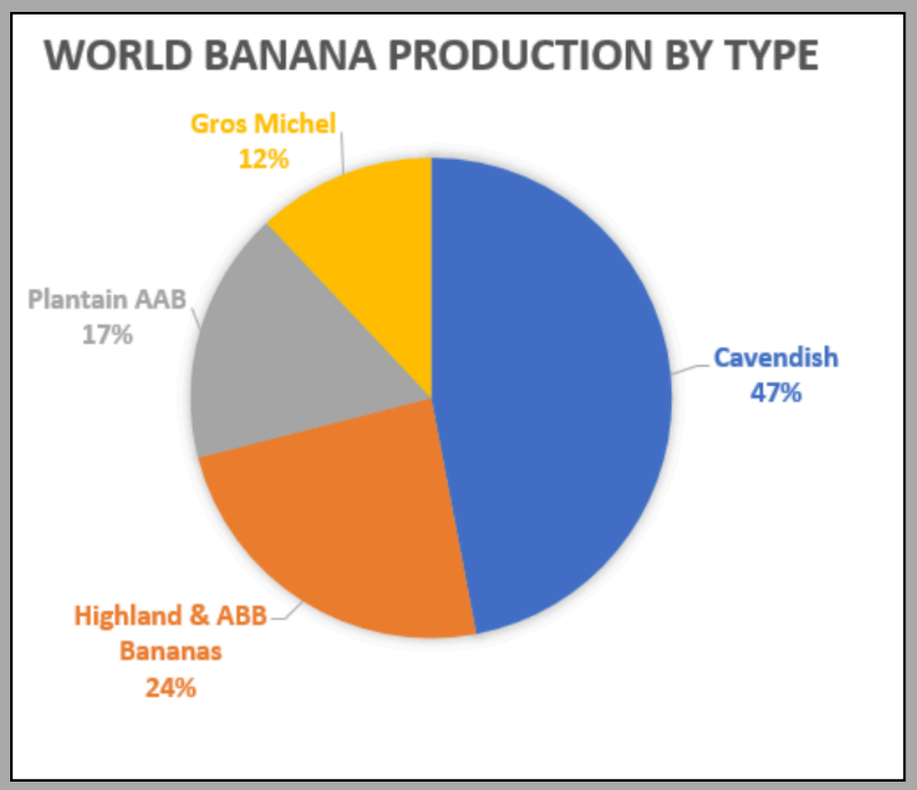


Maps

Figure Types for your ScienceBite







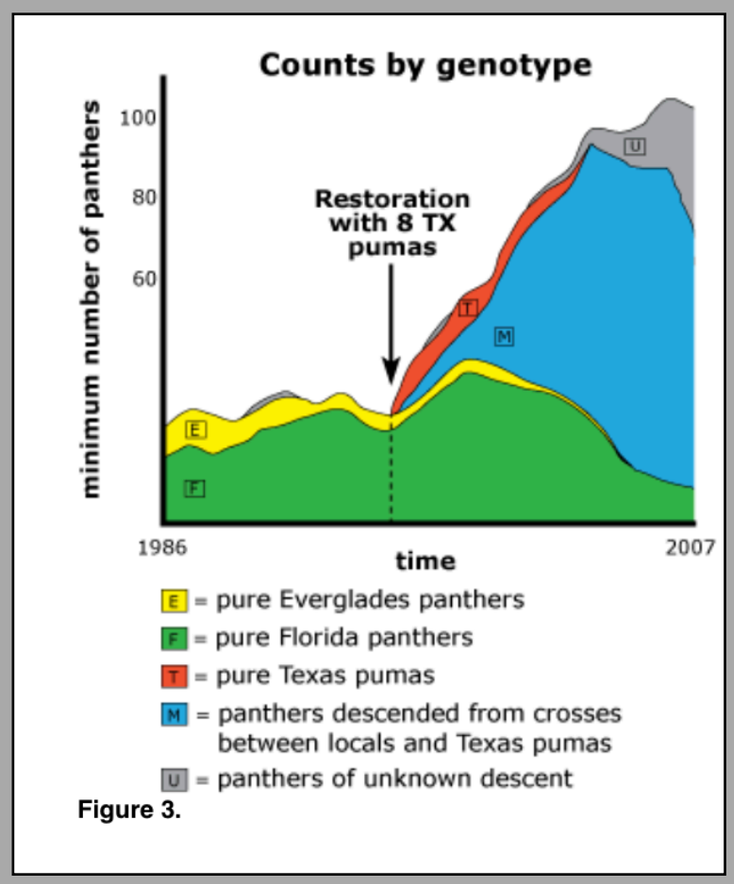


Figure 3.

Graphs

Most ScienceBite articles should contain at least one graph. Graphs assist scientists in displaying statistical information.

Figure Types for your ScienceBite

Aransas/Wood Buffalo Whooping Crane Population: 1940-2007

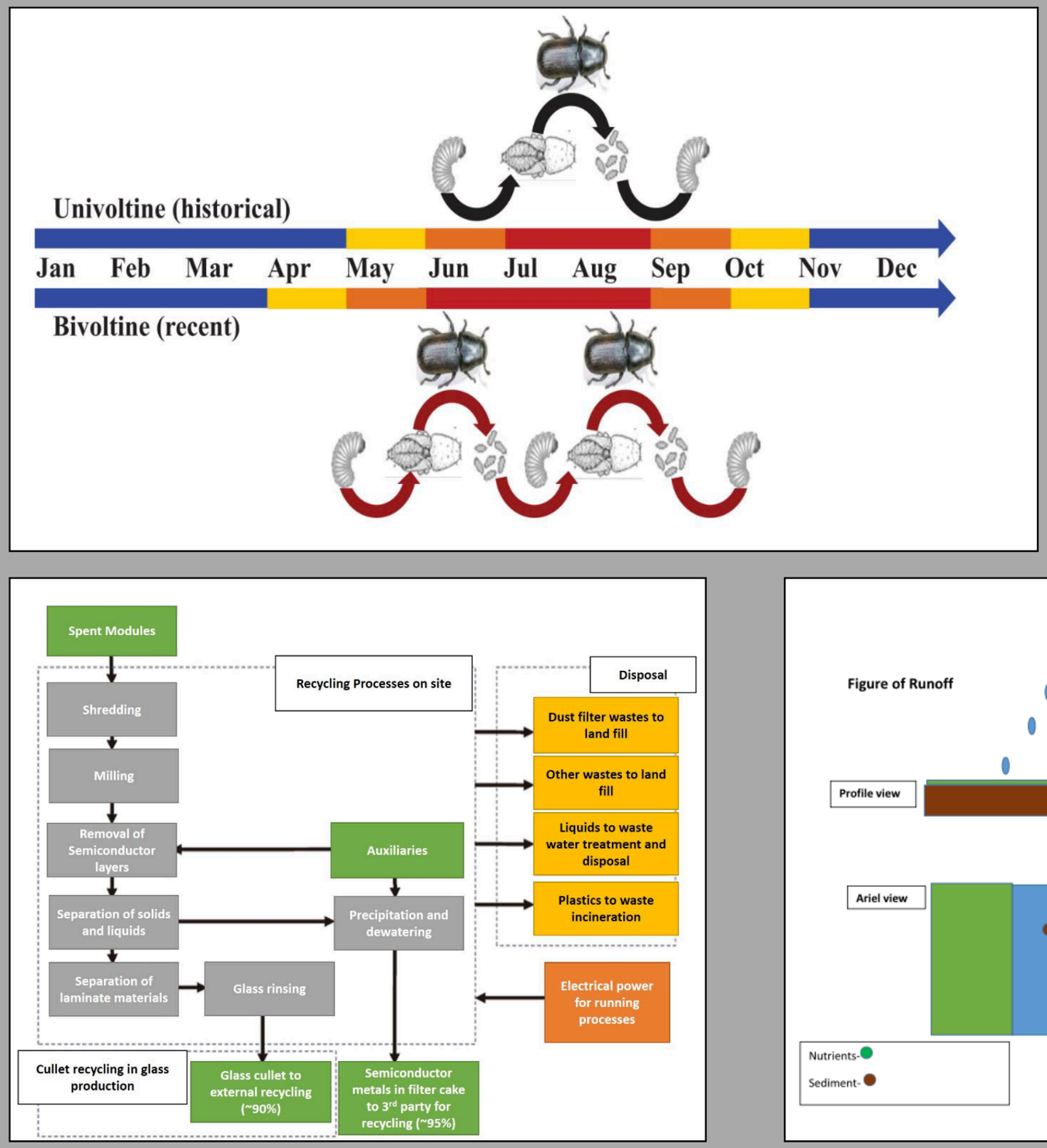
Year	Crane Population	Year	Crane Population	Year	Crane Population
1940	26	1993	143	2001	175
1950	31	1994	133	2002	185
1960	36	1995	158	2003	194
1970	57	1996	160	2004	217
1980	78	1997	182	2005	220
1990	146	1998	183	2006	237
1991	132	1999	188	2007	266
1992	136	2000	180		

Tables or Charts

Table 1 General differences between burial grounds

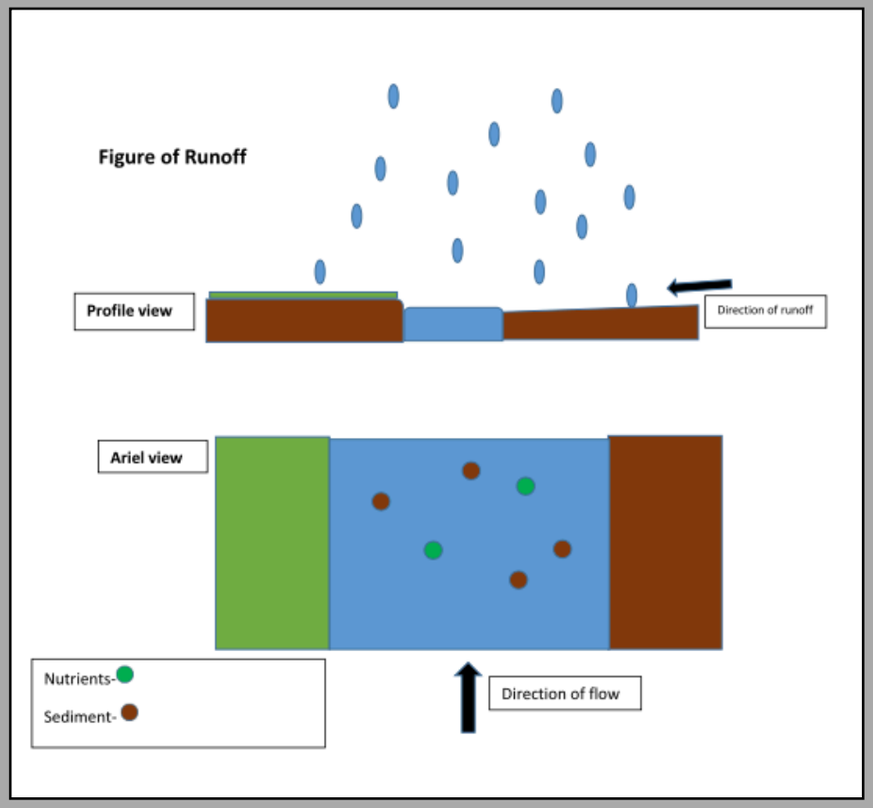
	Burial site		
Characteristics	Cemeteries*	Park cemeteries	Green cemeteries
Boundaries	Established perimeter with an entrance gate that declares the purpose of the site	Similar to urban parks	Without defined boundaries
Organisation	Divided by roads and paths. The graves are well ordered	Uniform rows	Graves are located by global positioning system
Grave markers	Ranging from elaborate statues and monuments to small plaques	Small plaque	Usually none but small wood plaques without chemical treatments are allowed
Grave covering	Pavement or grass	Grass	Native plants
Inhumation depth	About 1.80 m	About 1.30 m	Active layer of soil. Inhumation of ashes is not allowed
Materials used	Usually materials are not controlled	Usually materials are not controlled	Biodegradable materials from sustainable sources. Embalmment is not allowed

Figure Types for your ScienceBite



Timelines, Flowcharts, and more!

Be creative. You can always modify or create a figure to fit your needs.



Do not use blurry or low resolution figures.

Figures always have two parts:

1. The figure itself.

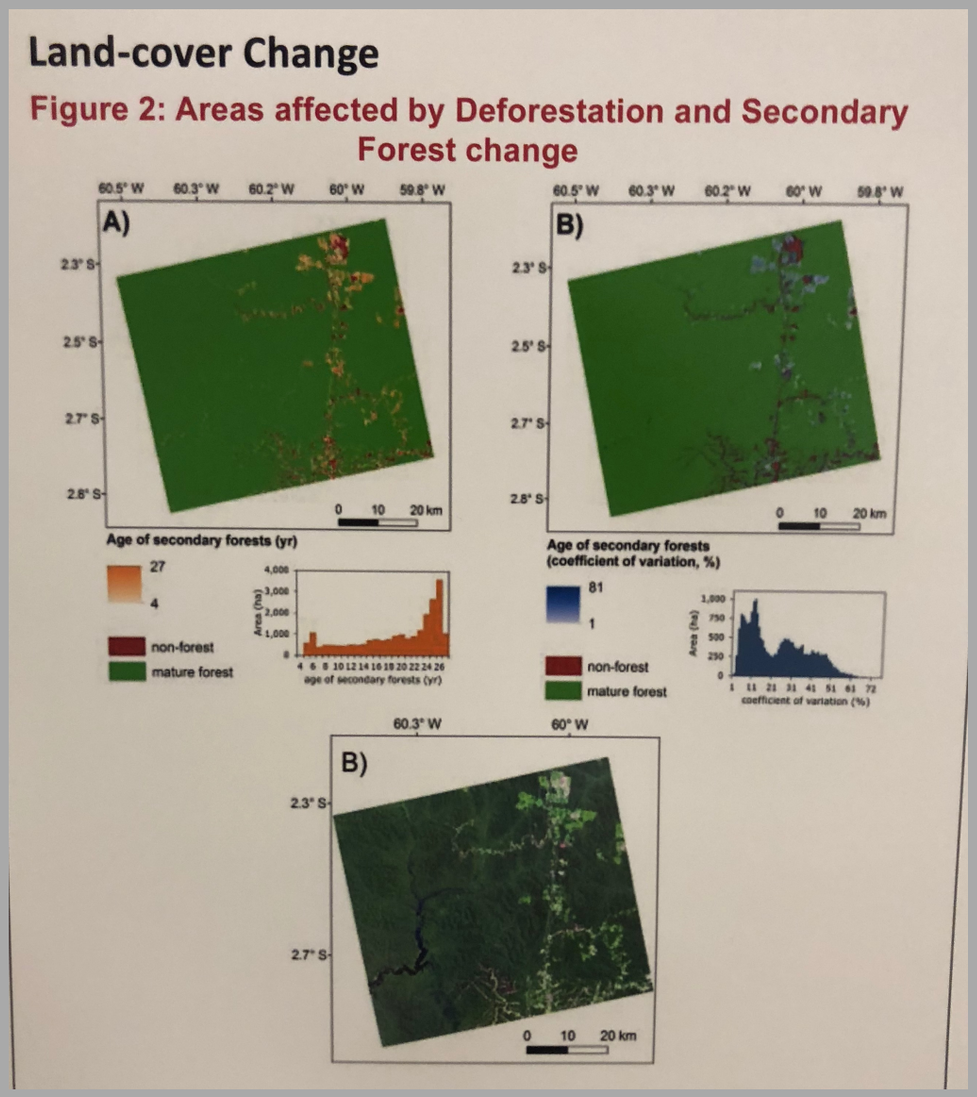
2. The figure caption. This will accompany the figure and describe the figure to the reader.

Figures may have a third part if you based your figure on a previously published source. If you did, you need to remember to include a citation:

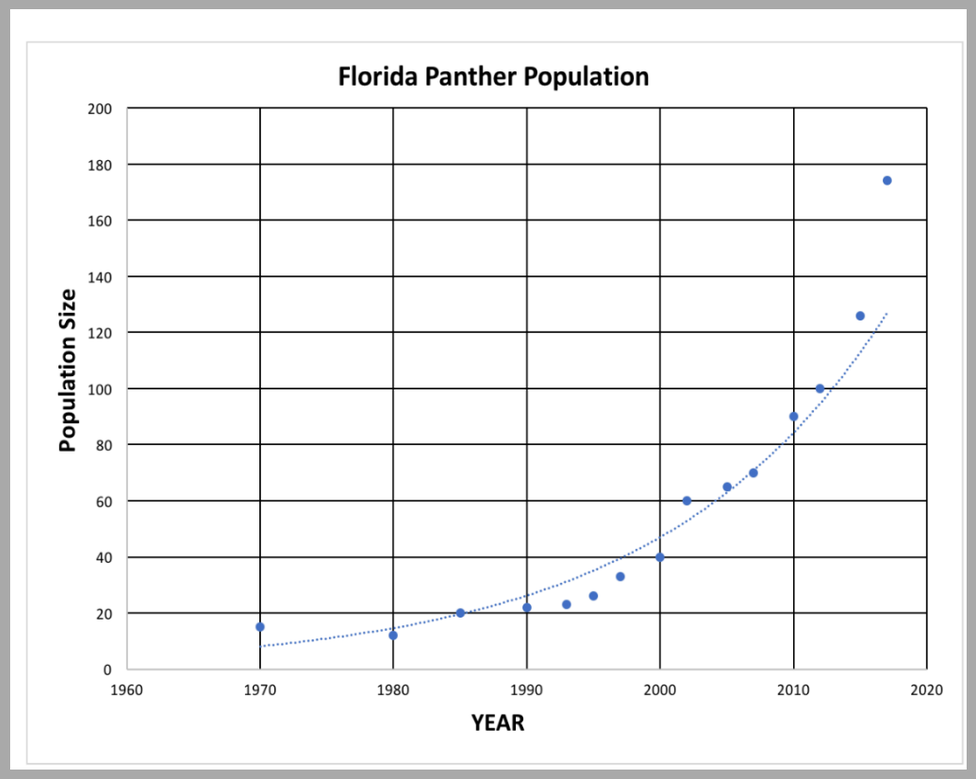
3. Cite your source in your References section.

DESIGNING YOUR ORIGINAL FIGURE

For your ScienceBite article you need to include at least 1 original figure that you yourself designed, created or photographed. This figure can be any of the previously shown figure types.



Example of a student created figure. This student used GIS software to show land cover changes as a result of deforestation in Brazil.



Example of a student created figure. This student used data found from the Fish and Wildlife Service to graph the population size of Florida Panthers over several years — and predict the future populations.

6 Steps for Creating a Figure

1. Find, download and organize your material on your computer.

2. Use Apple Keynote, Microsoft PowerPoint or Adobe Photoshop to **create your figure and save it as a JPEG file (Part 1)**.

3. Write a thorough, organized and descriptive **figure caption (Part 2)**.

4. Include the **references (Part 3)** for your material.

5. Properly cite other people's work.

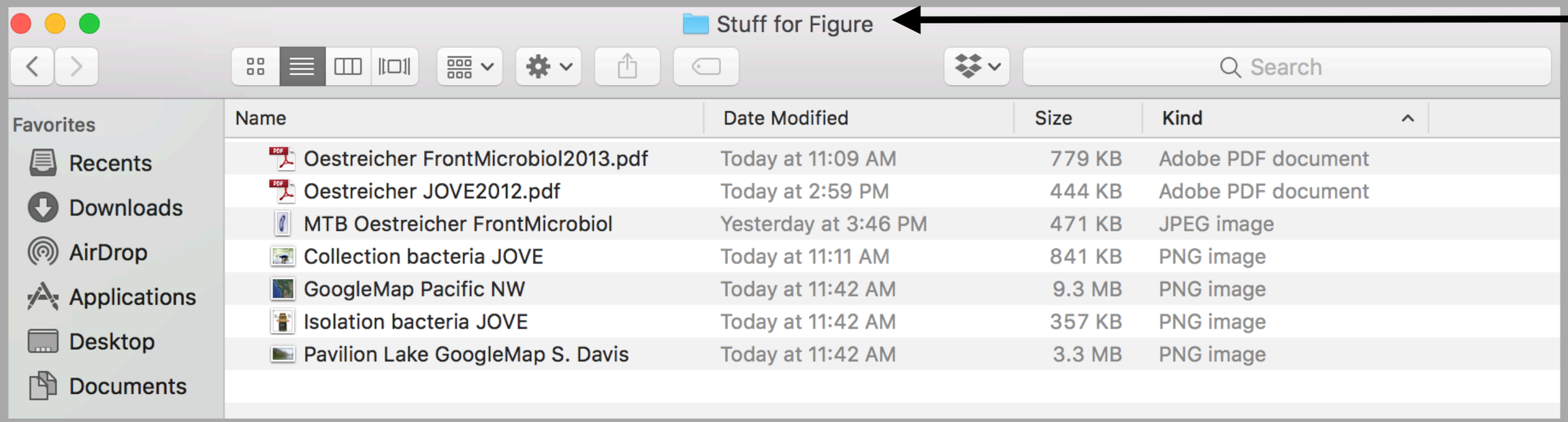
6. Be prepared to discuss your figure in detail.

*Each figure will take you 1-3 hours to complete all six steps.

The next few slides show the figure that I designed using Apple Keynote. Use whichever software program you are most comfortable using.

Other programs that you can use to modify or create figures include:

- **Microsoft Powerpoint**
- **Microsoft Excel**
- **Adobe Photoshop**
- **Adobe Illustrator**
- **Pixlr**



STEP 1. ORGANIZE MATERIALS

To create a figure you need to gather, download and organize your materials into a folder on your computer. Then you will use software to create the actual figure.

In this example, you can see that I have downloaded all the files that I will need to create one figure. These files are saved on my computer in a folder called "**Stuff for Figure**". Inside this folder you can see that I have **2 PDF files**, **1 JPEG file** and **4 PNG files**. The PDF files are 2 journal articles that I am using for my poster. The JPEG and PNG files are images that I will use to create my figure.

STEP 2. CREATE FIGURE

You will create 4-6 figures for your ScienceBite article. A figure can be a graph, table, map, diagram, photograph, etc.

I like to use Apple Keynote to create my figures. I used Keynote and all the material that I had in my folder “Stuff for Figure” to create Figure 1, which you can see on the next slide.

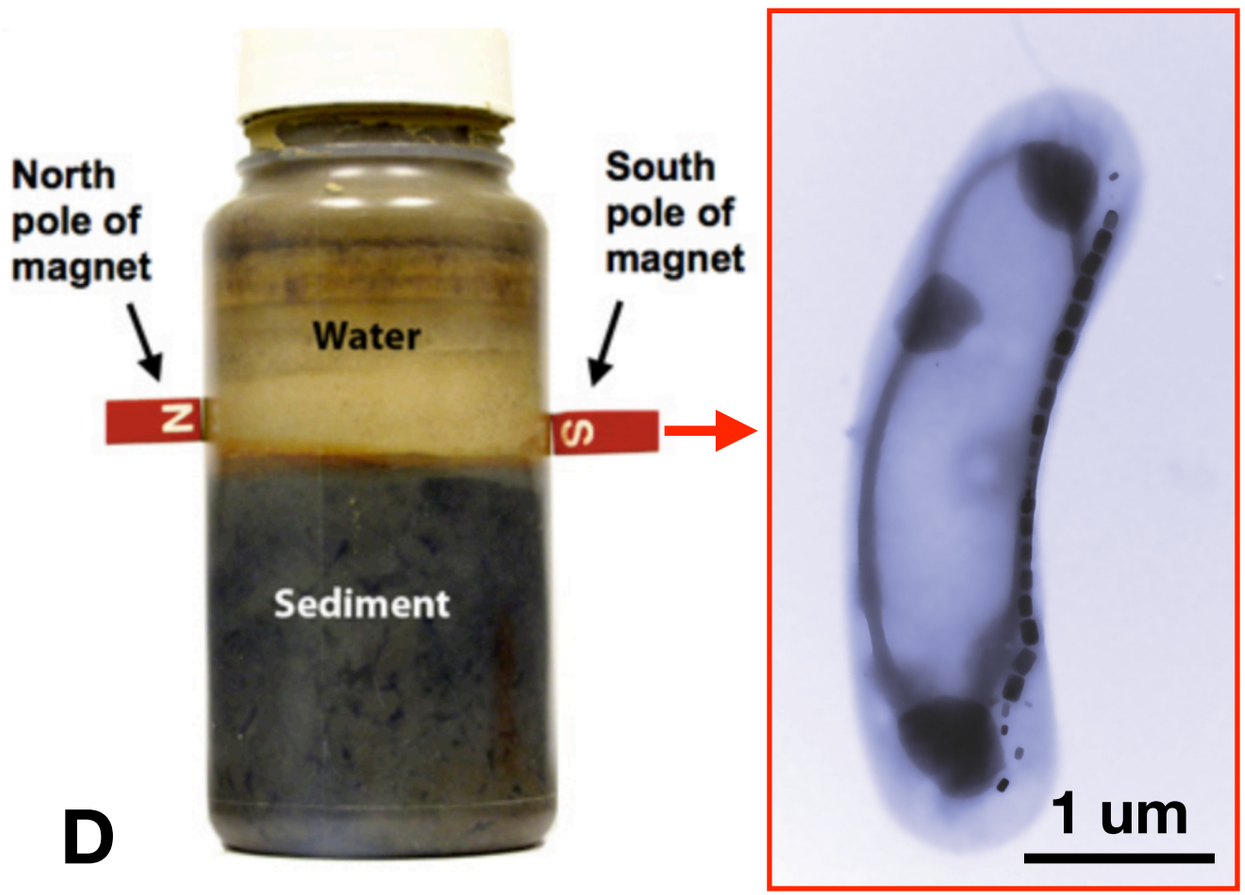
I will use Figure 1 in the Introduction section of my poster (or article) to introduce the audience to my research topic, which is the ecology of magnetotactic bacteria in Pavilion Lake, British Columbia.

I will use Figure 1 to show my audience where Pavilion Lake is located, what the lake looks like, what magnetotactic bacteria look like under the microscope, where the research area is located and how the researchers collected and isolated the bacteria from Pavilion Lake.


Kamloops
Vernon
Pavilion Lake
Vancouver Island
Vancouver
Nanaimo
Surrey
Victoria
COLVILLE RESERVATION
Everett
Spokane
Seattle
100 km
Tacoma
WASHINGTON
Yakima
YAKAMA INDIAN RESERVATION
Kennewick
A


B


C


North pole of magnet
South pole of magnet
Water
N
S
Sediment
D
1 um

So now I have a publication quality figure that I'd like to use for my article. What I need to do next is save the figure as either a TIFF or JPEG file. Most publishers only accept TIFF or JPEG files. Make sure you save these images with the highest quality resolution possible.

I'm using Apple Keynote to design this figure. So to save it as a TIFF file I select File > Export > Images. You'll have a choice to save as a JPEG, PNG or TIFF file. Select TIFF and save this file to your desktop. If you choose to save it as a JPEG, make sure you select highest quality.

STEP 3. WRITE FIGURE CAPTION

All figures need a caption to describe what is contained in the figure. This caption should also tell the audience where the material was obtained (i.e., what references did you use). Here is the caption for Figure 1:

Figure 1. Collection and isolation of magnetotactic bacteria from Pavilion Lake. (A) Map showing the location of Pavilion Lake in British Columbia, Canada at 50.87^{o} North, 121.74^{o} West. Map obtained using Google Maps. The maximum lake depth is 70 meters, length is 5.75 km, maximum width is 0.8 km, and surface elevation is 820 meters. (B) Photograph of Pavilion Lake obtained from Google Maps and taken by S. Davies in August, 2016 near the location where bacteria samples were taken. (C) Photograph of scientist collecting magnetotactic bacteria from Pavilion Lake. Obtained from Oestreicher et al., 2012, Journal of Visualized Experiments Vol. 69, e50123. (D) Isolation of magnetotactic bacteria using magnets and a transmission electron microscope image of a single bacterium. Images obtained from Oestreicher et al., 2013, Frontiers in Microbiology, Vol. 4, article 406, pages 1-6.

STEP 4. INCLUDE FIGURE REFERENCES

You will most likely need to cite the source(s) for your figure. The only way that you do NOT need to cite a source is if YOU collect the data or photograph yourself. If you obtained the data (e.g., graph, table, map, equation) from a journal article or newspaper, then you MUST cite the source. For my figure I used two journal articles as my sources and so I MUST cited these two sources in the reference section of my article or poster:

1. Oestreicher et al., 2013, Frontiers in Microbiology, Vol. 4, article 406, pp. 1-6.
2. Oestreicher et al., 2012, Journal of Visualized Experiments, Vol. 69, pp. e50123.

STEP 5. PROVIDE CITATIONS FOR THE WORK OF OTHERS:

If you use someone else's photograph or work in your figures then you MUST given them proper credit. For Figure 1, I use previously published research from 4 different sources (listed as i, ii, iii, iv below). You'll notice that Figure 1 contains a map from Google Maps and a photograph from Google Maps that was taken by S. Davies. I obtained both of these online. I need to provide proper credit for these two sources and so in my FIGURE CAPTION the text reads that the map and photograph of Pavilion Lake were obtained from Google Maps and the photograph was taken by S. Davis. This way I am giving credit to all of my sources (i.e., **(i) Google** and **(ii) S. Davis**) and I am NOT plagiarizing their work. For figure 1, I also included the previous research of Oestreicher et al., 2013, Frontiers in Microbiology, Vol. 4, article 406, pp. 1-6 and Oestreicher et al., 2012, Journal of Visualized Experiments, Vol. 69, pp. e50123. And so I must cite these two journal articles as well. This way I am NOT plagiarizing the work of **(iii) Oestreicher et al., 2012** and **(iv) Oestreicher et al., 2013**.

STEP 6. THE AUTHOR (YOU) UNDERSTANDS THE FIGURE

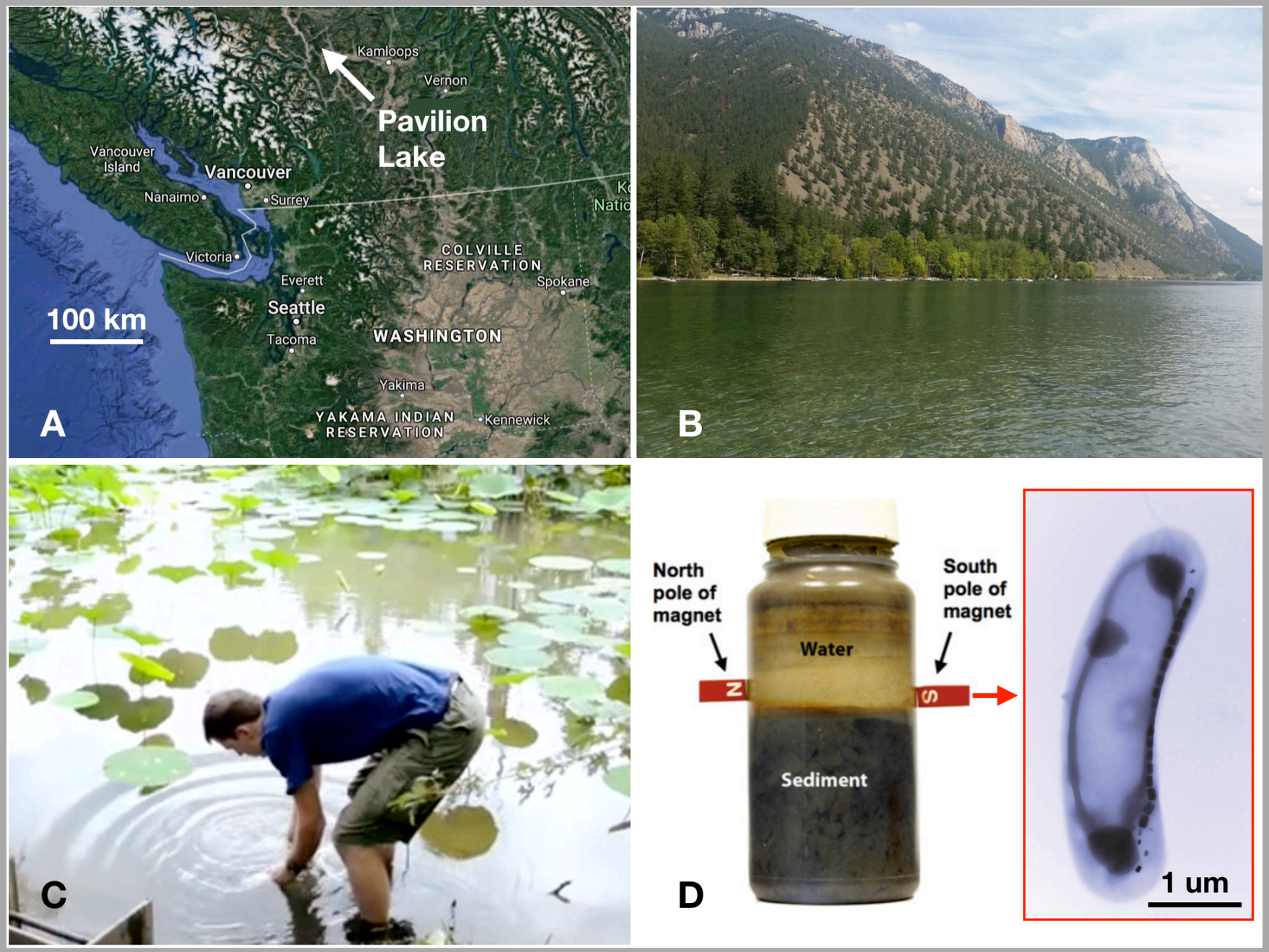
You need to understand every detail of your figure and communicate the information contained in the figure to your audience. This means that you communicate with your audience in well-written sentences and paragraphs for articles or posters, or communicated with your audience verbally AND nonverbally (e.g., using your hands to point to the bacteria on Figure 1 and describe the different parts of the figure) for talks and presentations.

In all honesty, you should be able to spend a minimum of 3 minutes talking to your audience about each figure. If you can't do this then you (1) don't understand the figure well enough and you need to do some reading/studying yourself to learn the material or (2) your figure doesn't contain enough useful information and it is completely useless for your article or poster and you need to re-design the figure so that it is meaningful to the research that you present in your article or poster.

When you have completed all 6 steps then your figures should look like this example.

You can see that Figure 1 contains all three parts of a figure:

1. **Figure**
2. **Caption**
3. **References**



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References:

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