

Course Syllabus**ATM 620: Climate Journal Club: Precipitation, 1 credit****Department of Atmospheric Sciences, University of Alaska Fairbanks, Spring 2021****Instructor:** Ums S. Bhatt (474-2662, usbhatt@alaska.edu)**When:** Friday 3-4 PM, Zoom and in class (once deemed safe) in 319 Akasofu**CRN:** 32914**Office Hours:** N/A**Course Webpage:** <https://classroom.google.com/c/MjUwMzcyNTI3NzQw?cjc=quxgass>**Weekly Schedule:** below

Prerequisites: Upper level undergraduate/graduate standing and a basic knowledge of meteorology and/or oceanography, climate, environmental science, such that the student is able to engage in classroom discussions.

Course Description: We will read papers and discuss past, present and future of precipitation with a focus on higher latitudes.

Materials needed:

- Resources: pdfs will be provided of weekly papers
- Computer to join class by zoom until we can meet in person and to upload homework

Course Goals:

To become familiar with the observations, climate model precipitation, and future of precipitation.

Course Policies:

Students are expected to prepare for weekly meetings through readings and to engage in class activities and discussions. Each student will lead one paper discussion. Brief summaries (1 paragraph) of the weekly readings will be due on Fridays before the start of class. Paper summaries will consist of around ½ page of text using the format of an APE paragraph (See final page of syllabus for a description of an APE paragraph).

Instructional Methods:

This is primarily a discussion class but will have a few sessions with lectures as appropriate.

Expected Proficiencies (Student Learning Outcomes):

- Learn to discuss science in an effective manner
- Develop skills to read papers critically
- Improve scientific writing skills
- Learn about precipitation in higher latitudes

Evaluation:

Students are expected to attend the class, do any required reading, write the weekly paper summaries, participate in discussions and share their ideas. The class will be graded Pass/Fail. A

passing grade requires an overall percentage of 80% or greater. 100% of the grade will be based on attendance, class participation, and paper summaries.

Support Services:

Additional help can be obtained from the instructors, as well as faculty and students who have expertise on the topic of concern.

Disabilities Services:

The Office of Disability Services implements the Americans with Disabilities Act (ADA), and insures that UAF students have equal access to the campus and course materials. We will work with the Office of Disabilities Services (203 WHIT, 474-7043) to provide reasonable accommodation to students with disabilities.

Semester Calendar: See course schedule for updated schedule

Week/Date	Topic	Resources	Due on class day by 3PM
Week 1 –15 Jan	Review Syllabus & Expectations, Lecture on Precipitation Overview		
Week 2 – 22 Jan	Walsh J E 2021: ‘Arctic Climate Change, Variability, and Extremes’, Chapter 1 in Yang and Kane (Eds.), ‘Arctic Hydrology, Permafrost and Ecosystems, Springer 1 st edition 397 pp., pdf		Summary
Week 3 – 29 Jan	Johnsen, S. J., Dansgaard, W., & White, J. W. C. (1989). The origin of Arctic precipitation under present and glacial conditions. <i>Tellus B: Chemical and Physical Meteorology</i> , 41(4), 452-468. pdf		
Week 4 – 5 Feb	Miller, G. H., Brigham-Grette, J., Alley, R. B., Anderson, L., Bauch, H. A., Douglas, M. S. V., ... & Wolff, E. W. (2010). Temperature and precipitation history of the Arctic. <i>Quaternary Science Reviews</i> , 29(15-16), 1679-1715. pdf		Summary
Week 5 – 12 Feb	Ye, Hengchun et al: 2021: Precipitation Characteristics and Changes, Chapter 2 in Yang and Kane (Eds.) 2021: ‘Arctic Hydrology, Permafrost and Ecosystems, Springer 1 st edition 397 pp. pdf		Summary
Week 6 – 19 Feb	Serreze, M. C., & Hurst, C. M. (2000). Representation of mean Arctic precipitation from NCEP–NCAR and ERA reanalyses. <i>Journal of Climate</i> , 13(1), 182-201. pdf		Summary
Week 7 – 26 Feb	Vihma, T., Screen, J., Tjernström, M., Newton, B., Zhang, X., Popova, V., ... & Prowse, T. (2016). The atmospheric role in the Arctic water cycle: A review on processes, past and future changes, and their impacts. <i>Journal of Geophysical Research: Biogeosciences</i> , 121(3), 586-620. pdf		Summary

Week 8 – 5 Mar	Nygård, T., Naakka, T., & Vihma, T. (2020). Horizontal moisture transport dominates the regional moistening patterns in the Arctic. <i>Journal of Climate</i> , 33(16), 6793-6807. pdf	Summary
Spring Break March 8-12 2021		
Week 9 – 19 Mar	Naakka, T., Nygård, T., Vihma, T., Sedlar, J., & Graversen, R. (2019). Atmospheric moisture transport between mid-latitudes and the Arctic: Regional, seasonal and vertical distributions. <i>International Journal of Climatology</i> , 39(6), 2862-2879. pdf	Summary
Week 10 – 26 Mar	Bintanja, R. (2018). The impact of Arctic warming on increased rainfall. <i>Scientific reports</i> , 8(1), 1-6. pdf	Summary
Week 11 – 2 Apr	Routson, C. C., N. P. McKay, D. S. Kaufman, M. P. Erb, H. Gooose, B. N. Shuman, J. R. Rodysill, and T. Ault, 2019: Mid-latitude net precipitation decreased with Arctic warming during the Holocene. <i>Nature</i> , 568, 83–87, https://doi.org/10.1038/s41586-019-1060-3 . pdf	Summary
Week 12 – 9 Apr	Bintanja, R., van der Wiel, K., Van der Linden, E. C., Reusen, J., Bogerd, L., Krikken, F., & Selten, F. M. (2020). Strong future increases in Arctic precipitation variability linked to poleward moisture transport. <i>Science advances</i> , 6(7), eaax6869. pdf	Summary
Week 13 – 16 Apr	Class choice – some hot new paper?	Summary
Week 14 – 23 Apr	Reflection class on what we learned this semester	

COVID-19 statement: Students should keep up-to-date on the university’s policies, practices, and mandates related to COVID-19 by regularly checking this website: <https://sites.google.com/alaska.edu/coronavirus/uaf/uaf-students?authuser=0> Further, students are expected to adhere to the university’s policies, practices, and mandates and are subject to disciplinary actions if they do not comply.

UA is an AA/EO employer and educational institution and prohibits illegal discrimination against any individual: <https://alaska.edu/nondiscrimination>.

APE: The Case for Strong Paragraph Development

Oftentimes, when writing, we are tempted to see the evidence itself as development but it's only a start. Consider a trial, where evidence is also central. In a trial no evidence is ever considered self evident--the lawyer has to...

- *Make a case for its introduction*
- *Explain why it's a legitimate evidence*
- *Examine it: Is it what it appears to be? Is it accurate? How else could it be explained?*
- *Link it to other evidence in a logical way that calls for guilt or innocence.*

In your essays, you need to find evidence, introduce it, explain it, and weave it into your big picture argument.

ASSERTION:

- The assertion (or topic sentence) states the specific arguable point you will make in the paragraph.
- Moreover, the assertion connects the paragraph to your thesis.
- Generally, assertions should go at the beginning of the paragraph (the first sentence, or, if there's a transition sentence, the second).
- Assertions must be arguable--the point that YOU are making about something.

PROOF:

- The examples are the evidence that supports (or "proves") your assertion.
- These could be a direct quote from the text, a detailed description of a visual object, data, etc.
- Examples should be introduced and briefly contextualized.

EXPLANATION:

- Examples NEVER speak for themselves: you must provide explanations, which clarify how and why the evidence relates to your assertion and subsequently your central claim.
- For instance, in a textual analysis, an explanation of a quote pulls out particular words, images, references, etc from the example and shows how these support the assertion.
- Explanation of examples and data outline the reasoning that logically links the evidence to the assertion.

You're not just summarizing, you are explaining the significance ...

- If you simply state, support and explain the assertions, your reader may respond with indifference unless you also tell them why they should care by showing the significance.
- Statements of significance anticipate and answer the question "So What?" In other words, why is the point made in the paragraph important in light of your thesis?
- Providing significance is crucial to making an argument that says something, has a purpose, or is interesting.