

**OCEAN 508/482 – THE CHANGING ARCTIC OCEAN - 2016**  
**WRITTEN ASSIGNMENT # 1**

**Electronic copy due by 5 pm Friday 29<sup>th</sup> April 2016 (week 5) via UW Canvas site.**

Submitted copy must be **.doc, or .docx**.

If concerned about formatting, email us a pdf file, too.

*Text should be 12 pt font and double spaced.*

*Length (not including figures, tables and references) is  
3 to 4 pages for undergraduates and 4 to 5 pages for graduates.*

This is an essay assignment, to include some literature review (reference list of at least 3 peer-reviewed journal papers for undergraduates and at least 6 peer-reviewed journal papers for graduates) and some thoughtful analysis. We encourage you to create an original graphic, flow diagram, table, etc., to help convey your analysis.

**ESSAY TOPIC: Interdisciplinary impacts of a seasonally ice-free Arctic.**

There is wide spread agreement that the extent and thickness of Arctic sea ice will continue to decrease into the future, with models predicting that within decades the Arctic will be seasonally ice-free. This new state implies (among other things):

- loss of multiyear ice;
- changes in the timing of sea-ice retreat/regrowth;
- absence of ice over the shelves and slopes during the sunlit seasons; and
- greatly increased areas of open water over slopes and basins.

In this assignment, we invite you to explore an interdisciplinary aspect of the Arctic Ocean that will be impacted by the Arctic being seasonally ice-free. Your essay should consider at least two disciplines – for example, changes in the physical system forcing biological responses or nutrient supply to the system, or feedbacks between disciplinary components. Focus your essay in a direction of your choosing. For example, you may wish to discuss what you think will be the largest, most dramatic, or most influential changes, or you may prefer to address an aspect you consider important or intriguing but perhaps less mainstream. You may focus at any scale – for example, on a particular organism or a whole ecosystem, on a local geographic region or the Arctic-wide scale. Where possible, try to quantify the magnitude of the specific effects that you discuss, even if it has to be a very rough quantification. If you cannot quantify it, discuss what information you would need to do so.

**GUIDELINES:**

**1) Title:** Present an informative and compelling title for your essay, which conveys the essence of the essay. “Seasonal sea ice and Arctic productivity” is an example of a poor title – it could mean anything. “A seasonally ice-free Arctic: the pros and cons for sea-ice algae” is a much better title, because the reader knows immediately what to expect.

**2) Layout:** Organize your text – do not let it ramble! Use subheadings to define sections of the essay. An example set of subheadings for this assignment is:

**a) Introduction or Background.** Here you explain the basic information on your topic that a reader would need to know to appreciate its importance.

**b) Subsections relating to your topic.** Here you break down your message into organized parts. For example, for the topic above, you might have three sections: Factors influencing ice-algal growth, Changes promoting ice-algal growth, Changes inhibiting ice-algal growth.

**c) Conclusions and/or Summary.** Here you get to summarize the main points of your essay and discuss the broader implications of your findings. This section provides a chance to highlight what you believe to be the most important findings and why.

**d) References.** List here all the sources referenced in your essay: the peer-reviewed journal articles and any additional sources you may have used. For each source, state briefly why you think the source is reliable. For each source, give full citation information, including a doi or weblink. If such a weblink is not available, email us a pdf of the article (or the relevant pages of a book) when you submit your essay. If you are unsure about the peer-reviewed status of a particular journal, ask us.

**3) Figures and tables:** Use figures and/or tables to illustrate science concepts. We encourage you to create an original graphic/table. If instead or in addition you use a figure or table from a paper or website, at the end of the caption indicate “Figure and caption reproduced from Smith et al., 2001” or “...from <http://...>”. In addition to proper accreditation, this approach allows the reader to clearly identify which illustrations were generated by others and which are your own work.

**4) References:** Cite articles you have used to develop your knowledge of the topic. Cite the source at the point where the information is used; e.g., “A comparison of ice-drift and Arctic atmospheric circulation patterns suggests that the state of the Arctic Oscillation (Thompson and Wallace, 1998) may explain recent thinning of Arctic sea ice (e.g., Rigor et al., 2002).” Cite the author(s) and year in the text (as per these two journals: *Journal of Geophysical Research* and *Polar Biology*), rather than using a number that refers to a numbered reference list (as per the journal *Nature*). When using material from a source, it is best to rephrase it in your own words. If, however, you wish to use the same words as the source, then you **MUST** put them in quotation marks, followed by the source in parentheses (e.g., author and date for a journal article), to avoid plagiarism. (If this is unclear to you, talk with us before submitting your essay, and we can explain/give examples of plagiarism.)

#### ***How to find peer-reviewed journal articles***

- You can start with the lectures, papers we cite, and papers we put on the class website. That gives a selection of journals and authors, but is not comprehensive.

- UW’s access to Web of Science is a great place to research. You can search for a topic, and get a list of relevant articles. You may also find Google Scholar to be useful.

If in doubt about the reliability of a journal, just ask us.

**Plan your essay:** We suggest that, after exploring the literature, you develop an outline of the main points and conclusions of your essay before you begin to write it. We are happy to discuss, in person or via email, these outlines with you in advance of the due date.

#### **YOUR OWN WORK:**

Be sure to properly credit the work of others. While you may discuss homeworks with your classmates and colleagues, the homework assignments must be your own original work. Make sure you cite published papers for ideas and results you have used from them, and use quotation marks (followed by the appropriate citation) to indicate material you have taken verbatim from a given source.