

## **NAO Research Report**

The North Atlantic Oscillation (NAO) Research Report is designed to demonstrate a working knowledge and understanding of the formation of the NAO and its impacts on weather, climate, environment, and economies. Students will utilize information gathered from the Internet to predict possible occurrences of the NAO in the future.

The NAO Research Report consists of the following –

- Student Directions
- Information Collection Chart
- Extension Questions
- Rubric

This collection of materials can be used in part or as a whole. Modification may be made depending on level of student achievement. This project may be completed individually or in groups.

To allow students a better understanding of what is expected, teachers may choose to copy the rubric on the back of the Student Direction paper.

Suggested Websites:

<http://eo.ucar.edu/spotlight/nao/index.html>

<http://www.ldeo.columbia.edu/res/pi/NAO/>

[http://earthobservatory.nasa.gov/Features/NAO/NAO\\_2.php](http://earthobservatory.nasa.gov/Features/NAO/NAO_2.php)

### **Georgia Performance Standards**

SM5. Students will differentiate the climates of Earth, how climate changes through time, and the theories regarding current climate change.

c. Evaluate the effects of El Nino-Southern Oscillation (ENSO) and the North Atlantic Oscillation (NAO) on climate.

d. Analyze current methods of climate prediction. (Predictions of ENSO, NAO, long-range outlooks, etc.)

Name \_\_\_\_\_

Class \_\_\_\_\_

## NAO Research Report Student Directions

Using the Internet, you are to research information pertaining to The North Atlantic Oscillation (NAO) phenomenon. Internet site suggestions are located below. Be certain to note which websites you take information from as you will create a bibliography.

Once your research is complete, you will compose a document that includes the following information –

- Conditions that produce the NAO.
- Effects on weather, environment, and economies of areas surrounding the Pacific Ocean
- Correlation between the NAO with the Earth's rotation and the Coriolis Effect
- Historic data
- Predictions on climatic effects

To complement the text, you will create either –

- PowerPoint Presentation of at least 6 slides (need to include at least 6 graphics/pictures/charts)
- Poster/ 3 Panel Poster of at least 6 graphics/pictures/charts with supporting textual documentation

To document the text, you will create a bibliography. See teacher for desired format.

To evaluate the work, a rubric has been developed. See teacher for copy.

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## NAO Information Collection

	Positive Index	Negative Index
Conditions for each index		
Environmental effects in Europe		
Weather effects in Europe		
Economical effects in Europe		
Environmental effects in Canada		
Weather effects in Canada		
Economical effects in Canada		
Environmental effects in North America		
Weather effects in North America		
Economical effects in North America		
Effects on North Atlantic hurricane activity		

## Extension Questions

Describe the conditions that cause the NAO to occur.

The NAO occurs only in the Atlantic Ocean. Explain in detail why this is so.

How does the occurrence of the NAO affect the formation of hurricanes in the Atlantic Ocean?

How does the NAO correlate with the Earth's rotation? the Coriolis Effect?

Which NAO index are we currently experiencing (or will experience soon). Explain your answer.

Research the dates of the most recent NAO indexes and write them below. A few have been filled in.

Positive Index	Negative Index
	2010
2004	

Based on this information, which index do you expect next year? Explain.

Based on this information, which state do you expect in 2 years? Explain.

Describe the climatic history behind the NAO.

How accurate are scientists able to predict the time and severity of the NAO?  
Describe.

Explain if there will ever be a time to accurately predict the exact nature and affects of the NAO on future climates. Clarify.

<http://eo.ucar.edu/spotlight/nao/index.html>

<http://www.ldeo.columbia.edu/res/pi/NAO/>

[http://earthobservatory.nasa.gov/Features/NAO/NAO\\_2.php](http://earthobservatory.nasa.gov/Features/NAO/NAO_2.php)

# Research Report : NAO

Student Name: \_\_\_\_\_

Date: \_\_\_\_\_ Class: \_\_\_\_\_

CATEGORY	4	3	2	1
<b>Research Paper - Quality of Information</b>	Information clearly relates to the main topic. It includes several supporting details and/or examples.	Information clearly relates to the main topic. It provides 1-2 supporting details and/or examples.	Information clearly relates to the main topic. No details and/or examples are given.	Information has little or nothing to do with the main topic.
<b>Research Paper - Amount of Information</b>	All topics are addressed and all questions answered with at least 2 sentences about each.	All topics are addressed and most questions answered with at least 2 sentences about each.	All topics are addressed, and most questions answered with 1 sentence about each.	One or more topics were not addressed.
<b>Research Paper - Sources</b>	All sources (information and graphics) are accurately documented in the desired format.	All sources (information and graphics) are accurately documented, but a few are not in the desired format.	All sources (information and graphics) are accurately documented, but many are not in the desired format.	Some sources are not accurately documented.
<b>PowerPoint/Poster - Mechanics</b>	No grammatical, spelling or punctuation errors.	Almost no grammatical, spelling or punctuation errors	A few grammatical spelling, or punctuation errors.	Many grammatical, spelling, or punctuation errors.
<b>Research Paper - Internet Use</b>	Successfully uses suggested internet links to find information and navigates within these sites easily without assistance.	Usually able to use suggested internet links to find information and navigates within these sites easily without assistance.	Occasionally able to use suggested internet links to find information and navigates within these sites easily without assistance.	Needs assistance or supervision to use suggested internet links and/or to navigate within these sites.
<b>PowerPoint/Poster - Content</b>	Diagrams and illustrations are neat, accurate and add to the reader's understanding of the topic.	Diagrams and illustrations are accurate and add to the reader's understanding of the topic.	Diagrams and illustrations are neat and accurate and sometimes add to the reader's understanding of the topic.	Diagrams and illustrations are not accurate OR do not add to the reader's understanding of the topic.
<b>PowerPoint/Poster - Mechanics</b>	No grammatical, spelling or punctuation errors.	Almost no grammatical, spelling or punctuation errors	A few grammatical spelling, or punctuation errors.	Many grammatical, spelling, or punctuation errors.
<b>PowerPoint/Poster - Organization and Neatness</b>	Information is very organized and neatly arranged; fonts/lettering are appealing and legible; decorations are quite tasteful and relate to topic	Information is organized and neatly arranged; fonts/lettering are appealing and legible; decorations are tasteful and relate to topic	Information is somewhat organized and somewhat arranged; fonts/lettering are fairly appealing and legible; decorations are tasteful and relate to topic	Information is very unorganized and is not neatly arranged; fonts/lettering are not appealing and not legible; decorations are not tasteful and do not relate to topic

Points \_\_\_\_\_ out of \_\_\_\_\_ GRADE \_\_\_\_\_ %

Comments \_\_\_\_\_  
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