POSSIBLE RESEARCH TOPICS

TOPIC	The information needs to be included about your topic.
Atmosphere	
Climate Change: Precipitation	● What is precipitation? ● Where does water from precipitation come from? ● What are global precipitation patterns? How do can they change? ● How is precipitation and heat related? ● How do atmospheric circulation patterns affect precipitation? ● What are possible technological solutions to reduce impact? ● How would one of these solutions reduce impacts on the atmosphere?
Climate Change: Temperature	● What is thermodynamics? ● What is vapor? ● How is water vapor related to temperatures ● How does the atmosphere trap heat? ● How does the earth receive heat energy from the sun? (reflection, absorption, scattering) ● What can cause temperatures to increase or decrease? ● How does the surface of Earth impact temperatures? (ex. Snow cover vs dark surface) ● What are possible technological solutions to reduce impact? ● How would one of these solutions reduce impacts on the atmosphere?
Climate Change: Atmospheric Composition (Greenhouse Gases)	● What gases make up our atmosphere? ● How do gases trap heat? ● What is the greenhouse effect? ● What are specific greenhouse gases? ● Where do greenhouse gases come from? (natural and man made) ● What solutions exists for limiting greenhouse gases or the impact they make on the environment? ● What are possible technological solutions to reduce impact? ● How would one of these solutions reduce impacts on the atmosphere?

Climate Change	● What is climate? ● How is climate different than weather? ● What is the history of Earth's climate? ● What things do we measure when looking at climate? ● What are things that change or impact the climate? ● How has human activity influenced the climate? ● How do we study changes/the history of climate? ● Why is climate change a more recent discussion? ● What are the potential impacts of a changing climate? ● What are possible technological solutions to reduce impact? ● How would one of these solutions reduce impacts on the atmosphere?
Air Quality: Smog	● What are the concentration of gases that make up the "air"? ● What is smog? ● How is sunlight related to smog? ● What is air quality? ● How do we measure air quality? ● What conditions make smog worse? ● Why is smog more common around cities? ● What climates are more likely to have smog? ● What are possible technological solutions? ● How would one of these solutions reduce impacts on the atmosphere?
Ozone Layer (Atmospheric Pollution: CFCs)	● What is the ozone layer? ● How does ozone form? ● What is the role of the ozone layer for earth? ● What would happen if we had less of an ozone or none at all? ● How does the ozone vary in different parts of the world? ● What are CFCs and where do they come from? ● How do CFCs deplete the ozone layer? ● How does ozone change in concentrations in the atmosphere? ● What are possible technological solutions to reduce impact? ● How would one of these solutions reduce impacts on the atmosphere?

Atmospheric Pollution: Factories	● What are are the normal gases found in the atmosphere? ● What is air quality? ● How do we measure air quality? ● What types of emissions can factories give off? (power plant vs. manufacturing) ● Are there any current regulations in place for factory emissions? ● How does factory pollution influence people outside of the region? (wind patterns) ● What are possible technological solutions to reduce impact? ● How would one of these solutions reduce impacts on the atmosphere?
Atmospheric Pollution	● What are are the normal gases found in the atmosphere? ● How do different gases pollute in different ways? ● Other than gases, what other pollutants to the atmosphere? ● What is air quality? ● How do we measure air quality? ● How does atmospheric pollution impact all people? ● What the the effects of atmospheric pollution? ● What are possible technological solutions to reduce impact? ● How would one of these solutions reduce impacts on the atmosphere?
Geosphere Topics	
Coral Reefs	● What are coral reefs? ● Why are coral reefs considered as the part of the geosphere? ● How do coral reefs shape the surface of Earth? ● What environmental conditions impact coral reefs? ● What would happen if coral reefs disappeared? ● What is coral bleaching? ● What are possible technological solutions to reduce impact? ● How would one of these solutions reduce impacts on the geosphere?

Mining Practices	● What materials are mined from the earth? ● What do we do with materials mined from earth? ● How does mining impact layers below the surface soil? ● How does mining impact the surrounding the area/environment? ● How is water influenced by mining? ● What are possible technological solutions to reduce impact? ● How would one of these solutions reduce impacts on the geosphere?
Mineral & Metal Recycling and Reuse	● What are minerals and metals? ● Where do minerals and metals come from? ● Why do we recycle or reuse minerals and metals? ● What are the benefits to recycling and reusing? ● What are the downfalls of recycling and reusing? ● Why was this technological solution developed? (what occuring in the environment made this solution be developed) ● How does this solution reduce impacts on the geosphere?
Fossil Fuel Resources	● What are fossil fuels? ● How are fossil fuels formed? ● How are different fuels separated from each other? ● How are fossil fuels removed from the ground? ● What are the hazards of getting fossil fuels out of the ground? ● What are the hazards of burning fossil fuels? ● What are possible technological solutions to reduce impact? ● How would one of these solutions reduce impacts on the geosphere?
Land Use: Agricultural Soil Loss	● What is agriculture? ● What are the common agricultural uses of land? ● What is the history of agriculture? (How is it different today than it use to be?) ● What is done to the land to prepare it for agricultural use? ● What are the chemical changes that happen when land is farmed? ● What are the impacts mass agriculture can have on its surround environment? ● Which earth systems can be impacted by mass ● What are possible technological solutions to reduce impact? ● How would one of these solutions reduce impacts on the geosphere?

Land Use: Urban Development	● What is urban development? ● What are the ways that urban development can impact the environment? ● What natural systems (other spheres) are influenced by Urban Development ● How is urban expansion directly related to climate? ● What are possible technological solutions to reduce impact? ● How would one of these solutions reduce impacts on the geosphere?
Nuclear Energy	● What is nuclear material? ● Where does nuclear material come from? ● How is the nuclear material extracted? ● What is energy? ● How do nuclear reactions produce energy? ● Why is uranium used? ● What is half life of uranium? ● What is the energy output of uranium? ● What are the hazards/dangers of using uranium to humans/environmental/animals? ● What are the pollutants given off? ● What are possible technological solutions to reduce impact? ● How would one of these solutions reduce impacts on the geosphere?
Renewable Energy: Hydroelectric Power	● What is Hydropower? ● What is a renewable energy source? ● What are the variety of ways hydropower is generated? ● Describe the hydropower in Maine. ● What is the history of hydropower? ● How is electricity generated from water? ● What are the benefits and the downfalls of hydropower? ● Why was this technological solution developed? (what occuring in the environment made this solution be developed) ● How does this solution reduce impacts on the geosphere?

Renewable Energy: Wind	● What is wind power? ● How is electricity generated from wind? ● What is a renewable energy source? ● Describe wind power in Maine. ● What is the history of wind power? ● What are the benefits and the downfalls of wind power? ● Why was this technological solution developed? (what occuring in the environment made this solution be developed) ● How does this solution reduce impacts on the geosphere?
Renewable Energy: Solar	● What is solar power? ● What is a renewable energy source? ● How is solar energy harnessed? ● How is electricity generated from solar? ● What are the benefits and the downfalls of solar power? ● What are the different scales (home vs. larger application) solar energy can be used? ● Why was this technological solution developed? (what occuring in the environment made this solution be developed) ● How does this solution reduce impacts on the geosphere?
Hydrosphere/Cryosphere Topics	
Freshwater (Drinking Availability)	● What are the sources of drinking water? ● How is drinking water retrieved from the ground? (multiple ways) ● How many people have access to clean drinking water vs people that do not? ● Why might drinking water not be available to all people? ● What are the problems with obtaining clean drinking water? ● What are creative ways people use to gain access to drinking water? ● What are possible technological solutions to reduce impact? ● How would one of these solutions reduce impacts on the hydrosphere?

Impact of Climate on Global Conveyor Belt	• What is the Global Conveyor Belt (GCB)? • How does density, salinity, and temperature play into the GCB? • What does the GCB do for the planet? • Why is the GCB important to the atmosphere and biosphere? • What is happening to the GCB? • What happens to the GCB when sea ice melts? • What would the impacts be if the GCB stopped working or changed from how it traditionally works? • Who studies the GCB? • What are possible technological solutions? • How would one of these solutions reduce impacts on the hydrosphere?
Ocean Water Acidification (pH)	• What is acidification and pH? • What things change the pH of the ocean? • In what ways does a change in pH affect the ocean? • Who studies and monitors the acidity of the ocean? • What are changes that we have already seen with the acidification of oceans? • What are possible technological solutions to reduce impact? • How would one of these solutions reduce impacts on the hydrosphere?
Ocean Temperature Changes	• What factors affect the temperature of the ocean? • How do the ocean and the atmosphere interact or affect each other? • What are the possible impacts of changing ocean temperatures (on the biosphere, geosphere, atmosphere)? • Who monitors and studies the temperature of the world's' oceans? • What are possible technological solutions to reduce impact? • How would one of these solutions reduce impacts on the hydrosphere?
Glacial Ice Volumes	• What are glaciers and where are they found? • How have glaciers changed over the last 100 years? • How do glaciers impact the biosphere, hydrosphere, and geosphere? • Who studies and monitors glaciers? • What are possible technological solutions to reduce impact? • How would one of these solutions reduce impacts on the hydrosphere?

Sea Level Changes	● What is sea level? ● How is sea level measured and monitored? ● How has sea level changed throughout history? ● What causes the sea to rise and fall? (list all potential causes) ● What are the impacts of a rising sea on the hydrosphere, geosphere, and biosphere? ● Who studies and monitors sea level changes? ● What are possible technological solutions to reduce impact? ● How would one of these solutions reduce impacts on the hydrosphere?
Water Pollution: Plastics	● What is plastic and how has it polluted the water? ● What is the evidence that shows plastic as a polluter? ● Where is pollution at its worst and why? ● How do plastics impact the atmosphere, geosphere, and biosphere? ● What are possible technological solutions to reduce impact? ● How would one of these solutions reduce impacts on the hydrosphere?
Water Pollution: Methylmercury	● What is Methylmercury? ● Where does mercury come from? ● How does Methylmercury make it into our environment? ● What are the harms of methylmercury? ● What are the impacts of methylmercury on the hydrosphere, atmosphere, biosphere, and geosphere? ● What are possible technological solutions to reduce impact? ● How would one of these solutions reduce impacts on the hydrosphere?
Reservoirs	● What is a reservoir and what is/are the purpose(s) of a reservoir? ● What is a dam and what is/are the purpose(s) of a dam? ● How do reservoirs impact the local land environment? ● How can reservoirs contribute to changes in earth's climate? ● How do reservoirs impact the biosphere, atmosphere, hydrosphere and geosphere? ● What are possible technological solutions to reduce impact? ● How would one of these solutions reduce impacts on the hydrosphere?

Water Pollution: Sewage	● What is sewage? ● Describe the systems typically used for disposing of waste ● What happens when sewage makes it into the environment? ● How does water pollution from sewage differ in places around the world? ● Why is treating sewage such a huge priority? ● How does sewage pollution impact the biosphere, atmosphere, hydrosphere and geosphere ● What are possible technological solutions to reduce impact? ● How would one of these solutions reduce impacts on the hydrosphere?