Ecosystems

Characteristics of the Arctic Biome

Section outline

Characteristics of the climate, plants, animals and soils of the Arctic tundra biome

Interrelationships between the climate, plants, animals and soils of the Arctic tundra biome

Characteristics of the biome

i. You should already have some information about the tundra biome from earlier lessons (including a nutrient-cycling diagram), but use the additional resources to create an A3 note-sheet with specific details about:

   Location, Climate, Plants, Animals, Soils

ii. Add details of the interrelationships between these different aspects of the biome.

iii. Find an example of a food web for an area within the Arctic – this needs to be terrestrial, though may include fresh- and/or salt-water organisms.

Now answer the following:

1. Is this a very biodiverse biome? Explain your answer.
2. Assess the importance of climate and soils in the development of this biome.
3. One of the resources states: “The tundra areas are…the most fragile and the youngest.” Provide evidence to justify these two assertions.

Ecosystems

Sustainable use of the Arctic Biome

Section outline

Threats to the Arctic tundra, including climate change, mineral exploitation and tourism

Conflicts with indigenous populations

Strategies used to manage the Arctic tundra biome

Threats to the Arctic Biome

Research the following:

- The impacts of climate change on the arctic biome (past, present and future): what, how and why
- Threats from mineral exploitation (most likely oil, but may be other minerals)
- Threats from tourism

Place-specific details are needed to support the points, so find examples of where these impacts are occurring and describe those, rather than going for general points

Remember you also have material from research on the impacts of human activity in glaciated landscapes (though not necessarily overlapping…)

Useful <u>starting</u> points:

Climate change: https://www.greenfacts.org/en/arctic-climate-change/

Mineral exploitation: research Arctic National Wildlife Refuge (ANWR), the 1002 lands and the Porcupine Caribou herd

Threats from tourism: http://news.bbc.co.uk/1/hi/sci/tech/1460339.stm

If you find examples of how the above conflict with indigenous people and/or offer sustainable solutions to using the arctic biome, then keep a note of them as they will be useful later

Threats to the Arctic Biome

Specialized Concepts for this unit:

causality (linked to changes due to human activity),

equilibrium and feedback (within ecosystems),

mitigation and sustainability (linked to management and conservation),

resilience (of native peoples),

risk (from local, regional and global threats),

systems (linked to their structure and functioning)

threshold (tipping points within ecosystems).

Impacts of climate change

How is the Arctic Tundra Biome affected by climate change?

Why?

How significant an issue is it? (consider different scales)

Ref to specialized concepts?

Specialized Concepts for this unit:

causality (linked to changes due to human activity),
equilibrium and feedback (within ecosystems),
mitigation and sustainability (linked to management and conservation),
resilience (of native peoples),
risk (from local, regional and global threats),
systems (linked to their structure and functioning)
threshold (tipping points within ecosystems).

Threats to the Arctic Biome

Mineral exploitation

Where's this happening?

Why is it a threat – how does/could it affect the biome, and why?

Ref to specialized concepts?

Specialized Concepts for this unit:

causality (linked to changes due to human activity),
equilibrium and feedback (within ecosystems),
mitigation and sustainability (linked to management and conservation),
resilience (of native peoples),
risk (from local, regional and global threats),
systems (linked to their structure and functioning)
threshold (tipping points within ecosystems).

Threats to the Arctic Biome

Tourism

Where's this happening?

Why is it a threat – how does/could it affect the biome, and why?

Ref to specialized concepts?

Specialized Concepts for this unit:

causality (linked to changes due to human activity),
equilibrium and feedback (within ecosystems),
mitigation and sustainability (linked to management and conservation),
resilience (of native peoples),
risk (from local, regional and global threats),
systems (linked to their structure and functioning)
threshold (tipping points within ecosystems).

Sustainable use of the Arctic Biome

Research the following:

- Conflicts with indigenous people: Who? Where? How? Why? Also consider:
  - How sustainable their traditional way of life is
  - The degree to which their traditional way of life gives them resilience to change
  - How this resilience is affected by developments from outsiders/newcomers
- Strategies to manage the biome – with respect to the threats identified previously (try to find at least **two** strategies). You should be able to evaluate these strategies in terms of economic, social and environmental sustainability. These can be just proposals…

You will need sufficient information to be able to write a good response to this essay:

To what extent is sustainable use of the Arctic biome possible? [45]

For some starting points see next page…

Sustainable use of the Arctic Biome

Some starting points:

http://refugeassociation.org/advocacy/refuge-issues/arctic/
http://www.ibtimes.co.uk/reindeer-could-save-arctic-tundra-vanishing-1637901
http://www.gwichinsteeringcommittee.org/
https://destinationthink.com/how-visit-greenland-makes-sustainable-tourism-priority/
https://www.iisd.org/sites/default/files/publications/greenland_sustainable_development.pdf
http://sites.nicholas.duke.edu/loribennear/2014/02/28/sustainable-arctic-offshore-drilling/
http://coldreality.org/2014/03/arctic-sustainability/
http://bellona.org/assets/sites/2/2015/12/Arktis-rapport-2015_lav.pdf
https://www.thearcticinstitute.org/arctic-future-sustainable-colonialism/
https://blogs.scientificamerican.com/guest-blog/the-arctic-paradox-poses-questions-about-sustainable-development/
https://www.sei-international.org/publications?pid=2776
http://staging.unep.org/gc/gc27/Docs/se/What%20Future%20for%20the%20Arctic.pdf
http://www.smithschool.ox.ac.uk/library/reports/ssee-arctic-forecasting-study-november-2011.pdf
http://www.atkearney.com.au/sustainability/featured-article/-/asset_publisher/Yo0mlusXSFXz/content/the-future-of-the-arct-1/10192?_101_INSTANCE_Yo0mlusXSFXz_redirect=%2Fsustainability