



FACT SHEET

The Science of Climate Change

What is 'climate change'?

Climate change refers to the increasing concentration of heat-trapping greenhouse gases (GHGs) in our atmosphere and resulting changes to the Earth's climate – most notably increasing air and water temperatures. Since the mid-1700s, the level of carbon dioxide in the atmosphere has risen 36 percent and methane levels have risen 148 percent. Global average air

temperature has risen by 0.6° C since 1900, and is projected to increase another 1.1° to 6.4° C over the next century.

What causes climate change?

Climate change is caused by the release of carbon dioxide and other GHG emissions into the atmosphere -- primarily the burning of fossil fuels and large-scale deforestation. The human cause of climate change has been endorsed by more than 40 scientific societies and academies of science, including all the national academies of science of the major developed countries.

What are the global impacts of climate change?

A change of even a few degrees in temperature destabilizes the delicate balance of the ecological systems on which humans rely. The global impacts of climate change include melting of the Arctic ice sheets, rising sea levels, species extinction, ecosystem disruption and loss, ocean acidification, severe weather events, and wider range of vector-borne diseases.

How will climate change impact the Islands Trust Area?

Coastal areas like the Islands Trust are particularly vulnerable to the effects of climate change. Local impacts are projected to include:

Freshwater Resources:

- Saltwater intrusion into coastal aquifers due to sea level rise
- Changes in groundwater recharge rates and water table depths
- Decrease in available potable water and increased competition for water (drinking, irrigation)
- Increased risk of drought and/or flooding
- Changes in water quality

Marine and Aquatic Ecosystems:

- Increased incidents of 'red tide'
- Invasion by exotic species
- Shifts in species range and distribution
- Loss of near-shore habitat due to sea level rise



Coastal Ecosystems + Infrastructure:

- Damage to buildings, property, and natural features due to sea level rise and storm surges
- Loss of coastal habitats due to sea level rise and erosion
- Increased costs for maintenance and expansion of coastal erosion control
- Loss of cultural and historical sites on coastline to sea level rise and related impacts

Biodiversity:

- Shifts in distribution and range of species
- Loss of species and habitat types not able to adapt to changing climate conditions
- Increased competition from invasive species
- Challenges to maintenance of biodiversity through current protected areas system due to species migration

Protected Areas:

- Increased impacts from natural hazards (wind storms, storm surges, droughts)
- Species migration, extinction and increasing competition from exotic species

Forests:

- Shift in the distribution and range of species
- Increased risk of pest outbreaks (e.g. pine beetle)
- Increased risk of forest fire
- Increased competition from invasive species

Agriculture:

- Changes in crop yield (will vary by crop) and growing conditions
- Increased demand for irrigation water due to longer and warmer growing season
- Increased risk of pest outbreaks and weeds
- Increased soil erosion
- Saline contamination of low-lying coastal agricultural lands

Energy:

- Reduced heating demands during winter months
- Increased cooling demand during summer months
- Increased or decreased hydroelectric generating capacity due to changes in streamflow

Transportation + Infrastructure:

- More travel disruptions associated with extreme weather events on ferry system
- More frequent landslides, road washouts and flooding
- Reduced effectiveness of seawalls with sea level rise and storm surges

Health:

- Increases in heat related stress, particularly among the young and elderly
- Increased vector-borne illness (e.g. West Nile)
- Reduced summer air quality in urban areas may impact island communities located near major urban centres