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DRAFT

What is Climate Change

The international climatology community has presented definitive evidence that the earth has experienced 30+ years of an increase in the average land and sea temperatures. A decade of change in the average temperature is accepted as the definition of climate change. Since the current change is an increase in the average temperature, it is accepted to be, by definition, global warming. In this context, the scientific community sees climate change and global warming as synonymous. The numerous potential causes of climate change, whether warming or cooling, fit into two general categories: natural and man-made.

In Truro, climate change means poorer air and water quality, warmer air and water temperatures, sea level rise, loss of natural habitat and animals, drought, flooding, wildfire risk, and impacts on health and the local economy.

What Causes Climate Change

Greenhouse gas emissions are the greatest source of climate change and global warming and come from the combustion of fossil fuels (oil, coal, and natural gas) that we use for heating, electricity, manufacturing, and travel. Carbon dioxide accounts for approximately 82% of all greenhouse gases, while methane, nitrous oxide, and fluorinated gases make up the rest. Greenhouse gas emissions stay in the Earth's atmosphere. As the sun heats the Earth, some of that heat is absorbed and some is released back into the atmosphere.

Climate change occurs because greenhouse gases, particularly carbon dioxide, absorb and radiate heat causing the Earth to warm up. Per National Oceanic and Atmospheric Administration (NOAA), emissions have increased by 41 percent from 1990 to 2017.

Impact

As the greenhouse gases trap heat, the atmosphere and oceans warm up. Warming causes more evaporation and precipitation, but not evenly. Some areas of the Earth face flooding while others face drought. Storms may become more frequent and more intense. As average temperatures increase, glaciers and ice packs melt. This, in turn, causes sea level to rise.

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Greenhouse gas emissions and the resulting warming temperatures impact all of us. For example:

- Heat waves, heavy downpours, and stronger storms compromise buildings, roads, agriculture, fisheries, and ecosystems.
- Sea level rise erodes our coastlines, an important source of income for Cape Cod.
- Hotter temperatures and air and water pollution affect our health and the health the plants and animals living in the land and ocean.

Effects of Climate Change in Truro

Increasing Land & Water Temperatures

- Risk to human health
- Risk to health of local flora and fauna
- Loss of native fish and shellfish
- Damage to infrastructure: roads, power lines, communications, etc.
- Damage farms and crops

More Violent Storms

- Property damage
- Risk to human safety
- Risk to local flora and fauna
- Loss of beaches and beach parking (revenue)
- Damage to infrastructure: roads, power lines, communications, etc.
- Damage farms and crops

Drought

- Risk to human health
- Risk to local flora and fauna health
- Damage farms and crops
- Increased risk of fires

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Sea Level Rise

- Risk to property (loss of tax revenues)
- Risk to potable water (intrusion of salt water)
- Risk to local flora and fauna habitat
- Damage farms and crops
- Risk to infrastructure: roads, power lines, etc.

Responding to Climate Change in Truro: Climate Action Plan

Describe the goal of this plan

Describe adaptation and mitigation

Emphasize collaboration among municipality, full- and part-time residents, and businesses.

Describe the intent & process of the plan (assess and recommend actions)

1. *Assess vulnerability/risk*
2. *Identify potential impact*
3. *Recommend actions to mitigate risks and/or adapt*
4. *Town-wide review/input*
5. *SB review and approval*
6. *Implement actions*

Methodology

1. *Develop a template to be used by each topic (goal, actions, measurement, etc.)*
2. *Identify team members for each topic (town department managers, committee/board, residents, businesses, etc.)*
3. *Identify goal*
4. *Identify actions*
5. *Identify method to measure or assess success*

Show in a flow chart

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Goal #1: Reduce GHG Emissions from New and Existing Buildings

Greenhouse gas emissions in Truro are largely generated from the use of fossil fuels. Fossil fuels in buildings – gasoline, propane, and oil – are used to heat buildings, heat water, and cook. GHG emigrating to electric heating and cooking as well as reducing heat and cooling loss from buildings.

Actions:	Assigned to:
Adopt the Massachusetts opt-in stretch code for Green Communities via warrant article in 2023 Annual Town Meeting.	EC and CAC

Goal #2: Reduce GHG Emissions from Waste Management/Reduce/Reuse/Recycle

The EPA estimates food waste is the single most common material in landfills and incinerated in the U.S. Food contributes to 24 percent of landfill waste and 22 percent of combusted municipal solid waste.

Solid waste contributes directly to greenhouse gas emissions through the generation of methane from the decay of waste in landfills and the emission of nitrous oxide from solid waste combustion facilities.

Actions:	Assigned to:
<ol style="list-style-type: none">1. Promote building materials reuse2. Reduce waste, including plastics and food3. Enhance recycling programs4. Educate on recycling	CAC? DPW?

Goal #3: Assess and Improve the Resilience of Buildings and Utilities

Sea level rise and increasing temperatures and severe weather threaten the stability of homes, commercial buildings, municipal buildings, roads, electric service, and cable services.

Actions:	Assigned to:
<ol style="list-style-type: none">1. Assess vulnerabilities in utility infrastructure2. Conduct vulnerability assessments of municipal facilities3. Participate in regional sediment management plans4. Recommend options for private property ownership in coastal hazard areas5. Improve stormwater management through culvert retrofits and other stormwater best management practices6. Assess low-lying roads and take appropriate action7. Water??8. Septic??	CAC? DPW? Conservation? Health?

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Goal #4: Reduce Emissions from Transportation

Describe transportation emissions

Actions:	Assigned to:
<ol style="list-style-type: none">1. Improve broadband access to reduce travel2. Support work from home policies3. Encourage carpooling and ride sharing4. Assess park-and-ride facility5. Expand and improve the bicyclist and pedestrian paths as alternate transportation modes6. Assess EV infrastructure and promote programs that incentivize EV adoption7. Electrify municipal vehicles and schoolbuses	<p>Cable & Internet Advisory Committee</p> <p>CAC Bike & Walkways Committee</p> <p>DPW</p>

Goal #5: Protect, Preserve, and Restore Natural Ecosystems

This supports carbon sequestration, reduces severity of wildfires, and xxx (expand on what each goal contributes)

Actions:	Assigned to:
<ol style="list-style-type: none">1. Maintain and increase parks and open spaces2. Quantify carbon sequestration by forests and wetlands3. Identify shade-starved areas and support tree planting programs4. Strategic planting of trees to provide building shading or cooling benefits5. Reforestation of disturbed areas6. Support forest management to protect healthy forests and reduce wildfire threat and severity	

Note: I deleted goal #7 re: protect agriculture & aquaculture. Could add it back as a research action.

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Goal #6: Improve Public Knowledge of Climate Change

Describe outreach and education; describe individual responsibilities/impact on Truro

Actions:	Assigned to:
<ol style="list-style-type: none">1. Develop curriculum and hands-on programming for students of all ages to become informed about climate change and the actions available to address it2. distribute the Climate Action Plan in print and other media3. Identify individual actions or lifestyle choices that individuals can take	CAC

Goal #7: Encourage the Production and Use of Clean Local Energy

Explain why this is important and how it ties to prior goals

Actions:	Assigned to:
<ol style="list-style-type: none">1. Facilitate renewable energy investment2. Use clean energy sources in municipal operations Encourage community solar and solar car ports3. Identify affordable renewable energy sources4. Support development of storage capability/battery technology5. Understand potential demand and capacity needs and plan for grid upgrades, consider decentralization	

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Goal #8: Ensure Human Health and Safety

Hotter summers are a risk to elderly, infants, those with health issues, low-income families, outdoor workers, and indoor workers without air cooling. Deaths result from heat stroke and related conditions, but also from cardiovascular disease, respiratory disease, and cerebrovascular disease. Heat waves are also associated with increased hospital admissions for cardiovascular, kidney, and respiratory disorders.

More violent storms, such as northeasters and hurricanes, put human health and safety at risk via loss of heat/cooling, access to potable water, access to health care, and damage to homes. The risks increase with prolonged power outages.

Actions:	Assigned to:
<ol style="list-style-type: none">1. Ensure heating and cooling shelters in the event of an extended power loss2. Ensure cooling centers during extended hot temperatures3. Educate about the effect of heat on humans4. ??Severe storms??5. ??Flooding??6. ??Wind damage??7. Wildfires??	

Goal #9: Assess Threat to Economic Viability of Truro

Potential Impact: Assess the potential loss of income to the municipality and to businesses due to climate change. This may include, but is not limited to:

- Loss of tax revenue: property & businesses
- Loss of beach parking
- Loss of tourist revenue
- Loss of successful farming
- Loss of aquaculture/fishing/shellfishing

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Recommended Actions: Identify all of Truro's revenue sources, including the municipality as well as commercial businesses. Something about concurrent scenarios for % loss of income from various income streams. This is a risk assessment

Actions:	Assigned to:
<ol style="list-style-type: none">1. Assess loss of tax revenues due to residential and commercial property loss (flood plain map)2. Assess loss of revenues due to loss of beaches3. Assess loss of revenues due to loss of shell and fin fishing (licenses, launch and mooring fees)4. Assess the impact of climate change on tourism	

Next Steps

Describe what happens over the next two years and then reassessment