

# Thurston Climate Adaptation Plan

## Risk Analysis Table

### Goal 1: Create vibrant centers, corridors, and neighborhoods while accommodating growth.

<b>High Consequence Risks</b>		<b>Likelihood</b>	<b>Stressor</b>	<b>Spatial Extent</b>	<b>Horizon</b>	<b>Confidence</b>	<b>Strategy</b>
<b>3</b>	Increases frequency, depth and duration of inundation of low coastal areas (e.g., downtown Olympia), which could damage or disrupt use infrastructure and result in loss of cultural resources (e.g., homes, roads, etc.)	High	Sea-level Rise	Place	0-10 years	High	Take Action
<b>Medium Consequence Risks</b>		<b>Likelihood</b>	<b>Stressor</b>	<b>Spatial Extent</b>	<b>Horizon</b>	<b>Confidence</b>	<b>Strategy</b>
<b>6</b>	Increases range and survival of pests and diseases that kill vegetation	High	Warmer Winter	Place	More than 30 years	High	Accept <i>Could also mitigate - increase use of insecticides, herbicides</i>
<b>1</b>	Makes it harder to balance competing demands for water (water available to support new urban development)	Low	Increasing Drought	Place	0-10 years	Low	Take Action <i>Transfer risk responsibility to either state or developers</i>
<b>Low Consequence Risks</b>		<b>Likelihood</b>	<b>Stressor</b>	<b>Spatial Extent</b>	<b>Horizon</b>	<b>Confidence</b>	<b>Strategy</b>
<b>4</b>	Causes urban heat islands, which could affect livability/health in heavily developed centers and corridors	Medium	Warmer Summer	Place	More than 30 years	Medium	Take Action <i>Could require more green space in new developments</i>
<b>5</b>	Stresses sensitive urban landscaping, which could leave them vulnerable to extreme heat, pests or pathogens	Medium	Increasing Drought	Place	0-10 years	Medium	Accept <i>Or could take action now and plant more hardy/resistant vegetation</i>

## Goal 2: Preserve environmentally sensitive lands, farmlands, forest lands, prairies, and rural lands and develop compact urban areas.

<b>High Consequence Risks</b>		<b>Likelihood</b>	<b>Stressor</b>	<b>Spatial Extent</b>	<b>Horizon</b>	<b>Confidence</b>	<b>Strategy</b>
<b>7</b>	Increases frequency and intensity of heaviest 24-hour rain events and overall volume of winter streamflow, which could degrade sensitive riparian areas	High	Intensifying Precipitation	Extensive	0-10 years	High	Take Action
<b>8</b>	Degrades critical habitat (lakes, rivers and streams) due to changes in water volume and temperature	High	Increasing Drought	Extensive	0-10 years	High	Take Action
<b>10</b>	Stresses sensitive plants and habitat, which could reduce long-term viability of preserved and restored areas	High	Increasing Drought	Extensive	0-10 years	High	Accept <i>Monitor and reassess later</i>
<b>12</b>	Increases frequency, depth and duration of inundation of low-lying coastal areas, which could turn marshes, estuaries and other upland areas into mudflats (dams limit sedimentation at Nisqually Delta)	High	Sea-level Rise	Place	0-10 years	Medium	Take Action <i>Transfer risk responsibility for lands owned by state or federal governments</i>
<b>13</b>	Stresses sensitive plants and habitat, which could leave them vulnerable to extreme heat, pests or pathogens	High	Warmer Summer	Extensive	0-10 years	High	Accept
<b>22</b>	Raises the risk of wildfires, which could damage forests and other sensitive lands that provide habitat	High	Increasing Drought	Place	10-30 years	High	Take Action

## Goal 2: Preserve environmentally sensitive lands, farmlands, forest lands, prairies, and rural lands and develop compact urban areas.

### Medium Consequence Risks

	Likelihood	Stressor	Spatial Extent	Horizon	Confidence	Strategy
<b>11</b> Degrades critical habitat (rivers and streams) due to greater winter runoff	High	Warmer Winter	Place	0-10 years	High	Take Action
<b>14</b> Causes salmon to remain active during winter	High	Warmer Winter	Extensive	10-30 years	Medium	Accept
<b>20</b> Increases wave action effects, which could degrade coastal habitat	High	Sea-level Rise	Extensive	10-30 years	Medium	Take Action <i>Or may accept and monitor risk instead ... How costly would it be to mitigate?</i>
<b>21</b> Alters stream volume	High	Intensifying Precipitation	Extensive	0-10 years	Medium	Take Action
<b>9</b> Increases pressure to develop rural areas, which could reduce, fragment and degrade them	Medium	Population Change	Extensive	0-10 years	Medium	Take Action <i>Transfer risk for lands owned by state or federal governments.</i>
<b>15</b> Decreases climatic suitability of areas that currently support Garry oak and prairie habitat	Medium	Warmer Summer	Extensive	More than 30 years	Medium	Accept
<b>16</b> Supports survival of invasive species (plants, insects) that could threaten native flora and fauna	Medium	Warmer Winter	Extensive	10-30 years	Medium	Take Action
<b>17</b> Degrades critical habitat (wetlands) due to changes in water volume and temperature	Medium	Increasing Drought	Extensive	10-30 years	High	Take Action
<b>18</b> Shifts the timing of flowering and abundance of pollinators, which could reduce some species of plants throughout the region	Medium	Warmer Winter	Extensive	0-10 years	Medium	Accept
<b>19</b> Expands range for invasive aquatic species	Medium	Warmer Water	Extensive	More than 30 years	Medium	Take Action <i>May have to transfer this risk to state and/or federal governments.</i>
<b>23</b> Increases pressure on existing parks and open space	Medium	Population Change	Extensive	10-30 years	Medium	Accept

**Goal 2: Preserve environmentally sensitive lands, farmlands, forest lands, prairies, and rural lands and develop compact urban areas.**

<b>139</b> Decreases climatic suitability of areas that currently support Douglas fir	Medium	Warmer Summer	Extensive	0-10 years	Medium	Accept
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### Goal 3: Create a robust economy through sustainable practices.

<b>High Consequence Risks</b>		<b>Likelihood</b>	<b>Stressor</b>	<b>Spatial Extent</b>	<b>Horizon</b>	<b>Confidence</b>	<b>Strategy</b>
<b>24</b>	Makes it harder to balance competing demands for water (water available to support new development)	High	Increasing Drought	Place	More than 30 years	Low	Take Action
<b>25</b>	Raises the risk of floods and landslides, which could damage private property and result in economic losses	High	Intensifying Precipitation	Site	0-10 years	High	Take Action
<b>26</b>	Threatens to flood low-lying industrial, commercial, agricultural, and residential properties, disrupt commerce and damage infrastructure (power, water, etc.)	High	Sea-level Rise	Place	10-30 years	High	Take Action
<b>27</b>	Raises the risk of floods and landslides, which could damage infrastructure (roads, utility lines, etc.) and cut off access to goods and services	High	Intensifying Precipitation	Extensive	0-10 years	High	Take Action <i>Transfer may also be an appropriate strategy, depending on the facility at risk</i>
<b>28</b>	Threatens to flood local highways, railways, bridges, port marine terminal and other transportation infrastructure that are critical to moving people and goods throughout the region	High	Sea-level Rise	Place	10-30 years	High	Take Action

### Goal 3: Create a robust economy through sustainable practices.

<b>Medium Consequence Risks</b>		<b>Likelihood</b>	<b>Stressor</b>	<b>Spatial Extent</b>	<b>Horizon</b>	<b>Confidence</b>	<b>Strategy</b>
<b>29</b>	Reduces summer hydropower production, a comparatively clean and inexpensive electricity source for commercial and residential customers	High	Increasing Drought	Extensive	More than 30 years	Medium	Take Action <i>Transfer risk reduction responsibility to Tacoma Power, which owns the Nisqually dam but provides power to Tacoma ratepayers.</i>
<b>30</b>	Increases volume of urban runoff and flooding, which could render inadequate some stormwater/flood-control facilities	High	Intensifying Precipitation	Place	0-10 years	High	Take Action
<b>31</b>	Raises the risk of floods and landslides, which could disrupt transportation, business, school, emergency service, and public works and private utility operations	High	Intensifying Precipitation	Place	0-10 years	High	Take Action
<b>32</b>	Raises the cost of new development and redevelopment	High	Sea-level Rise	Place	0-10 years	High	Take Action <i>Or could accept</i>
<b>43</b>	Raises the risk of floods and landslides, which could damage agricultural crops, buildings and equipment	High	Intensifying Precipitation	Place	0-10 years	High	Take Action
<b>33</b>	Raises the risk of wildfires which could damage forests that are important to the region's economy	Medium	Increasing Drought	Place	More than 30 years	Medium	Take Action <i>Transfer risk reduction responsibility to DNR and private landowners of working forests.</i>
<b>35</b>	Increases demand for and cost to provide services (social, emergency, etc.)	Medium	Population Change	Extensive	More than 30 years	Low	Accept <i>Monitor</i>
<b>36</b>	Puts more strain on transportation (roads, transit, etc.)	Medium	Population Change	Extensive	More than 30 years	Low	Take Action <i>Monitor</i>
<b>37</b>	Makes it harder to balance competing demands for water (water available for agriculture, industry and residential uses)	Medium	Increasing Drought	Place	0-10 years	High	Take Action
<b>50</b>	Raises the cost of development (flooding and runoff mitigation measures)	Low	Intensifying Precipitation	Site	0-10 years	Medium	Accept <i>Monitor impacts</i>

### Goal 3: Create a robust economy through sustainable practices.

<i>Low Consequence Risks</i>	Likelihood	Stressor	Spatial Extent	Horizon	Confidence	Strategy
38 Raises risk of low crop yields or failure due to warmer temperature, reduced summer precipitation and increased pest prevalence	High	Warmer Summer	Extensive	More than 30 years	Medium	Accept <i>Or "take action" by growing different crops that can better tolerate warmer temps, less water and pests.</i>
39 Thermally stresses salmonids, which support economically important fisheries	High	Warmer Water	Extensive	0-10 years	High	Take Action
40 Makes it harder to balance competing demands for water (water available for salmon fishery)	High	Increasing Drought	Extensive	0-10 years	High	Take Action
41 Reduces food available for and survival of salmon and other marine life	High	Ocean Acidification	Extensive	More than 30 years	Medium	Accept <i>Monitor impacts</i>
42 Reduces snowpack and alters stream volume and temperature, impacting long-term productivity of anadromous fish populations and fisheries	High	Warmer Winter	Extensive	More than 30 years	High	Accept <i>Monitor impacts</i>
45 Increases the risk of marine water stratification and hypoxia, which could alter the timing of spring plankton blooms that support the marine food web (including salmon and other economically important fish)	Medium	Warmer Water	Extensive	More than 30 years	Medium	Accept <i>Monitor impacts</i>
46 Rising temperatures increases risk for heat injuries which will increase demand/cost for emergency medical services and hospitalizations	Medium	Warmer Summer	Extensive	10-30 years	Medium	Take Action
47 Increases the rate of erosion of unprotected coastal bluffs, which could threaten the property and safety of nearby residents	Medium	Sea-level Rise	Site	More than 30 years	Medium	Take Action
51 Increases extreme heat events, which could result in project delays and increased costs (e.g., in the construction industry)	Low	Warmer Summer	Site	10-30 years	Low	Accept <i>Monitor impacts</i>

## Goal 4: Protect and improve water quality, including groundwater, rivers, streams, lakes, and the Puget Sound.

<b>High Consequence Risks</b>		<b>Likelihood</b>	<b>Stressor</b>	<b>Spatial Extent</b>	<b>Horizon</b>	<b>Confidence</b>	<b>Strategy</b>
<b>52</b>	Reduces groundwater recharge (drinking water and in-stream flows)	High	Increasing Drought	Place	0-10 years	Medium	Take Action
<b>54</b>	Increases water temperatures	High	Warmer Summer	Extensive	0-10 years	High	Take Action
<b>55</b>	Increases the growth and reach of pathogens (e.g., cyanobacteria and algal blooms) harmful to humans, fish and other water users	High	Warmer Water	Extensive	0-10 years	High	Take Action <i>Transfer risk action to other party (e.g., state or feds) where appropriate.</i>
<b>58</b>	Increases coastal flooding of downtown Olympia and LOTT wastewater treatment plant assets, which could threaten the ability to treat and discharge water	High	Sea-level Rise	Place	10-30 years	Medium	Take Action
<b>59</b>	Decreases in ocean pH, coupled with increases in ocean temperature and land-borne pollution, threatens marine water quality	High	Ocean Acidification	Extensive	0-10 years	Medium	Accept <i>Or could mitigate by reducing carbon emissions and polluted runoff</i>
<b>62</b>	Inundates former industrial sites, which could mobilize pollutants in the soil and degrade water quality	High	Sea-level Rise	Place	More than 30 years	High	Take Action
<b>56</b>	Increases concentration of pollutants in first-flush runoff	Medium	Increasing Drought	Place	10-30 years	Medium	Take Action
<b>57</b>	Contaminates water (turbidity and sedimentation) due to landslides	Medium	Intensifying Precipitation	Extensive	10-30 years	Medium	Take Action
<b>60</b>	Increases pollution related to development (e.g., more septic systems and impervious surfaces)	Low	Population Change	Extensive	More than 30 years	Low	Take Action



## Goal 4: Protect and improve water quality, including groundwater, rivers, streams, lakes, and the Puget Sound.

### Medium Consequence Risks

	Likelihood	Stressor	Spatial Extent	Horizon	Confidence	Strategy
<b>61</b> Contaminates water (nutrients) from septic systems due to high groundwater flooding	High	Intensifying Precipitation	Site	0-10 years	High	Take Action
<b>63</b> Contaminates water (bacteria, pathogens) due to a greater incidence of combined stormwater/sewer system overflows	High	Intensifying Precipitation	Place	10-30 years	Medium	Take Action
<b>64</b> Increases periods of low dissolved oxygen and hypoxic conditions in both freshwater and marine areas	Medium	Warmer Water	Extensive	10-30 years	Medium	Take Action <i>Similar to another goal 4 stressor/risk...</i>
<b>65</b> Increases pollution related to transportation (e.g., more automobiles)	Low	Population Change	Extensive	More than 30 years	Low	Take Action

### Low Consequence Risks

	Likelihood	Stressor	Spatial Extent	Horizon	Confidence	Strategy
<b>66</b> Contaminates water (turbidity and sedimentation) due to wildfires	Medium	Increasing Drought	Place	10-30 years	Medium	Accept <i>Monitor impacts</i>
<b>67</b> Increases recreational activity in waterbodies and risk of boat fuel spills	Low	Warmer Summer	Place	10-30 years	Low	Take Action <i>Transfer risk responsibility to state (Department of Ecology?).</i>

## Goal 5: Plan and act toward zero waste in the region.

### Medium Consequence Risks

	Likelihood	Stressor	Spatial Extent	Horizon	Confidence	Strategy
<b>69</b> Raises the risk of floods and landslides, which could damage public- and private-sector infrastructure (homes, businesses, roads, etc.) and create waste that cannot be reused or recycled	Medium	Intensifying Precipitation	Place	More than 30 years	Medium	Accept <i>Monitor impacts</i>

### Low Consequence Risks

	Likelihood	Stressor	Spatial Extent	Horizon	Confidence	Strategy
<b>68</b> Raises the risk of coastal inundation, which could damage public- and private-sector infrastructure (homes, businesses, roads, etc.) and create waste that cannot be reused or recycled	Medium	Sea-level Rise	Place	More than 30 years	Medium	Accept <i>Monitor impacts</i>
<b>71</b> Increases solid waste volume	Low	Population Change	Extensive	More than 30 years	Low	Take Action
<b>72</b> Increases use of parks, which could raise waste volume and disposal costs	Low	Warmer Summer	Site	More than 30 years	Low	Accept <i>Monitor impacts</i>
<b>74</b> Raises the risk of wildfires, which could damage public- and private-sector infrastructure (homes, businesses, roads, etc.) and create waste that cannot be reused or recycled	Low	Increasing Drought	Site	10-30 years	Medium	Accept <i>Monitor impacts</i>

## Goal 6: Ensure that residents have the resources to meet their daily needs.

<i>High Consequence Risks</i>	Likelihood	Stressor	Spatial Extent	Horizon	Confidence	Strategy
<b>75</b> Raises the risk of coastal inundation, which could damage public- and private-sector infrastructure (homes, businesses, roads, etc.)	High	Sea-level Rise	Extensive	10-30 years	High	Take Action
<b>76</b> Raises the risk of coastal inundation, which could cut off key routes that provide residents access to vital goods and services	High	Sea-level Rise	Extensive	10-30 years	High	Take Action
<b>81</b> Makes it harder to balance competing demands for water (reduces energy, water and food security)	High	Increasing Drought	Extensive	0-10 years	Medium	Take Action
<b>83</b> Makes it harder for calcifying organisms to form shells, and ultimately harms commercial and recreational shellfisheries	High	Ocean Acidification	Place	0-10 years	High	Take Action
<b>77</b> Increases demand for water (drinking, irrigation, etc.)	Medium	Population Change	Extensive	10-30 years	Medium	Take Action
<b>85</b> Shifts life cycle of fish and wildlife, which could reduce populations that support subsistence and recreational hunting	Medium	Warmer Winter	Extensive	0-10 years	Medium	Accept <i>Monitor impacts</i>
<b>87</b> Puts more strain on services (social, emergency, etc.)	Medium	Intensifying Precipitation	Extensive	0-10 years	Medium	Take Action

## Goal 6: Ensure that residents have the resources to meet their daily needs.

<i>Medium Consequence Risks</i>		Likelihood	Stressor	Spatial Extent	Horizon	Confidence	Strategy
78	Introduces or exacerbates disease vectors (carriers), which could harm human health (warmer, wetter winters also exacerbate exposure to pathogens and other health threats)	High	Warmer Summer	Extensive	0-10 years	Medium	Take Action
79	Threatens the survival of salmon, which support cultural and economic practices and ecosystem services	High	Warmer Water	Extensive	0-10 years	High	Take Action
82	Raises the risk of wildfires and elevated levels of PM10 from smoke	High	Increasing Drought	Extensive	0-10 years	High	Take Action
90	Puts more strain on services (social, emergency, etc.)	High	Population Change	Extensive	0-10 years	Low	Take Action
92	Increases extreme temperatures, which could cause hyperthermia -- a major risk for elderly, homeless and other especially vulnerable populations	High	Warmer Summer	Extensive	0-10 years	Medium	Take Action
80	Reduces aquifer recharge and could spur more groundwater pumping when surface water is scarce, which could lower well levels and raise the cost of pumping water from greater depths	Medium	Increasing Drought	Place	10-30 years	Medium	Take Action
84	Raises the risk of floods and landslides, which could cut off access to goods and services	Medium	Intensifying Precipitation	Place	0-10 years	Medium	Take Action
86	Raises the risk of floods and landslides, which could damage homes and businesses and cause personal injury or death	Medium	Intensifying Precipitation	Place	0-10 years	Medium	Take Action
88	Puts more strain on transportation (roads, transit, etc.)	Medium	Population Change	Extensive	10-30 years	Low	Take Action
89	Puts more strain on schools (e.g., unplanned influx or loss of students)	Medium	Population Change	Extensive	10-30 years	Low	Take Action

## Goal 6: Ensure that residents have the resources to meet their daily needs.

91	Increases summer peak energy demand for cooling residential and commercial buildings, which could place more demand on grid and reduce energy security	Medium	Warmer Summer	Extensive	0-10 years	High	Take Action <i>Risk responsibility for grid is PSE and its regulators. However, commercial and residential building owners can take action by boosting structures' energy efficiency and reducing dependence on the utility power (e.g., installing rooftop solar to meet needs).</i>
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### Low Consequence Risks

		Likelihood	Stressor	Spatial Extent	Horizon	Confidence	Strategy
93	Reduces snowpack that supports winter recreation activities	High	Warmer Winter	Site	10-30 years	High	Accept <i>Monitor impacts</i>
98	Reduces shoreline recreation opportunities	High	Sea-level Rise	Place	0-10 years	Low	Accept <i>Monitor impacts</i>
94	Raises the risk of wildfires, which could damage utility infrastructure	Medium	Increasing Drought	Place	0-10 years	Medium	Take Action
95	Raises the risk of wildfires, which could close roads and cut off access to vital goods and services	Medium	Increasing Drought	Place	0-10 years	Medium	Take Action
96	Parches farm fields and other open spaces, which could erode and release windblown dust (e.g., PM10) that degrades air quality	Medium	Increasing Drought	Place	10-30 years	Medium	Take Action
97	Raises home cooling costs (e.g., buying, installing, and using air-conditioning)	Medium	Warmer Summer	Extensive	10-30 years	Medium	Accept <i>Monitor impacts</i>
99	Raises the risk of wildfires, which could result in personal injury or death	Low	Increasing Drought	Place	0-10 years	Low	Take Action

## Goal 7: Support local food systems to increase community resilience, health, and economic prosperity.

### High Consequence Risks

	Likelihood	Stressor	Spatial Extent	Horizon	Confidence	Strategy
<b>101</b> Makes it harder to balance competing demands for water (reduces water available to junior water right holders, threatening the survival of livestock and crops for farmers)	High	Increasing Drought	Extensive	0-10 years	High	Take Action
<b>102</b> Threatens the survival of salmon, which support cultural and economic practices and ecosystem services	High	Warmer Water	Extensive	0-10 years	High	Take Action
<b>103</b> Makes it harder for calcifying organisms to form shells, and ultimately harms commercial and recreational fisheries	High	Ocean Acidification	Extensive	0-10 years	High	Take Action
<b>104</b> Reduces food available for and survival of salmon and other marine life	High	Ocean Acidification	Extensive	10-30 years	Medium	Accept <i>Monitor impacts</i>

### Medium Consequence Risks

	Likelihood	Stressor	Spatial Extent	Horizon	Confidence	Strategy
<b>105</b> Raises the risk of lower crop yield or failure	Medium	Increasing Drought	Extensive	10-30 years	Medium	Take Action
<b>106</b> Increases range and survival of pests and diseases that affect crops	Medium	Warmer Winter	Extensive	10-30 years	High	Take Action
<b>107</b> Accelerates risk of food spoilage before it reaches market	Medium	Warmer Summer	Extensive	10-30 years	Low	Take Action <i>Potential actions include creating better bulk refrigeration, storage and distribution infrastructure in Thurston County.</i>

## Goal 7: Support local food systems to increase community resilience, health, and economic prosperity.

<b>Low Consequence Risks</b>	<b>Likelihood</b>	<b>Stressor</b>	<b>Spatial Extent</b>	<b>Horizon</b>	<b>Confidence</b>	<b>Strategy</b>
<b>108</b> Increases risk of flooding that could damage agricultural lands and assets (crops and livestock)	High	Intensifying Precipitation	Place	0-10 years	Medium	Take Action
<b>109</b> Pushes saltwater farther into estuaries, which may inundate near-coastal farms and ranches	High	Sea-level Rise	Site	10-30 years	Medium	Accept <i>Monitor impacts</i>
<b>111</b> Increases in atmospheric CO2 decreases the nutritional quality of forage and pasture lands for livestock and wild animals	Medium	Warmer Summer	Extensive	10-30 years	Medium	Accept <i>Monitor impacts</i>
<b>112</b> Turns coastal marshes and forests into mudflats that alters nesting habitat	Medium	Sea-level Rise	Place	10-30 years	Low	Accept <i>Monitor impacts</i>
<b>110</b> Increases heat stress risk for dairy cows and other large livestock	Low	Warmer Summer	Place	10-30 years	Medium	Accept <i>Monitor impacts</i>
<b>113</b> Increases pressure to develop rural areas, which could reduce, fragment and/or degrade agricultural lands	Low	Population Change	Extensive	10-30 years	Low	Accept <i>Monitor impacts</i>

## Goal 8: Ensure that the region's water supply sustains people in perpetuity while protecting the environment.

### High Consequence Risks

	Likelihood	Stressor	Spatial Extent	Horizon	Confidence	Strategy
<b>114</b> Makes coastal groundwater more vulnerable to saltwater intrusion and inundation	High	Sea-level Rise	Place	10-30 years	High	Take Action
<b>115</b> Makes it harder to balance competing demands for water (all uses)	Medium	Increasing Drought	Extensive	10-30 years	Medium	Take Action
<b>116</b> Raises pollutant concentrations in shallow wells and surface waters	Low	Increasing Drought	Extensive	10-30 years	Low	Take Action
<b>117</b> Makes it harder to balance competing demands for water (all uses)	Low	Population Change	Extensive	0-10 years	High	Take Action

### Low Consequence Risks

	Likelihood	Stressor	Spatial Extent	Horizon	Confidence	Strategy
<b>118</b> Increases plant transpiration (root uptake and leaf release of water) during winter months, which could lower water table.	Low	Warmer Winter	Extensive	More than 30 years	Low	Accept
<b>119</b> Increases volume of urban runoff and flooding, which decrease groundwater recharge	Low	Intensifying Precipitation	Extensive	0-10 years	Low	Take Action



## Goal 9: Move toward a carbon-neutral community.

### High Consequence Risks

	Likelihood	Stressor	Spatial Extent	Horizon	Confidence	Strategy
<b>120</b> Increases summer peak energy demand for cooling residential and commercial buildings, which — depending on the energy source — may increase carbon emissions	Medium	Warmer Summer	Extensive	0-10 years	Medium	Take Action

### Medium Consequence Risks

	Likelihood	Stressor	Spatial Extent	Horizon	Confidence	Strategy
<b>121</b> Increases overall energy consumption (transportation, buildings, waste, etc.)	Medium	Population Change	Extensive	10-30 years	Medium	Take Action

### Low Consequence Risks

	Likelihood	Stressor	Spatial Extent	Horizon	Confidence	Strategy
<b>122</b> Raises the risk of wildfires, which could destroy forests that serve as a net carbon sink	High	Increasing Drought	Place	0-10 years	Medium	Accept <i>Monitor impacts</i>
<b>123</b> Causes erosion and loss of organic materials (e.g., plants) that build up in reservoirs (e.g., Alder Lake), decay and emit greenhouse gases (e.g., methane)	High	Intensifying Precipitation	Site	0-10 years	Low	Accept <i>Monitor impacts</i>
<b>124</b> Accelerates release of carbon stored in soils	Medium	Warmer Summer	Extensive	0-10 years	Medium	Accept
<b>125</b> Lowers reservoir levels, which exposes organic materials and causes them to decay and emit greenhouse gases	Medium	Increasing Drought	Site	0-10 years	Low	Accept
<b>126</b> Increases energy consumed to pump wastewater and stormwater	Medium	Sea-level Rise	Place	10-30 years	High	Accept
<b>129</b> Necessitates moving water farther distances, which consumes more energy/causes more greenhouse gas emissions	Low	Increasing Drought	Extensive	10-30 years	Medium	Accept

## Goal 10: Maintain air quality standards.

### High Consequence Risks

	Likelihood	Stressor	Spatial Extent	Horizon	Confidence	Strategy
<b>131</b> Increases transportation-related energy consumption and pollution	Low	Population Change	Extensive	More than 30 years	Low	Take Action

### Medium Consequence Risks

	Likelihood	Stressor	Spatial Extent	Horizon	Confidence	Strategy
<b>132</b> Increases production of surface ozone (VOCs interacting with NOx) and accumulation of fine particulate matter (PM2.5)	Medium	Warmer Summer	Extensive	0-10 years	Medium	Take Action
<b>133</b> Raises the risk of wildfires and elevated levels of PM10 from smoke	Medium	Increasing Drought	Extensive	10-30 years	Medium	Take Action

### Low Consequence Risks

	Likelihood	Stressor	Spatial Extent	Horizon	Confidence	Strategy
<b>135</b> Parches farm fields and other open spaces, which could erode and release windblown dust (e.g., PM10) that degrades air quality	Low	Increasing Drought	Place	10-30 years	Medium	Take Action
<b>136</b> Increases use of polluting generators following storm-induced power outages	Low	Intensifying Precipitation	Extensive	0-10 years	Low	Accept

## Goal 12: Make strategic decisions and investments to advance sustainability regionally.

### *Medium Consequence Risks*

	Likelihood	Stressor	Spatial Extent	Horizon	Confidence	Strategy
<b>137</b> Makes it harder to balance competing demands for water (all uses)	High	Increasing Drought	Extensive	0-10 years	High	Take Action
<b>138</b> Necessitates retrofitting stormwater and wastewater infrastructure to mitigate flooding and backups that threaten water quality and human health and welfare	High	Intensifying Precipitation	Place	0-10 years	High	Take Action