

CLIMATE *Friendly* PARKS

San Juan Island National Historical Park Action Plan

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SAN JUAN ISLAND NATIONAL HISTORICAL PARK BECOMES A CLIMATE FRIENDLY PARK

As a participant in the Climate Friendly Parks program, San Juan Island National Historical Park belongs to a network of parks nationwide that are putting climate friendly behavior at the forefront of sustainability planning. By conducting an emission inventory, setting an emission reduction goal, developing this Action Plan, and committing to educate park staff, visitors, and community members about climate change, San Juan Island National Historical Park provides a model for climate friendly behavior within the park service.

This Action Plan identifies steps that San Juan Island National Historical Park can undertake to reduce GHG emissions to mitigate its impact on climate change. The plan presents the Park's emission reduction goals, and associated reduction actions to achieve the Park's goals. Strategies and action plan items were developed by working groups at the North Coast & Cascade and Upper Columbia Basin Climate Friendly Parks Workshop.¹ While the plan provides a framework needed to meet the park's emission reduction, it is not intended to provide detailed instructions on how to implement each of the proposed measures. The park's Environmental Management System will describe priorities and details to implement these actions. The park's Environmental Management Plan already contains objectives of reducing or eliminating pesticide use, hazardous material, and solid waste and calls for increasing the use of environmentally-friendly products and recycling.

San Juan Island National Historical Park intends to:

- Reduce 2007 energy GHG emissions from park operations by 10 percent by 2016.
- Reduce 2007 transportation GHG emissions from park operations by 20 percent by 2016.
- Reduce 2007 waste GHG emissions from park operations through waste diversion and reduction by 10 percent by 2016.
- Reduce total 2007 park GHG emissions, including concessioners, by 5 percent by 2016.

To meet these goals, the park will implement strategies proposed in this plan that relate to the Park's current and future emission inventories. Specifically, the plan recommends three strategies:

Strategy 1: Identify and implement mitigation actions that the park can independently take to reduce GHG emissions resulting from activities within and by the park.

Strategy 2: Increase climate change education and outreach efforts.

Strategy 3: Monitor progress with respect to reducing emissions and identify areas for improvement.

THE CHALLENGE OF CLIMATE CHANGE

Climate change presents significant risks and challenges to the National Park Service and specifically to San Juan Island National Historical Park. Scientists cannot predict with certainty the general severity of climate change nor its impacts. Average global temperatures on the Earth's surface have increased about 1.1°F since the late 19th century, and the 10 warmest years of the 20th century all occurred in the last 15 years. The single leading cause of this warming is the buildup of GHGs in the atmosphere—primarily carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O)—which trap heat that otherwise would be released into space.

¹ Original notes from these workshops, including detailed action items not presented in the final plan have been archived by San Juan Island National Historic Park and are available upon request.

The continued addition of CO₂ and other GHGs to the atmosphere will raise the Earth's average temperature more rapidly in the next century; a global average warming of 4-7°F by the year 2100 is considered likely.² Rising global temperatures will further raise sea levels and affect all aspects of the water cycle, including snow cover, mountain glaciers, spring runoff, water temperature, and aquatic life. Climate change is also expected to affect human health, crop production, animal and plant habitats, and many other features of our natural and managed environments.

At San Juan Island National Historical Park, increasing temperatures, and changing precipitation patterns may alter park ecosystems, changing vegetation communities, habitats available for species, and the experience of park visitors. Much of English Camp, one of two units that make up San Juan Island National Historical Park, lies three to six feet above sea level. One of the historical buildings there already gets hit by high tides at the base of the building. Also affected would be the six miles of shoreline within park boundaries.

GREENHOUSE GAS EMISSION INVENTORY AT SAN JUAN ISLAND NATIONAL HISTORICAL PARK

Naturally occurring GHGs include CO₂, CH₄, N₂O, and water vapor. Human activities (e.g., fuel combustion and waste generation) lead to increased concentrations of these gases (except water vapor) in the atmosphere.

Greenhouse Gas Emissions

GHG emissions result from the combustion of fossil fuels for transportation and energy (e.g., boilers, electricity generation), the decomposition of waste and other organic matter, and the volatilization or release of gases from various other sources (e.g., fertilizers and refrigerants).

San Juan Island National Historical Park is relatively small with few sources of greenhouse gases besides those resulting from transportation as seen in the figures below. There are three occupied buildings that use energy with the predominate use being for heat. One of those buildings is an out-dated, environmentally "unfriendly" visitor center, which is a double-wide mobile home that was brought to the park in 1979 to serve as a temporary structure. Its electrical system and insulation are not up to code. It is framed with "2 by 4's" so the insulation cannot be thick enough to be adequate. Because of the building's age and construction, it is not worth the cost to upgrade.

In 2007, GHG emissions within San Juan Island National Historical Park totaled 289 metric tons of carbon dioxide equivalents (MTCO₂E). This includes emissions from park and concessioner operations and visitor activities, including vehicle use within the park. For perspective, a typical single family home in the U.S. produces approximately 12 MTCO₂ per year.³ Thus, the combined emissions from park and concessioner operations and visitor activities within the park are roughly equivalent to the emissions from the electricity use of 25 households each year.

The largest emission sector for San Juan Island National Historic Park is transportation, totaling 253 MTCO₂E (see Figure 1 and Table 1). The park is made up of two units that are 13 miles apart from each other and 7 and 9 miles from the ferry landing in town. Visitors to the park have a ways to go to reach the park once they get to the island. Fortunately there are sights along the way and in between which enable multi-purpose trips. The park encourages the county-run summer shuttle to stop at both park units on a regular basis in order to provide visitors with an alternative mode of transportation. Park employees plan their trips carefully so as to limit driving between the two units. Park headquarters personnel are leasing a hybrid vehicle.

² IPCC 2007. Climate Change 2007: The Physical Science Basis. Intergovernmental Panel on Climate Change, Geneva Switzerland. Available online at < <http://ipcc-wg1.ucar.edu/wg1/wg1-report.html>>

³ U.S. EPA, Greenhouse Gases Equivalencies Calculators – Calculations and References, Retrieved , Website: <http://www.epa.gov/RDEE/energy-resources/calculator.html>

FIGURE 1

San Juan Island National Historical Park 2007 Total Greenhouse Gas Emissions by Sector

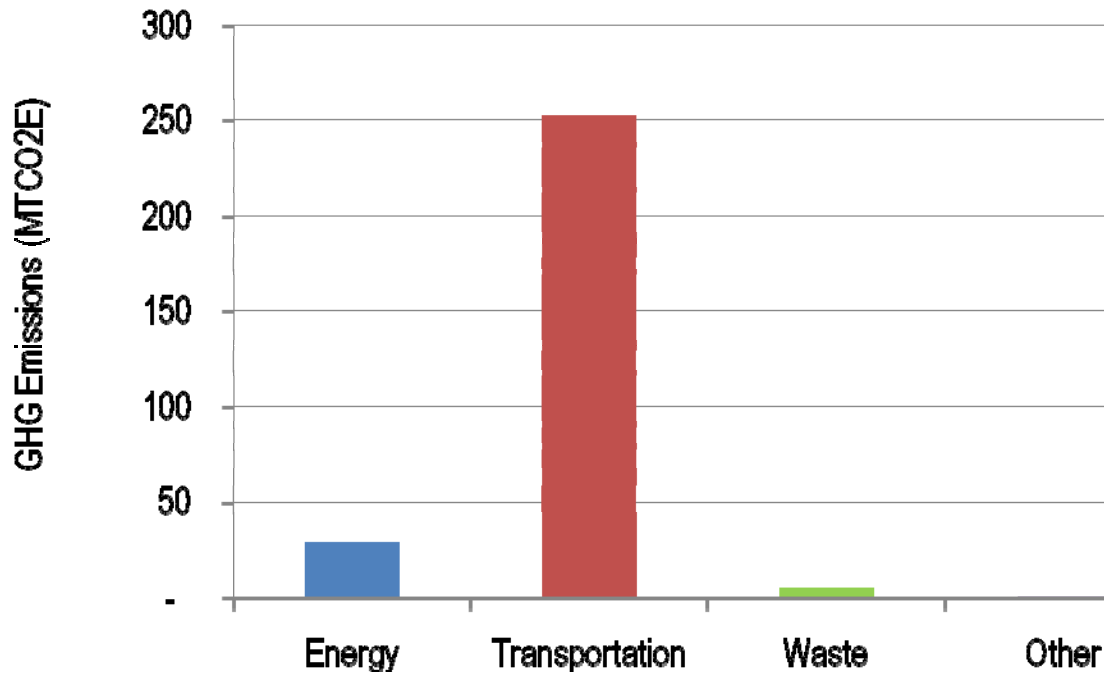


TABLE 1

San Juan Island National Historical Park 2007 Total Greenhouse Gas Emissions by Sector and Source

	MTCO2E
Energy	29
Stationary Combustion	4
Purchased Electricity	26
Transportation	253
Mobile Combustion	253
Waste	6
Landfilled Waste	6
Wastewater	0
Other	1
Refrigeration and Air Conditioning	1
Total	289

Note - Totals may not sum due to rounding
 Not applicable data sources represented by "-"

FIGURE 2

San Juan Island National Historical Park 2007 Park Operations Emissions by Sector

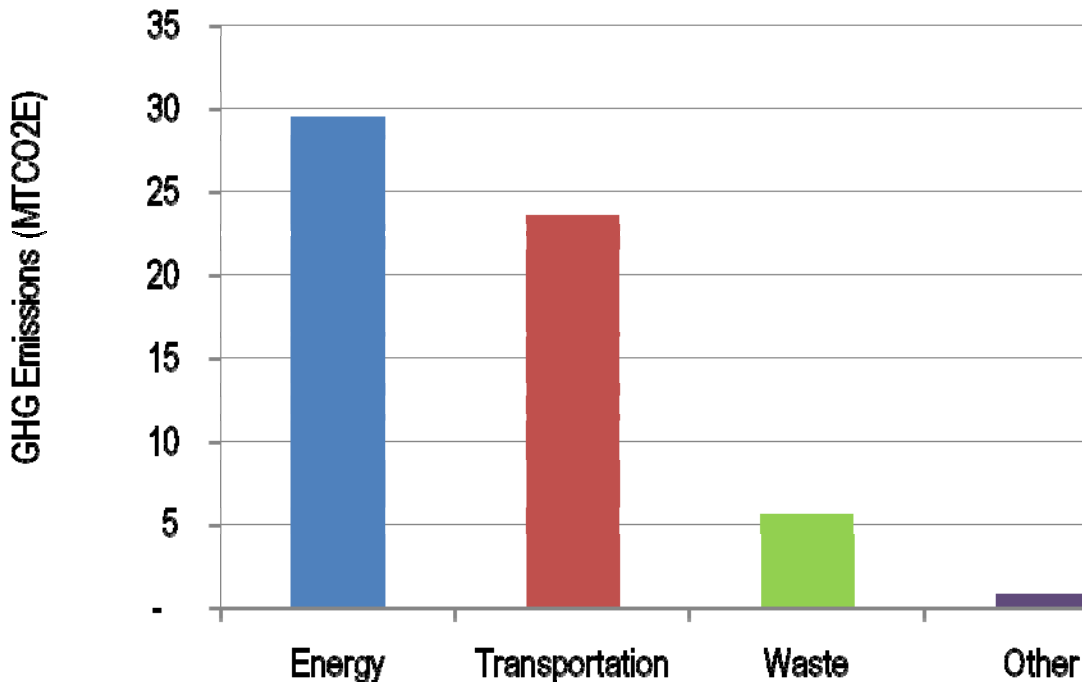


TABLE 2

San Juan Island National Historical Park 2007 Park Operations Emissions by Sector

	MTCO2E
Energy	29
Stationary Combustion	4
Purchased Electricity	26
Transportation	24
Mobile Combustion	24
Waste	6
Landfilled Waste	6
Wastewater	0
Other	1
Refrigeration and Air Conditioning	1
Total	60

Note - Totals may not sum due to rounding
Not applicable data sources represented by "-"

San Juan Island National Historical Park Responds to Climate Change

The following actions were developed during the North Coast & Cascade and Upper Columbia Basin Climate Friendly Parks Workshop on February 9th and 10th, 2010, in order to meet the park's climate change mitigation goals.

STRATEGY 1: REDUCE GHG EMISSIONS RESULTING FROM ACTIVITIES WITHIN AND BY THE PARK

San Juan Island National Historical Park has developed a set of actions that the park is committed to taking in order to reduce emissions from activities within and by the park. These strategies have been prioritized based on a qualitative assessment of a set of criteria including: emission reduction potential, cost-effectiveness, feasibility, co-benefits, regional impact, and ability to rapidly implement. Actions that San Juan Island National Historical Park will take have been presented below in order from highest to lowest priority within each sub-category.

Energy Use Management

Emission Reduction Goal: Reduce 2007 energy GHG emissions from park operations by 10 percent by 2016.

Improving energy efficiency and implementing alternative energy sources reduces park-based fuel use, lowers GHG emissions, decreases electricity consumption, and offers monetary benefits for the park. Emissions inventory results indicate that 10 percent of the park's GHG emissions from Park Operations are from energy consumption. San Juan Island National Historical Park has identified actions it will take to reduce energy-related emissions. Presented below are the actions that are currently under way and which comprise the park's progress to date, as well as those actions the park will pursue.

Progress to Date

- Transition to energy efficient electronics.
- Photo sensitive light switches have been installed at the visitor center.
- Programmable thermostats are installed at all buildings
- A photovoltaic system has been installed off-site which produces enough kilowatts to cover 15 – 20% of the park's electrical use.
- CFL's have been installed in many locations

Energy Use Management – Planned Actions

1 Promote energy efficiency and energy conservation in the park through behavioral change

- Encourage energy conservation in all park activities.
- Develop a mandatory energy-saving training program.
- Ensure all computers' power management settings follow current ENERGY STAR recommendations.

2 Upgrade lighting options

- Upgrade all light fixtures and bulbs in park to energy efficient bulbs.



3 Switch to more efficient electronics and devices

- Default all computers to print double-sided.
- Install Smart Strip power strips.
- Purchase only energy efficient electronics.

4 Improve building structures and envelopes

- Weatherize park buildings by adding R-values to improve insulation effectiveness.

5 Utilize alternative energy sources

6 Measure energy use throughout the park

- Incorporate energy efficiency criteria into new contracts for park and concessioner construction.
- Conduct an energy audit for all park buildings. Partner with local utilities to conduct the audit.
- Review and implement the DOI Sustainable Buildings Implementation Plan.

Transportation Management

Emission Reduction Goal: Reduce 2007 transportation GHG emissions from park operations by 20 percent by 2016.

Reducing vehicle miles traveled, improving vehicle efficiency, and using alternative fuels can significantly reduce San Juan Island National Historical Park's emissions. As the inventory results indicate, GHG emissions from transportation comprise 40 percent of park operations emissions and 88 percent of the park's overall emissions (including visitors). Accordingly, in addition to the park operations emissions reduction goal, San Juan Island National Historical Park set a goal to reduce overall transportation emissions by 10% percent below 2007 levels by 2016. Presented below are the actions that are currently under way and which comprise the park's progress to date, as well as those actions that the park will pursue.

Progress to Date

- Encourage visitors to use a shuttle bus service during the high season.
- Schedules of shuttle buses are posted in the park at shuttle stops.
- Maintenance fleet has been reduced from 4 trucks to 3 trucks in the summer season.
- A hybrid vehicle is being leased as one of the park's fleet.



Transportation Management – Planned Actions

1 Transportation-related behavioral changes

- Prohibit visitor vehicle idling.
- Encourage staff carpooling.
- Reduce staff idling.

2 Reduce visitor vehicle fuel consumption

- Partner with surrounding state and local communities on alternative transportation opportunities for visitors.
- Improve tracking of visitor transit data.
- Broaden road shoulders to encourage bicycle transportation.
- Create trail connections with county trails committee to encourage hiking to the park.

3 Reduce NPS vehicle and equipment fuel consumption

- Analyze fleet fuel-consumption patterns for efficiency improvements.
- Promote efficient driving.

4 Replace NPS vehicles and equipment

- Incorporate alternative fuel guidelines into fleet specifications.

5 Improve vehicle maintenance procedures

- Use biobased lubricants and greases.

Waste Management

Emission Reduction Goal: Reduce 2007 waste GHG emissions from park operations through waste diversion and reduction by 10 percent by 2016.

The connection between waste and GHG emissions may not be obvious. However, waste management—in the form of source and solid waste reduction—can dramatically reduce GHG emissions. Landfills are the largest human-generated source of CH₄ emissions in the United States. Reducing the amount of waste sent to landfills reduces CH₄ emissions caused by decomposition as well as the GHGs emitted from the transportation of waste. The less the park and its visitors consume in terms of products and packaging, the less energy is used and fewer GHGs are emitted.

San Juan Island National Historical Park's park operation activities emitted 6 MTCO₂E from waste management in 2007. By diverting or reducing the park's waste stream through increased recycling efforts and waste management the park will reduce the amount of waste sent to landfills and resulting emissions. Presented below are the actions that are currently under way and which comprise the park's progress to date as well as those actions that the park will pursue.

Progress to Date

- Easy-to-use recycling containers installed throughout park facilities.
- We send used florescent bulbs to reclaim/recycle service center.
- We have instituted alkaline, lithium battery recycling locations in every office building
- We recycle old computers and electronics.
- We salvage construction materials when feasible.
- We have inventoried and substituted cleaning supplies with non-toxic products.

Waste Management – Planned Actions

1 Decrease waste through behavior change

- Require that construction contractors reuse or recycle materials used during building renovations and new site construction/remodeling projects.
- Engage staff to reduce and manage waste at work.
- Train park staff and contractors on waste reduction responsibilities.
- Train maintenance staff on waste reduction initiatives.
- Train custodial staff in most efficient use of cleaning products.

2 Establish new plans and policies that promote waste reduction.

- Measure baseline solid waste generation (tons).
- Measure, track, and report waste stream data (include landfill waste and recycled waste) to monitor reductions and success in diverting waste from the landfill.

3 Implement recycling and composting practices

- Continually increase the amount of waste material at the park that can be recycled.
- Practice Environmentally Responsible Deconstruction.

4 Reduce waste through green procurement

- Evaluate current purchases and reduce redundant products.
- Use post-consumer recycled paper in all park publications.
- Train staff on green procurement practices.
- Continually increase the recycled content of purchased materials.
- Adhere to Federal, NPS, and PWR Guidance for Procurement.
- Implement petroleum product substitution program.
- Use low/no-VOC insulation, carpets, paints, and adhesives.
- Increase the use of biobased products.
- Use carpet with high recycled content for any building projects.
- Promote the use of recycled content products and materials procurement within the NPS.
- Manage waste associated with Computers and FAX/Printers.

5 Reduce and reuse wastewater

- Install low-flow faucets.
- Replace toilets with low-flow models.

STRATEGY 2: INCREASE CLIMATE CHANGE EDUCATION AND OUTREACH

Climate change is a complex and easily misunderstood issue. San Juan Island National Historical Park can play an integral role in communicating about climate change to a vast audience. A better understanding of the challenges and benefits of reducing GHG emissions can motivate staff, visitors, and community members to incorporate climate friendly actions into their own lives. San Juan Island National Historical Park recognizes that the greatest potential impact the park can have on mitigating climate change is through public education. Thus, the park sees public education as an end goal of any climate initiative. From increasing the efficiency of public transportation to developing a green purchasing program, the actions San Juan Island National Historical Park takes to address climate change serve as opportunities for increasing the public's awareness of climate change. Presented the actions that are currently under way and which comprise the park's progress to date, and those actions that the park will pursue.

Progress to Date

- Park is connecting with community and park partners on Climate Friendly Park efforts.

Park Staff

Incorporate climate change into park staff training, events, and performance plans

Developing a climate change education program for park staff is vital to increasing awareness about climate change among park visitors and fostering a sense of collective responsibility among staff to help reduce park emissions. By incorporating climate change education into staff development programs, San Juan Island National Historical Park will enable its staff to demonstrate their commitment through leading by example, and providing visitors with the tools and resources they need to reduce GHG emissions in the park and in their own communities. Potential actions include:

- Hold internal Climate Friendly Park discussions and workshops.
- Include the science and impacts of climate change into park education tools.
- Incorporate sessions on climate change into new staff training.

Visitor Outreach

Understanding climate change and its consequences is essential to initiating individual behavioral change. San Juan Island National Historical Park realizes that it has a unique opportunity to educate the public in a setting free from many of the distractions of daily life. By using existing materials, developing park-specific materials, highlighting what the park is currently doing about climate change, and encouraging visitors to reduce emissions, San Juan Island National Historical Park can play an important role in educating the public about climate change.

San Juan Island National Historical Park staff recognize the many different audiences that visit the Park, including recreational and non-recreational park visitors, "virtual visitors" who visit the park online, school-aged visitors, local and out of town visitors, local tribes, and external audiences. Reaching these various audiences with climate change information and engaging them in the park's efforts requires appropriately focused messaging. The park has developed a number of strategies to reach these various audiences effectively. These strategies include:

- Educate visitors about climate change.
- Create and distribute previously produced information on climate change and its effects on National Parks in general and on your park in particular.



- Integrate climate change themes into interpretive programs.
- Create signs promoting the park's efforts to curb emissions.
- Incorporate climate friendly information into interpreter programs and talks.

Local Community Outreach

The gateway communities, agencies, vendors, and volunteers surrounding San Juan Island National Historical Park can play a significant role in supporting the park's climate change mitigation goals. As such, when appropriate, park staff will assist local communities with incorporating climate change messages into community events and find partners to promote climate change education at those events, and engage with surrounding agencies to coordinate effective outreach and education efforts. Potential actions include:

- Consider the local economy in procurement and other areas.



STRATEGY 3: EVALUATE PROGRESS AND IDENTIFY AREAS FOR IMPROVEMENT

By taking the actions established in strategies 1 and 2 above, San Juan Island National Historical Park plans to reduce its emissions to the specified goals. Achieving these goals will require an ongoing commitment by the park, which may include subsequent emission inventories, additional mitigation actions, and reevaluation of goals. As part of this strategy, San Juan Island National Historical Park will:

- Monitor progress with respect to reducing emissions. This will include subsequent emission inventories to evaluate progress toward goals stated in this action plan.
- Develop additional emission mitigation actions beyond those listed in this plan.
- Periodically review and update this plan.
- The park will track climate friendly actions through the environmental management system.

CONCLUSION

San Juan Island National Historical Park has a unique opportunity to serve as a model for its visiting public.⁴ This report summarizes the operational actions the park commits to undertake to address climate change. Specifically, the park realizes its ability to educate the public and serve as a valuable model for citizens. By seriously addressing GHG emissions within the park and sharing its successes with visitors, San Juan Island National Historical Park will help mitigate climate change far beyond the park's boundaries.

The National Park Service faces an uncertain future due to the possible effects of climate change. However, by seriously addressing climate change impacts and reducing emissions, San Juan Island National Historical Park will reduce its contribution to the problem while setting an example for its visitors. The strategies presented in this Action Plan present an aggressive first step towards moving San Juan Island National Historical Park to the forefront of Climate Friendly Parks.

⁴ San Juan Island National Historical Park: Park Statistics. Available online at: <http://www.nature.nps.gov/stats/viewReport.cfm>

APPENDIX A: LIST OF WORK GROUP PARTICIPANTS

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David Harsh, Maintenance Worker

