National Park Service
U.S. Department of the Interior

CLIMATE*Friendly* PARKS

# Kenai Fjords National Park Action Plan

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# KENAI FJORDS NATIONAL PARK BECOMES A CLIMATE FRIENDLY PARK

As a participant in the Climate Friendly Parks program, Kenai Fjords National Park belongs to a network of parks that are putting climate friendly behavior at the forefront of sustainability planning in national parks. By conducting an emission inventory, setting an emission reduction target, developing this Action Plan, and committing to educate park staff, visitors, and community members about climate change, Kenai Fjords National Park is serving as a model for climate friendly behavior within the park service.

Kenai Fjords National Park has committed to reducing greenhouse gas (GHG) emissions by 40% below 2006 levels by 2015. This Action Plan lays out the measures the park will take to meet this goal. In addition to implementing these measures, Kenai Fjords National Park will:

- Perform subsequent emission inventories to monitor progress
- Identify additional actions to reduce GHG emissions and inform the public on climate change
- Include additional actions, and strengthen existing actions, to reduce GHG emissions in future Action Plans

# THE CHALLENGE OF CLIMATE CHANGE

Climate change presents significant risks and challenges to the National Park Service. At Kenai Fjords National Park, increased temperatures may increase glacial melt, alter the natural ecosystems present, and change both the habitats available for species and resources available for park visitor recreation.

Scientists cannot predict with certainty the general severity of climate change nor its impacts. However, the current warming trend suggests that the problem is real and should be taken seriously. Average global temperatures on the Earth's surface have increased about 1.1°F since the late 19$^{th}$ century, and the 10 warmest years of the 20$^{th}$ 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 ($CO_2$), methane ($CH_4$) and nitrous oxide ($N_2O$) —which trap heat that otherwise would be released into space.

The continued addition of $CO_2$ 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.[1] 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.

[1] 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>

# GOALS AND OBJECTIVES

The objective of this Action Plan is to identify actions that Kenai Fjords National Park can undertake to reduce GHG emissions and thus address climate change. This plan presents the park's emission reduction targets and associated reduction strategies designed to achieve the park's emission reduction goals.

While the plan does not provide detailed instructions on how to carry out each of the proposed measures, it provides the essential framework needed to meet Kenai Fjords National Park's emission reduction targets. The plan presents an opportunity for the park to devote resources for climate action through a mandate from the park's superintendent. This mandate gives park staff the resources and authority to pursue the mitigation strategies contained in this plan.

Kenai Fjords National Park aims to:
*Reduce GHG emissions to 40% below 2006 levels by the year 2015 by implementing emission mitigation actions identified by the park.*

In order to meet or surpass this goal, the park will implement strategies proposed in this plan that build from the park's current and future emission inventories. Specifically, the plan recommends three main strategies:

Strategy 1: Reduce emissions from park facilities and operations by identifying and implementing emission mitigation actions.

Strategy 2: Increase climate change outreach and education efforts.

Strategy 3: Evaluate progress and identify areas for improvement.

# GREENHOUSE GAS EMISSION INVENTORY AT KENAI FJORDS NATIONAL PARK

Naturally occurring greenhouse gases include $CO_2$, $CH_4$, $N_2O$, 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.

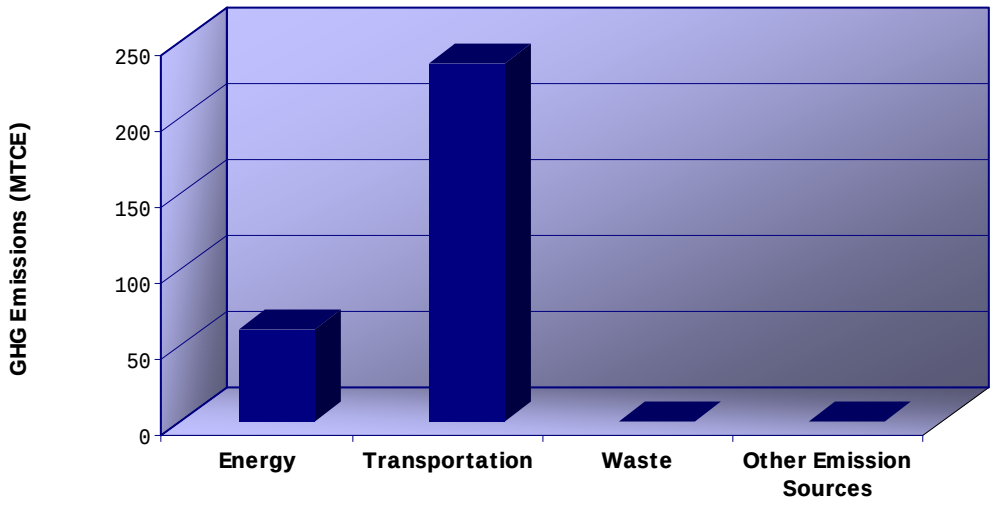
## Greenhouse Gas Emissions

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

In 2006, Kenai Fjords National Park's GHG emissions totaled 297 metric tons of carbon equivalent (MTCE). This total includes emissions calculated from Park Operations, Residents/Visitors, and Concessioner operations. As Figure 1 and Table 1 demonstrate, the largest emission sector for Kenai Fjords National Park is Transportation - totaling 236 MTCE. Stationary combustion was the second largest source of emissions - totaling 53 MTCE.

# FIGURE 1

*Kenai Fjords National Park's 2006 Greenhouse Gas Emissions by Sector*




# TABLE 1

*Kenai Fjords National Park's 2006 Greenhouse Gas Emissions by Sector and Source*

| | Emissions (MTCE) | % of Total |
|---|---|---|
| Energy | 61 | 21% |
| Stationary Combustion | 53 | 18% |
| Purchased Electricity | 8 | 3% |
| Transportation | 236 | 80% |
| Mobile Combustion | 236 | 80% |
| Waste | 0 | 0.0% |
| Other Emission Sources | 0 | 0.0% |
| Total Emissions | 297 | |

Note: Totals may not sum due to rounding.

# How Kenai Fjords National Park is Responding to Climate Change

*The following actions were developed by Kenai Fjords National Park in order to meet the park's climate change mitigation goals.*

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

## Energy Use Management

*Emission Reduction Goal: Reduce energy use emissions to 50% below 2006 levels by 2015.*

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. As the inventory results indicate, approximately 21 percent of the park's GHG emissions result from energy consumption. Consequently, Kenai Fjords National Park will take the following actions to reduce energy-related emissions. The following strategies were developed to meet the park's energy use emission reduction goal:

### 1 Install energy efficient light fixtures and light-controlling devices

- Improve management of office lighting. During bright summer days most staff turn off artificial lighting.
- Research LED lighting for use in areas where principal energy source is solar.
- Change from standard computers and monitors to Green Star rated computers and flat screen monitors.

### 2 Produce clean energy or purchase electricity from a renewable energy provider

- Research off-the-grid power system technologies for the Exit Glacier area to power the Nature Center and public water supplies.
- Use solar panels in remote field camps.

### 4 Other

- Replace boiler at Legends Building.
- Shift from fuel oil to propane in public use cabins.
- Maintain boiler inspection and maintenance programs.
- Replace generators with fuel efficient generators.
- Investigate the possibility of 4 x 10 hour days in the off-season, which may reduce energy consumption and the park's carbon footprint.
- Collaborate with partners to explore seawater heat exchange technology for future park construction projects.

## Transportation Management

*Emission Reduction Goal: Reduce transportation emissions to 40 % below 2006 levels by 2015.*

Reducing vehicle miles traveled, improving vehicle efficiency and using alternative fuels can significantly reduce Kenai Fjord's emissions. As the inventory results indicate, 80 percent of the GHG emissions are a result of mobile combustion. The following strategies were developed to meet the park's transportation emission reduction goal:

### 1 Reduce fuel consumption by NPS, concession, and visitor vehicles

- Replace standard gasoline and diesel vehicles with hybrid vehicles.
- Purchase a GEM electric car for local driving.
- Work idea of "Economy of Motion" into all park travel by consolidating the number of trips for vehicles, equipment, and watercraft. Conserve fuel through proper operation.
- Increase car pooling, encourage walking and bicycling as alternatives to local driving.

### 2 Use alternative fuels and oils in vehicles, watercraft, and equipment

- Utilize a commercial SVO bus service to move park employees from one worksite to another.

### 3 Other

- Sponsor an annual commute challenge, which increases the use of bicycles or walking as an alternative to driving vehicles during the summer season.
- Rebuild large vessel diesel engines.
- Maintain effective vehicle inspection and maintenance programs.
- Replace two stroke engines (outboards and snowmachines) with cleaner burning four stroke engines.
- Improve property management by selling excess equipment or moving the equipment to another park or the state of Alaska. Equipment includes vehicles, small boats, hand and power tools, furniture, and scientific equipment.

### 4 Purchase carbon credits to offset remaining emissions

- Purchase carbon credits and renewable energy certificates to offset remaining carbon emissions produced from park owned vehicles and vessels and to offset park staff airline travel.

## Waste Management

*Emission Reduction Goal: Reduce waste emissions to 50% below 2006 levels by 2015 through waste diversion and reduction.*

The connection between waste and GHG emissions may not be obvious. However, waste management—in the form of source reduction and solid waste reduction—can dramatically reduce GHG emissions. The less we consume in terms of products and

packaging, the less energy is used and fewer GHGs are emitted. Additionally, reducing the amount of waste sent to landfills reduces $CH_4$ emissions caused by decomposition.

Diverting or reducing the park's waste stream through increased recycling efforts and waste management procedures will reduce the amount of waste sent to landfills, which are the largest human-generated source of $CH_4$ emissions in the United States. While Kenai Fjords National Park's activities emitted less than 1 MTCE from waste management in 2006, the following strategies were developed to continue reducing the Park's waste emissions:

### 1 Manage waste through source reduction, composting, recycling, and combustion

- Fully participate in the Environmental Management Systems program.
- Participate in the Federal Green Challenge Program.
- Recycle: plastics, glass, paper, cardboard, fluorescent tubes, used motor oil, electronics (computers, printers, fax machines), and batteries (for vehicles and small electronics).
- Purchase wood chipper to turn brush from trail maintenance to mulch.
- Purchase compostable dishware and utensils for use at park events.

# STRATEGY 2: INCREASE CLIMATE CHANGE EDUCATION AND OUTREACH

Climate change is a complex issue that the park can help communicate to the public. A better understanding of the problem and the benefits of reducing GHG emissions can motivate staff, visitors, and community members to incorporate climate friendly actions into their own lives. Kenai Fjords National 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 that Kenai Fjords National Park takes to address climate change serve as opportunities for increasing the public's awareness of climate change and strategies to mitigate its impacts.

## Park Staff

Developing a climate change education program for park staff is vital to increasing awareness about climate change among park visitors. By incorporating climate change education into staff-development programs and creating new opportunities for staff to learn about climate change, Kenai Fjords National Park will reduce park emissions and provide visitors with the tools and resources they need to reduce GHG emissions at home and in their own communities.

### 1 Incorporate climate change into park staff training and individual performance plans

In an effort to provide Kenai Fjords National Park staff with the knowledge and tools to educate visitors, the park will:

- Incorporate sessions on climate change into annual All Staff Training.
- Incorporate education on the science and impacts of climate change into education tools (e.g., seasonal staff handbook) used during seasonal staff orientation.

- Provide Kenai Fjords' "Green Team/Environmental Management Team" with materials, publications, and tools available from the U.S. Environmental Protection Agency (EPA) and other agencies and organizations to mentor fellow staff about climate change.
- Institute monthly status checks on progress in staff meetings.
- Develop intranet pages to inform staff about climate friendly actions being taken throughout the park, encourage staff to continue to strive towards more greenhouse gas emissions reductions, and advise them on new ways to reduce GHG emissions.
- Incorporate education on the science and impacts of climate change into partnership and CUA training.
- Utilize the park "Green Team" to devise new strategies to reduce greenhouse gas emissions and acknowledge success of current strategies.

## Visitors

Understanding climate change and its consequences is essential to initiating individual behavioral change. Kenai Fjords National 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, Kenai Fjords National Park can play an important role in educating the public about climate change.

### 1 Incorporate climate change awareness into visitor education

Park interpretive staff has the opportunity to introduce the issue of climate change to many visitors. Kenai Fjords National Park encourages staff to include messages about climate change in their visitor talks. The park will:

- Include messaging about climate change and what the park is doing in formal interpretation.
- Place interpreters on shuttles to educate visitors on facts of climate change during transportation.
- Develop consistent and non confusing educational displays with current information about the science of climate change.
- Collaborate with partners and identify potential new partners for collaborations on developing and delivering climate education products to help visitors and non visitors gain a better understanding of the science of climate change and effects of climate change to park resources.
- Update OASLC climate change PowerPoint presentation annually for delivery to visitors at the Alaska SeaLife Center.

### 2 Develop park-specific interpretive materials for visitors and non visiting public

Educating visitors about the tangible effects of climate change is a powerful way to encourage visitors to reduce GHG emissions. The park will use existing climate change interpretive resources, and promote the development of climate change materials specific to impacts and adaptations in Kenai Fjords National Park. The park will:

- Determine how the park will adapt and react to climate changes and prepare to share this message with visitors and non visiting public.

- Include climate change messages in park field trips and other programs.
- Develop climate change handouts that discuss the current and future impacts of climate change on the park.
- Develop and post to the web park-specific information on climate change using podcasts.

### 3 Highlight what the park is doing to address climate change

Kenai Fjords National Park has already taken many climate friendly actions. In an effort to lead by example and demonstrate climate friendly behavior for the public, the park will increase education and outreach efforts related to sharing the successes it has already achieved. The park will:

- Develop messaging in formal and informal interpretive settings to discuss actions that the park is taking to mitigate the impacts of climate change.
- Disseminate information about climate friendly actions the park is taking at conferences and regional workshops.

### 4 Encourage visitors to reduce greenhouse gas emissions

Perhaps the greatest potential for Kenai Fjords National Park to help reduce GHGs is to increase visitors' awareness of how they can reduce their personal GHG emissions. The park will:

- Implement the Do Your Part program at Kenai Fjords National Park.
- Incorporate Do Your Part! materials including kiosk, poster, and brochures into park materials.
- Distribute messaging about actions that visitors can take to reduce the impact of their visit through posters etc.
- Implement Green Tag Program with tour boat partners and other partners as appropriate.

DO YOUR PART! FOR CLIMATE*Friendly* PARKS

The Do Your Part! for Climate Friendly Parks program provides easy actions people can take every month to reduce emissions in their everyday lives.

## Local Community

The communities within and surrounding Kenai Fjords National Park can play a significant role in supporting the parks GHG reduction goals. As such, when appropriate, Kenai Fjords National 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. Park staff will use their knowledge of climate change resources to help local communities engage in climate friendly actions.

### 1 Encourage climate change awareness among the communities within both the park and region

Kenai Fjords National Park realizes that the communities within the park and the region are one of the greatest assets in addressing climate change at Kenai Fjords. The park will:

- Collaborate with off site partners, such as the Alaska SeaLife Center, to provide a venue to deliver climate change presentations to visitors and non visitors.
- Develop media strategy on climate change to provide public information such as podcasts focusing on climate change.
- Work with surrounding community leaders to inspire them to take action on climate change in conjunction with the Park.

- Reach out to individuals in surrounding communities by discussing Kenai Fjord's initiatives and how to get involved either in person or through Do Your Part! at fairs, farmer's markets and other events.
- Collaborate with other agencies and the park's gateway community to explore climate friendly opportunities such as the net metering program.
- Collaborate with the park's gateway community to establish a bike friendly community.
- Present quarterly climate friendly briefings during Seward City Council Meetings.

## STRATEGY 3: EVALUATE PROGRESS AND IDENTIFY AREAS FOR IMPROVEMENT

By taking the actions established in strategies 1 and 2 above, Kenai Fjords National Park plans to reduce it's emissions to the specified goal. Achieving this goal will require an ongoing commitment by the park, which may include subsequent emission inventories, additional mitigation actions, and revaluation of goals.

- Utilize a variety of tools to perform subsequent emission inventories to evaluate progress toward goals stated in this action plan including Climate Friendly and Environmental Management Systems tools.
- Develop additional emission mitigation actions beyond those listed in this plan.
- Utilize the park "Green Team" to track progress on achieving this plan and report back to the management team.

## CONCLUSION

Kenai Fjords National Park has a unique opportunity to serve as a model for approximately 250,000 visitors annually.[2] 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, Kenai Fjords National Park will help mitigate climate change far beyond the park's boundaries.

This Action Plan also serves as an important enhancement mechanism for the Park's Environmental Management System (EMS). Realistic environmental commitments created by Kenai Fjords National Park staff and approved by the park's superintendent will significantly reduce the park's GHG emissions in the coming years. The mitigation actions included in this plan have been developed in order to be directly transferable to the park's EMS. Kenai Fjords National Park's Action Plan thus provides an effective way to meet EMS goals.

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, Kenai Fjords National 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 Kenai Fjords National Park to the forefront of Climate Friendly Parks.

[2] Kenai Fjords National Park: Park Statistics. Available online at: http://www.nature.nps.gov/stats/viewReport.cfm