Implementing Green Parks Initiatives in Your Parks

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SESSION DESCRIPTION
With a “green” wave sweeping the nation, our parks and recreation agencies need to advocate for more environmentally responsible practices. Get your organization involved with a green parks initiative using a few simple steps and changes modeled after national park units.

SESSION LEARNING OBJECTIVES
- Understand the concept of a green parks initiative and the costs, benefits and limitations for implementation.
- Identify specific methods to improve park and agency sustainability practices in the context of better stewardship.
A more accurate and more widely accepted name for “Global Warming”
The collective name of a group of gasses which get trapped in our atmosphere and cause increased warming.

Nature recognizes no jurisdictional ________, making climate change a particularly difficult dilemma for parks.

Research, mitigation, adaptation, and ________ are all parts of the climate change solution.

Greenhouse Gases

Boundaries

Education
While the most widely recognized greenhouse gas is **carbon dioxide**, other contributing gasses that result from park activities include methane, nitrous oxide, and high global warming potential gases such as hydroflourocarbons.

The combustion of **fossil fuels** and other fuels in boilers, furnaces, water heaters, and generators produces CO₂, CH₄ and N₂O.

Though E-85 burns more cleanly, according to one Cornell University Study, the production of ethanol actually creates a net energy ____ (loss or gain).

Producing corn and processing it into 1 gallon of ethanol requires 131,000 BTUs of energy; but 1 gallon of ethanol contains only 77,000 BTUs. (David Pimentel, Cornell University)
Methane is over ____ times more effective in trapping heat in the atmosphere than carbon dioxide (CO2) over a 100-year period.

a) 10  b) 12  c) 20

According to the Dark Skies Initiative, _____ costs Americans an estimated $4.5 billion in wasted electrical energy, consuming unnecessary fossil fuels and polluting our air and skies.

Power directly extracted from heat stored in the Earth.

Geothermal Energy
Thin film photovoltaics are now available and provide more diverse opportunities for parks to utilize solar energy technology.

Planting prairie plants and other native plant species in strategic locations can reduce greenhouse gas emissions by reducing the need for ______.

The Four “R”s of waste reduction and green living include:
1) Reduce    2) Reuse
3) Recycle, and
4) ________.
Up to ______ % of new asphalt can be comprised of recycled asphalt.

a) 5       b) 10      c) 25

Recycled ______ can be used for road shoulders, trail surfaces, and other construction applications thereby diverting it from the waste stream.

Using ___ made from recycled HPDE plastic reduces deforestation thereby facilitating carbon sequestation …

…and this type of material can hold screws 50% better than wood!
Plastic lumber

Paved areas like roads, sidewalks, and parking lots as well as buildings are often called _______ and prevent the natural absorption of water into the soil.

Hardscape

These serve several purposes for a building, such as absorbing rainwater, providing insulation, creating a habitat for wildlife, and helping to lower urban air temperatures and combat the heat island effect.

Green Roofs

A planted depression that allows stormwater runoff from impervious areas (e.g. roofs, pavement, etc.) to be filtered and soaked into the ground.
Rain Garden

Use of this alternative paving material is considered a BMP by the EPA because it allows rainwater to percolate into the soil minimizing pollution, flooding, and erosion.

Pervious or Porous Concrete

Thank You for Playing Jeopardy
And for being GREEN!!

Game Designed By C. Harr-MAIT
What Drives Us?

Administrative Mandates, Directives and Policies

Administrative mandates, directives and policies direct the Federal Government to be a leader in Environmental Stewardship.

What Really Makes it Work?

- The right technology for the application
- Creativity
- Perseverance
- Open-mindedness
- Participation
- Education
- Be Excited!
- And a willingness to Change!

Photovoltaic's

Specify “Dark Sky” Compliant Lighting

Photovoltaic’s Dunes Learning Center
Solar Powered Storage Cabin

Solar panel and shingles power interior lights, vacuum, ceiling fan, and vent as a demonstration at the park’s overnight grade school educational camp.

LEED Construction Possibilities

Portage Lakefront
- Gold LEED Certified 3,400 s.f. Pavilion
- Site is a previous industrial brown field
- Reserved parking for low-emitting vehicles & carpoolers
- Geothermal-heat pump HVAC system
- White membrane roof to reduce heat island effect
- A restored site for Federally listed Pitchers thistle
**Lessening Hardscape**

Pervious or Porous Pavement:
- Reduces rate and quantity of stormwater run-off
- Reduces stress on combined sewer systems
- Light color reduces urban heat island effect
- Filters silt, pollutants and debris

**Waste Management**

Did you know per capita, each person in the United States discards approx. one tire each year?

Each ton of rubberized asphalt will divert that tire from the waste stream.

**Recycling**

Recycled Lumber:
- 50% Recycled Plastic
- 50% Reclaimed Wood

**Waste Management**

Paper towels have been eliminated in all public facilities in the park

Surfaces are cleaned with machine washable micro-fiber cloths

**Waste Management**

Zero VOC emitting paint for all interior work areas
- Safer for everyone!

**Waste Management**

Do a Waste Audit:
O.K. ... It’s gross but you can really find out what your fellow employees are up to!
Employee Recycling

The Results of the Audit:
• Paper recycling in all offices
• Co-mingled recycling bins in all common areas
• And lots of reminders!

Waste Management

OFFICIAL CORRESPONDENCE VIA ELECTRONIC MAIL
NO HARD COPY TO FOLLOW
National Park Service
Pacific West Region
1111 Jackson Street, Suite 700
Oakland, California 94607
(510) 417.1300

• Do you really need a hard copy?
• Duplex printers throughout the park
• Electronic correspondence
• The “Catalog Cops”

Visitor Recycling

Recycling
Please place empty aluminum and plastic beverage containers in labeled recycling barrels

• Location, Location, Location
• Clear labeling
• Restricted opening on recycling container

Lessening Hardscape

10 out of 10 park employees surveyed say this is the ugliest building in the park!

Treating Stormwater Run-off

Same building, other end...still bad...

The Park Headquarters Future Rain Garden will:
• Reduce mowing
• Reduce stormwater run-off
• Reduce pollution from pavement surfaces
• Provide a wildlife habitat
• Low/No maintenance
• Be attractive
• And, provide seeds for on-going park restoration
Educate!..Educate!..Educate!

Topics Have Included:
- Alternative Fuel Vehicles
- Paper Consumption
- Energy Consumption
- Co-mingled Recycling
- Water Consumption
- Env. Management System
- Renewable Energy
- Effects of Vehicles Idling
- Climate Friendly Park’s

Other Notable Activities
- 30%+ of fleet are alternative fuel vehicles
- Abrasives rather than salt is used for de-icing
- Park-wide retrofit to efficient T-8 lighting fixture
- Use of low flow fixtures & Energy Star rated products
- Elimination of fueling system within the park
- Use of electronic thermostats with night-time setback
- Use of bio-based oils for chainsaws and 2-cycle equipment
- Strong employee recycling program including:
  - Batteries
  - Electronics
  - All paper products
  - Co-mingled items
  - Scrap metal
  - Fluorescent light bulbs
- Purchasing recycled content paper products
- Implemented a Green Procurement policy including training

NATIONAL PARK SERVICE

Questions?

Let’s Get Going

Take the first step!

1. Choose an action your park could take to become more sustainable.
2. List the specific benefits derived from taking this action.
3. List the steps needed to accomplish this action.
4. Explain how you would decide whether or not to proceed with the action.
The Climate Friendly Parks (CFP) Program provides parks with management tools and resources to address climate change.

- Three-pronged approach
  - Measure emissions
  - Develop strategies to mitigate emissions and adapt to impacts
  - Share successes and educate the public about what they can do in their own lives

22 national parks have officially become CFP Member Parks
- Actively working with more than 70 parks throughout NPS
- Collectively, CFP Member Parks have pledged to reduce approximately 75,000 tons of CO2
- All Pacific West Region parks are joining CFP

Becoming a Climate Friendly Park

**Milestones:**
- Submit a CFP application
- Develop a GHG emission inventory
- Complete a Climate Action Plan

**Ongoing Activities:**
- Implement the Action Plan
- Launch Do Your Part! for Climate Friendly Parks
- Monitor progress, improve actions, and report results

GHG Accounting Primer

- **Greenhouse Gases**
  - Carbon Dioxide (CO2), Methane (CH4), Nitrous Oxide (N2O), and high Global Warming Potential (GWP) Gases (HFCs, PFCs, SF6)
- **Emission Sources**
  - Stationary Fossil Fuel Combustion (Energy)
  - Purchased Electricity (Energy)
  - Mobile Fossil Fuel Combustion (Transportation)
  - Landfilled Solid Waste (Waste)
  - Wastewater Treatment (Waste)
  - Refrigeration and Air Conditioning (Other)
  - Fertilizer Application (Other)
- **Entities**
  - Park Operations, Visitors, Concessioners, etc.
Inventory Worksheet
Primary Data Needs: GHG Inventory

Stationary Combustion
- Natural Gas
- Diesel Fuel
- Propane
- Biodiesel
- Kerosene
- Wood
- Coal

Electricity Purchased
- Provider 1 (Name)
- Provider 2 (Name)

Inventory Worksheet
Primary Data Needs: GHG Inventory

Mobile Combustion
- Gasoline Car
- Gasoline Truck
- Gasoline Heavy Duty
- Diesel Car
- Diesel Truck
- Diesel Heavy Duty
- Boats
- Helicopters
- Airplanes
- Chainsaws & BrushCutters

Lawnmowers & Leaf Blowers
Snow Blowers
Small Tractors

Inventory Worksheet
Primary Data Needs: GHG Inventory

Wastewater Treatment
- Wastewater Treated
  % treated aerobically

Solid Waste Disposal
- Landfilled Waste
- Incinerated Waste

Fertilizer Application
- Synthetic Fertilizer Use
- Organic Fertilizer Use
- Manure Use

Refrigeration and Air Conditioning

Additional Criteria Air Pollutant Data

Wood Burning
- Personal Care Products
- Household Products
- Automotive Products
- Adhesives and Sealants
- FIFRA-Regulated Products
- Coatings (Non-Architectural)
- Architectural Water-based
- Architectural Solvent-based

Understanding Scope

- Direct and Indirect Emissions
  - Direct Emissions - those that result from sources you own or control
  - Indirect Emissions - those that occur as a result of your activities, but occur at sources owned or controlled by somebody else

- Scope
  - Scope 1 - direct emission sources
  - Scope 2 - indirect emissions from purchased electricity
  - Scope 3 - all other indirect emission sources
    - E.g., visitors, concessioners
An average CFP Park generates about \(1,850 \text{ MTCO}_2\text{E}\) from Park-owned buildings, vehicles, equipment, etc. (Scope 1 and Scope 2).

Future Inventories

- **Annual LOE: Park Operations Only**
  - Total park building and facility fuel consumption by fuel type (e.g., natural gas, diesel fuel)
  - Total electricity consumed by park buildings and facilities (kWh)
  - Total park vehicle fuel consumption by fuel (e.g., gasoline, diesel) by vehicle type
  - Total waste sent to landfill and/or incinerated
  - Total wastewater treated at a wastewater treatment plant
  - Refrigerator and Air Conditioning use in park facilities (units containing HFC-134a and R-401 should be counted)

- **Five-year LOE: Full Park Inventory**
  - Concessions
  - Visitors
  - Other Permitted Activities

An average CFP Park’s total GHG emissions equal about \(21,000 \text{ MTCO}_2\text{E}\).

**What is a Climate Action Plan?**

A report containing the actions that the Climate Friendly Park will take to mitigate GHG emissions, educate the public and park staff about climate change, and adapt to a changing climate.

- **Key Elements**
  - Inventory results
  - Emission Reduction Goals
  - Actions (mitigation, education, adaptation)

**Creating a Climate Action Plan**

- Review existing plans for relevant existing/planned actions
- Review Action Planning Menu to select actions and seed ideas for new actions
- Meet with Green Team or EMS Team to tailor actions to your park
- Set emission reduction goals
- Enter information into Climate Action Plan template for public-facing document
- Enter information into Module 2 for scenario planning
Action Planning Menu Overview

**Menu Action:** Install energy efficient light fixtures

**Tailored Action:** Replace all incandescent light bulbs at the Visitor Center with compact fluorescents and institute a no “snap-back” policy.

Setting a GHG Reduction Goal

Executive Order 13514 - Federal Leadership in Environmental Energy, and Economic Performance
- Establish and report agency greenhouse gas reduction targets for FY 2020 relative to a fiscal year 2008 baseline.
- 28% reduction in absolute GHG emissions from federal operations

GHG Emission Reduction Goal

- **Meeting**
  - 30% reduction in absolute GHG emissions from park operations
  - Olympic National Park, 30% below 2007 levels by 2016
- **Reaching**
  - 50% reduction in absolute GHG emissions from park operations
  - Bandelier National Monument, 50% below 2007 levels by 2015
- **Leading**
  - Pacific West Region, Vision of Carbon Neutrality
  - The goal should be low enough to be achievable, but high enough to stimulate creativity and innovation.

CLIP Tool Module 2: Inventory Tracking

Emission Inventory Sheet

If this is the first time you are using Module 2, please set your current year as your baseline year by clicking the “Set Current Year as Baseline Year” button below.

Please note: If you have not completed the results of your emissions inventory from Module 1 in the Carbon Tracker, you will not be able to designate a baseline year.

If you have already completed Module 1, you can enter emission inventory information for the current year by clicking the “Save Current Year Data” button. Doing so will save your current year’s data, but the baseline year will remain the same year for preparing in the future and setting emission reduction goals.

CLIP Tool Module 2: Inventory Tracking

The results of all inventories are summarized in Figure 1.
We CAN make a difference
...Pass it on!!

Climate Friendly Parks

- Climate Friendly Parks Program
  http://www.nps.gov/climatefriendlyparks

Be a Green Park

Some Final Thoughts

- Select a practice that has the most impacting and mitigate it...
- Pick the right technology for the situation.
- Start small and grow the program...
- Begin with something visible and cheerlead the heck out of it...
- Most people want to “be green”. Make it easy for them.
- Education generally costs very little, but the payoff is huge!