Oil Spill Response
Summary of In-Situ Burn Practitioners Workshop
December, 2008

Freshwater Spills Symposium

St. Louis
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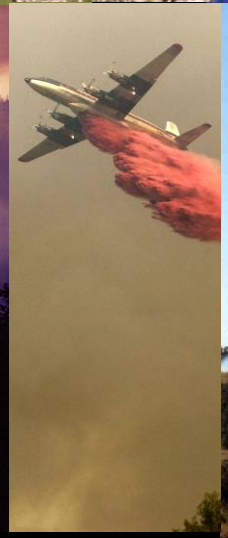
The Workshop

- On December 9th through 11th in Houston, Texas, a ground breaking In-Situ Burn (ISB) Practitioners Workshop was sponsored by the American Petroleum Institute (API)
- The workshop brought together for the first time wild land fire management specialists, Federal trustees, researchers, industry members, and a representative from The Nature Conservancy (TNC)
- The workshop focused on providing field practitioners with an opportunity to share their expertise, define best practices and lessons learned, and develop a forward looking plan to advance ISB policy, research and training

The Purpose: Share Learnings for In-Land and On Water Responses








The Goals

- The Planning Committee established the following goals for the workshop:
  - Network and build relationships between key stakeholders, including the oil spill community and Federal fire management agencies
  - Identify and prioritize the relevant elements to be included in future ISB training programs
  - Examine green house gas (GHG) aspects of ISB
  - Develop an action plan to advance ISB training & research in 2009 and beyond

The First Day

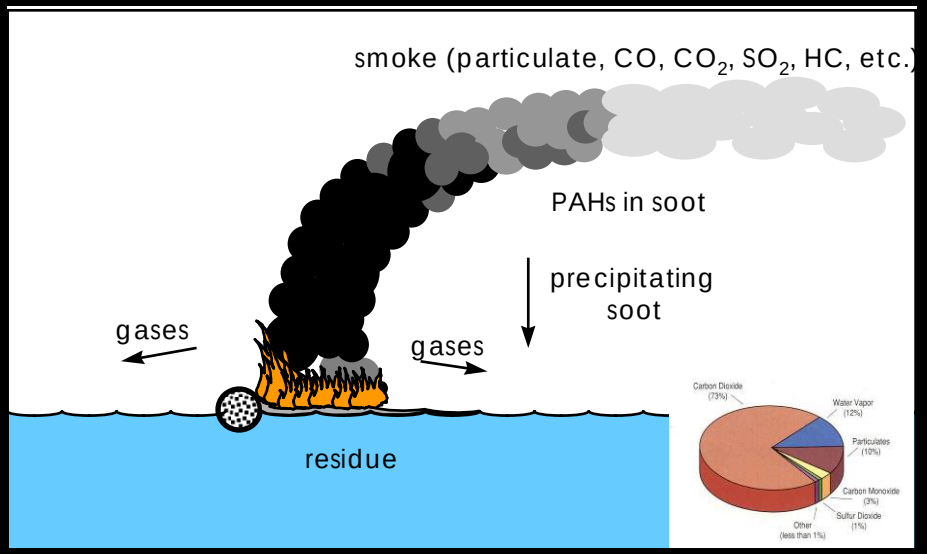
- Speakers provided an overview of ISB and wild land fire management, and presented various case studies. They shared their views on:
  - Advantages and Disadvantages of ISB
  - Environmental/Health Concerns of ISB
  - The history and background of national fire policy
  - The importance of the fire management reference guide

The Second Day

- Focus was on:
  - Planning Considerations
  - The Fire Management System
  - The Incident Command System
  - Air and Risk Management
  - Predictive Services
  - Fire Behavior

The Final Day

- Included presentations from the Forest Service's Missoula Fire Sciences Laboratory on research findings related to soil effects and greenhouse gas emissions from ISBs, as well as presentations on implementation strategies and techniques and smoke management
  - ➢ Most of this final day was dedicated to the development of action plans for policy, training and research to advance ISB



Forest Service Fire Management Experience

- The US Forest Service and allied agencies have a large amount of experience in controlled burns
- Oil spill response use of ISB is not limited to on water events
  - In fact, in land use of ISB may have greater potential for more frequent use
- Wood land burn experience and the methods for managing them effectively may be applicable to oil spills

Appropriate Management Response (AMR)

- …the AMR ranges across a spectrum of tactical options (from monitoring to intensive management actions)… [and]…is developed by using strategies and objectives identified in the Fire Management Plan."

Full intensive suppression operations

Wildland Fire Use

AMR Concept – Analogous to NEBA

- Fires are neither good nor bad – management is needed to obtain desired effects
  - Effectively the same as Net Environmental Benefit Analysis

- Benefits
  - Safety
  - Resource benefits
  - Cost
- Risk
  - Public safety
  - Resource damage
  - Probability and cost of escape

Managing Wildland Fire More Efficiently

- Safety
  - Firefighters and the Public
- Cost
- Values at Risk
- Potential Benefits
  - Wildland fire use may be considered

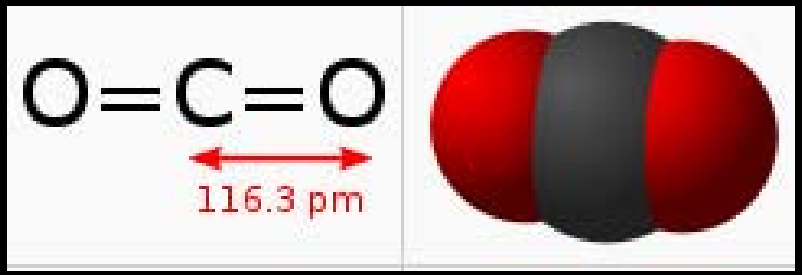
Oil Spill Response ISB and Wildland Fires

- Based on what was shared, there are similarities between approaches to oil spill ISB and controlled wildland fires
  - They may be the most environmentally benign of multiple options, especially in remote and / or sensitive areas
- Burn plans are needed for each
  - Consider risk to personnel, the environment, the public
  - Weather conditions, resources at risk, equipment needs and availability, etc. all need to be considered

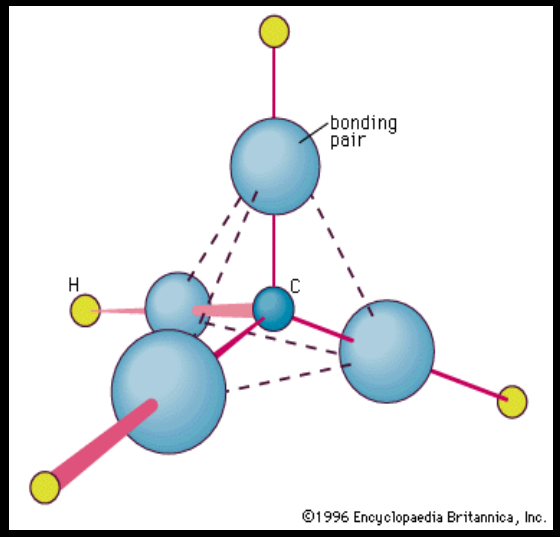
Other Considerations for In-Situ Burning

- Greenhouse Gas Emissions
  - What Makes a Greenhouse Gas ?

The ability of a gas to absorb IR radiation - due to the nature of its (covalent) molecular bonding.



CO_2



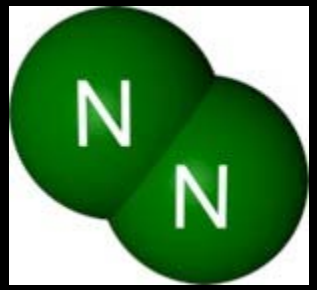
CH_4

The Earth's Atmosphere

78 % Nitrogen 20.8 % Oxygen 0.9 % Argon

Nitrogen (N_2) and oxygen (O_2) are not greenhouse gases.

Diatomic molecules such as N_2 and O_2 and monatomic species such as Ar neither absorb nor emit infrared radiation.



Nitrogen

The Earth's Atmosphere

- *In order, Earth's most abundant greenhouse gases are:*

- **Water vapor -H_2O**
- **Carbon Dioxide- CO_2**
- **Methane- CH_4**
- **Nitrous Oxide- N_2O**
- **Ozone- O_3**
- **Chlorofluorocarbons (CFCs)**

Global Warming Potential

	Atmospheric Lifetime – yrs	**GWP** (100 years)
Carbon Dioxide		1
Methane	12	23
Nitrous Oxide	114	296
HFC-23	270	14800
SF_6	3200	22800

Elemental Content of Oil

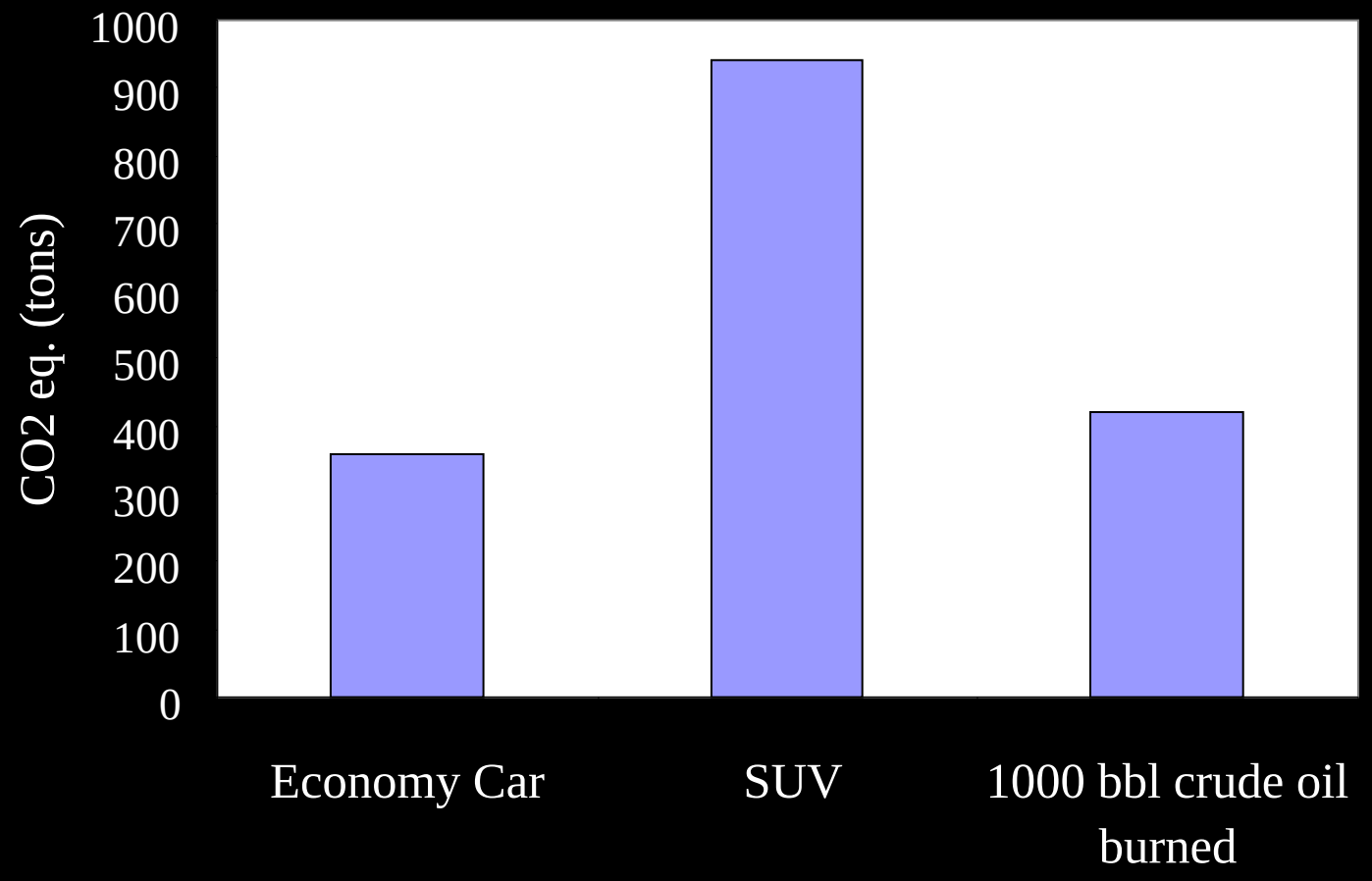
Oils, Diesel, Fuels

83 - 87% Carbon
14% Hydrogen
1–3% Sulfur
1% other Elements–
- Nitrogen (0.1- 0.4%)
- Oxygen
- Metals
- Salts

Vegetation Fuels

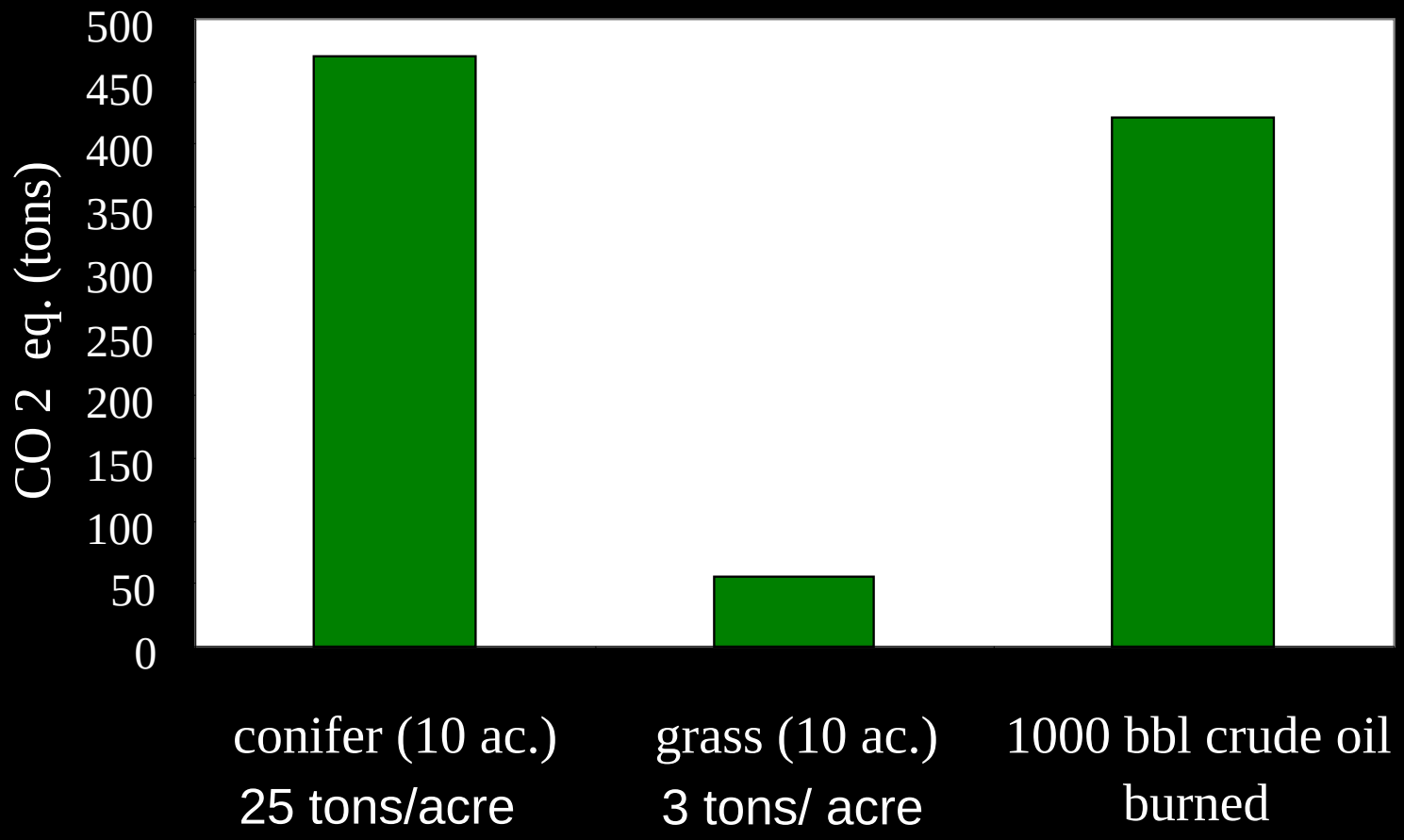
45-55% Carbon
0.01–1% Nitrogen

In-situ Burning vs. Car Emissions

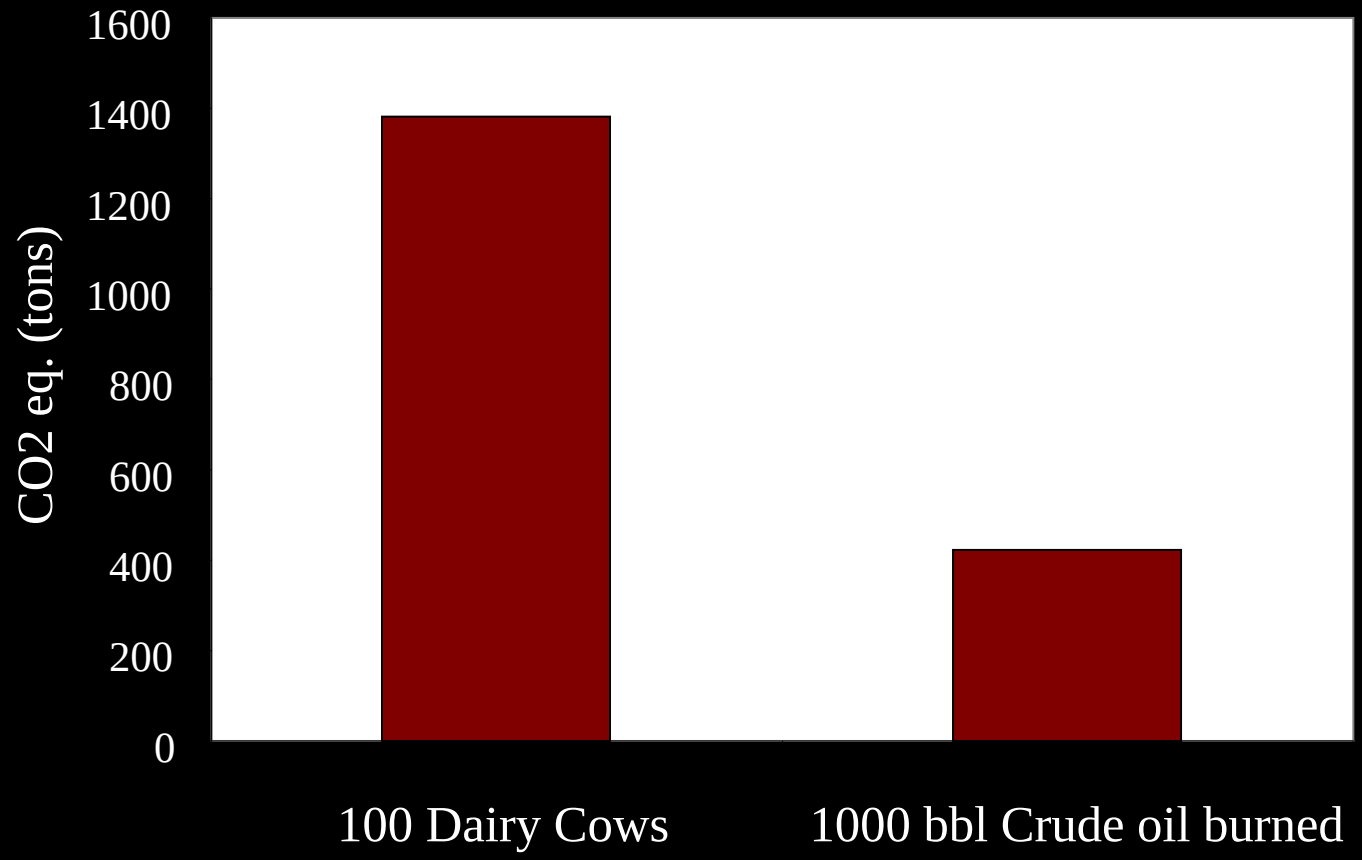


12,000 mi. annual emissions, 100 cars

In-situ Burning vs. Vegetation Fires



Annual Emissions In-situ Burning vs. Dairy Cows



In-Situ Burn GHG Findings

- CO_2 is the major GHG emission from in-situ oil burning, with less amounts of CH_4 and N_2O
- Estimate 422 kg CO_2 eq GHG emissions per barrel of crude oil burned
- Aerosol and soot emissions from crude oil ISBs are not significant anti-greenhouse (cooling) factors
- A small (1000 bbl consumed) ISB fire is equivalent to a 10-acre wildfire (25 tons/acre) in terms of GHG emissions
- ISB (theoretical) of Exxon Valdez oil spill = 12,850 SUV's annual GHG emissions @ 12,000 miles

Summary and Future Steps

- The primary action items that ISB Workshop participants proposed are:
  - Develop a Memorandum of Understanding (MOU) to allow various Federal agencies to work together easily on ISBs
  - Creation of an ISB issues white paper to inform policy makers
  - Creation of a job aid for ISB similar to the Forest Service Incident Response Pocket Guide to provide a baseline for training
  - Continue R&D efforts with a short term focus on synthesizing prescribed and wildfire burn studies applicable to ISB and formalizing risk analysis and decision making
  - Develop a 2.5 day training program for management policy, incident management and technical personnel to be held by the spring of 2010 – Stay Tuned