A New Environmental Footprint for Agriculture in Illinois

ISTC 2009-2010 Seminar Series
2-11-10
Illinois EPA
**Mission:** to safeguard environmental quality, consistent with the social and economic needs of the State, so as to protect health, welfare, property and the quality of life.

**Locations:** Headquarters & Laboratory – Springfield

11 Field & Regional Offices: Champaign, Elk Grove, Moline, Rockford, Collinsville, LaSalle, Des Plaines, Springfield, Elgin, Marion, & Peoria

**History:** First Earth Day – April 22, 1970

Illinois Environmental Protection Act – July 1, 1970 (first state)

- Solid Waste Disposal Act - 1965
- Clean Air Act – 1967
- Clean Water Act –1972
- Safe Drinking Water Act – 1974
- Superfund (CERCLA) - 1980
Organization

- Bureaus: Air, Land & Water
- Divisions: Legal Counsel, Laboratories & Administration
- Director’s Office
  - Office of Toxicology
  - Office of Emergency Response
- Associate Director’s Office
  - Office of Environmental Justice
  - Office of Community Relations
  - Office of Policy & Outreach
  - Office of Pollution Prevention
Figure 1. Population of the world, 1950-2050, according to different projections and variants

Population

- By 2050 70% of you will still be around
- World population growth per year: 75 M
- Food production will have to increase by 55% by 2030 to meet population need
<table>
<thead>
<tr>
<th>States</th>
<th>Density</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Population</td>
</tr>
<tr>
<td>1. Illinois</td>
<td>223.4</td>
</tr>
<tr>
<td>2. Iowa</td>
<td>52.4</td>
</tr>
<tr>
<td>3. Indiana</td>
<td>169.5</td>
</tr>
<tr>
<td>4. Ohio</td>
<td>277.3</td>
</tr>
</tbody>
</table>
The neighborhood is changing
Regulations

- Clean Water Act
  1. Gulf Hypoxia: Nitrates & phosphorous
  2. Pesticide application
  3. Waters of the U.S.
Clean Air Act
1. Particulate Matter
2. CO2
3. Greenhouse gases
## Total Imports of Petroleum (Top 15 Countries)
(Thousand Barrels per Day)

<table>
<thead>
<tr>
<th>Country</th>
<th>Aug-09</th>
<th>Jul-09</th>
<th>YTD 2009</th>
<th>Aug-08</th>
<th>YTD 2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>CANADA</td>
<td>2,524</td>
<td>2,639</td>
<td>2,459</td>
<td>2,247</td>
<td>2,473</td>
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<tr>
<td>MEXICO</td>
<td>1,159</td>
<td>1,316</td>
<td>1,265</td>
<td>1,401</td>
<td>1,318</td>
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<tr>
<td>VENEZUELA</td>
<td>1,070</td>
<td>959</td>
<td>1,138</td>
<td>1,305</td>
<td>1,207</td>
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<tr>
<td>NIGERIA</td>
<td>917</td>
<td>879</td>
<td>735</td>
<td>1,166</td>
<td>1,066</td>
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<tr>
<td>SAUDI ARABIA</td>
<td>766</td>
<td>1,153</td>
<td>1,053</td>
<td>1,573</td>
<td>1,556</td>
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<tr>
<td>ALGERIA</td>
<td>551</td>
<td>329</td>
<td>473</td>
<td>530</td>
<td>526</td>
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<tr>
<td>RUSSIA</td>
<td>512</td>
<td>637</td>
<td>621</td>
<td>490</td>
<td>491</td>
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<tr>
<td>IRAQ</td>
<td>500</td>
<td>365</td>
<td>461</td>
<td>663</td>
<td>675</td>
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<tr>
<td>ANGOLA</td>
<td>364</td>
<td>320</td>
<td>494</td>
<td>495</td>
<td>523</td>
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<tr>
<td>BRAZIL</td>
<td>275</td>
<td>392</td>
<td>350</td>
<td>208</td>
<td>245</td>
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<tr>
<td>COLOMBIA</td>
<td>269</td>
<td>305</td>
<td>284</td>
<td>257</td>
<td>210</td>
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<tr>
<td>UNITED KINGDOM</td>
<td>225</td>
<td>188</td>
<td>248</td>
<td>222</td>
<td>218</td>
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<tr>
<td>VIRGIN ISLANDS</td>
<td>223</td>
<td>273</td>
<td>291</td>
<td>298</td>
<td>326</td>
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<tr>
<td>NETHERLANDS</td>
<td>160</td>
<td>118</td>
<td>144</td>
<td>143</td>
<td>163</td>
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<tr>
<td>KUWAIT</td>
<td>148</td>
<td>261</td>
<td>182</td>
<td>203</td>
<td>208</td>
</tr>
</tbody>
</table>

**Note:** The data in the tables above exclude oil imports into the U.S. territories.
US Land

- Active farmland; 350 million acres
- Corn = 93 million acres
- Soy = 64 million acres
- Wheat = 60 million acres

- Grass = 587 million acres
- Forest = 650 million acres
- Urban = 60 million acres
- Total US acres 2,264 million acres

David Brune, University of Missouri
Biomass

- Definition
- Process waste
Energy Independence

85% Ethanol
Ethanol Plants

- Water efficiencies
- CHP
- Energy efficiencies
Energy Independence
Current and Planned Wind Capacity by State

**Energy Independence**

- **Algae**
  1. Exxon
  2. Emissions

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**Biofuels from Algae**

- Rapid growth rate
  - Double 6-12 hours
- High oil content
  - 4-50% non-polar lipids
- Biomass harvested
  - 100%
- Harvest interval
  - 24/7, not seasonally

- 4-50% Lipid biomass
- 50-90% Other biomass
Carbon Markets

- Illinois Conservation Climate Initiative
  www.illinoisclimate.org

- AgraGate
  www.agragate.com

- National Farmers Union
  www.carboncredit.ndfu.org
Carbon Aggregation

- Started in 2005 with a $20,000 grant from the Illinois EPA.
- Created the Illinois Conservation and Climate Initiative and formed an innovative partnership with the State of Illinois, state agencies, SWCDs, and a wide-ranging advisory committee.
- Has expanded into Michigan with a similar program, and into 14 other states.
- Have returned over $2 million in revenue to enrollees.
- Developed new CCX protocol for Sustainably Managed Forests, as well as new applications of Energy Efficiency and Ozone-Depleting Substance Destruction Protocol.
Market Based Conservation

Stacking environmental attributes
- Carbon
- Nutrient
- Ecological

Market based conservation
Timeline: blue > technology application
tan > carbon price
Livestock

- Lookout cow
Methane
Slurry Store
Expanding pesticide technology: half life
Plant genetics: resistances
Agronomics: root mass
Precision nutrient technologies: anhydrous ammonia
Drainage best management practices: bio-chambers
Machinery

- Auto steer: no overlap
- Engine technology: cleaner engines
- Mulch tillage: keeping soil in place
Applications

- Composting
- Gasifiers
- DeAnza > http://www.deanzafuel.com/
- Encapsulation:
  - Ostara > http://www.ostara.com/
  - Calera > http://www.calera.com/
- Wind Power: Storage
- Sustainable farms
The New Business Environment

5 BUSINESS REASONS TO MEASURE AND MANAGE CARBON

- Manage Business Risk
- Develop Sustainable Brand Identity
- Customer Demands
- Business Performance Specifications
- Current and Future Regulations

Making GREEN Work for Business™
Policy

Sustainability Overview

The three pillars of sustainable development, from left to right, the theory, the reality and the change needed to better balance the model.

Contact Information

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