GASOLINE FROM MOTORBOATS IN NEW YORK LAKES

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Canandaigua Lake
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NYDEC

photo courtesy of CommunityPictures.org
Questions:

Are lakes contaminated with gasoline?

If so, do motorboats contribute significantly to this contamination?
Sources of Hydrocarbons

- atmospheric
- runoff
- groundwater
- direct emission

*#$%@%& stinkpot!
Primary Study Sites:

Lake George
Canandaigua Lake
Onondaga Lake

Auxiliary Sites:

Cayuga Lake (my dock)
Oneida River (friend’s dock)
Sampling rate = 3.6 L/day (summer, Onondaga Lake)
Lake George at Bolton Landing
PISCES sample
July, 2001 (GC-MS)

styrene

Gasoline (GC-MS)
Lake George – July, 2001

$m+p$-xylene

\[
\begin{align*}
\text{\textmu g accumulated} \\
0 & \quad 30 & \quad 60 \\
\end{align*}
\]

Map of Lake George with locations labeled:
- Bolton Landing
- Dome Island
- The Narrows
- Lake George Village
- Lamb Shanty Bay
Lake George - 2001
at Lake George Village

$m+p$ Xylene

\[ \mu g \text{ accumulated} \]

- May
- July
- October
Canandaigua Lake

4 sites
1-week contiguous deployments
spring-fall, 2001
Canandaigua Lake – 2001
Total Xylenes - Weekly Average

Date sampler recovered (2001)

μg/L

NYSWQ Std

channel

beach

west

east
Canandaigua Lake – 2001
Total Gasoline (est.) - Weekly Average

Date sampler recovered (2001)
Onondaga Lake
The Fishing Derby

photo courtesy of
CommunityPictures.org

algae courtesy of our nutrients
ONONDAGA LAKE
Fishing Derby - 2001

Before Derby (July 25 – Aug. 1)

During Derby (August 1 – 8)

After Derby (August 8 – 16)
$\approx 20 \mu g/L$ of gasoline (1-week average)

$\approx 150 - 900$ gal. of gasoline
Conclusions:

- Gasoline is the major (mass) organic contaminant in recreational waters
- Gasoline is heterogeneous in time and space
- Motorboats are the major source of gasoline in recreational waters
- Concentrations of individual components may exceed water quality standards
WHAT TO DO?
EPA-Estimated Average Hydrocarbon Emission Factors for Marine Engines

<table>
<thead>
<tr>
<th>type</th>
<th>g/kw-hr</th>
<th>75 hp (gal/hr)</th>
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</thead>
<tbody>
<tr>
<td>2-stroke carburetor</td>
<td>137</td>
<td>4.5</td>
</tr>
<tr>
<td>2-stroke PWC</td>
<td>225</td>
<td>7.3</td>
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<tr>
<td>2-stroke injector</td>
<td>27</td>
<td>0.87</td>
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<tr>
<td>4-stroke</td>
<td>11</td>
<td>0.36</td>
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<tr>
<td>4-stroke PWC</td>
<td>17</td>
<td>0.55</td>
</tr>
</tbody>
</table>
Get a clean motor

OR

Row
Go sailing!
thanks to:

Canandaigua Lake Pure Waters
Canandaigua Lake Watershed Council
Onondaga Lake Partnership
Onondaga Lake Cleanup Corp.
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