

# Green Chemistry

A new approach to pollution prevention in  
the Great Lakes

May 13, 2010



**Great Lakes  
Green Chemistry  
Network**

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*Addressing Great Lakes Challenges  
with Green Chemistry Solutions*

# What is “Green Chemistry”?

Green chemistry is an approach to the design, manufacture and use of chemical products to intentionally reduce or eliminate chemical hazards. The goal of green chemistry is to create better, safer chemicals while choosing the safest, most efficient ways to synthesize them and to reduce wastes



## 12 Principles of Green Chemistry

1. Pollution Prevention
2. Atom Economy
3. Less Hazardous Chemical Synthesis
4. Designing Safer Chemicals
5. Safer Solvents and Auxiliaries
6. Design for Energy Efficiency
7. Use of Renewable Feedstocks
8. Reduce Derivatives
9. Catalysis
10. Design for Degradation
11. Real-time analysis for Pollution Prevention
12. Inherently Safer Chemistry for Accident Prevention



**All Green Chemistry is inherently  
Pollution Prevention  
but not all  
Pollution Prevention  
is GREEN CHEMISTRY**

**The goal of green chemistry is to *eliminate*  
the hazard from commerce, not only to  
apply P2 to the engineering practices that  
*produce* them.**



# The Great Lakes Green Chemistry Network

Creating Partnerships and collaboration between  
academia, industry, government, labor, and non-  
governmental agencies to promote the principles  
and practice of green chemistry in the binational  
Great Lakes Region



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# The Great Lakes have a long history in contributing to the understanding of the impacts of toxic chemicals.

- Seminal studies on the impacts of DDT and PCBs on wildlife and humans
- Theo Colborn – *Great Lakes, Great Legacy*
- The Wingspread Statement on endocrine disrupting chemicals



**The challenge of toxics in the Great Lakes is in dealing both with the threats of new chemicals contamination as well as addressing and remediating legacy contamination.**

**Green Chemistry can play an important role in both.**



**The Great Lakes Green Chemistry Network was founded in 2006 to promote the growth of green chemistry in the Great Lakes and to facilitate the use of green chemistry in addressing Great Lakes toxics challenges.**



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- The Michigan Green Chemistry Program was created by Executive Directive, No. 2006-6, which also established a Green Chemistry Roundtable within the State of Michigan. Its goal is to promote green chemistry for sustainable economic development and protection of public health.

• [http://www.michigan.gov/deq/0,1607,7-135-3585\\_49005---,00.html](http://www.michigan.gov/deq/0,1607,7-135-3585_49005---,00.html)



- Green chemistry efforts are underway throughout the binational Great Lakes Region including the funding of GreenCentre Canada, and green chemistry programs at universities.
- Tools for promoting alternatives assessment are growing in number, such as the Green Screen
- Rising awareness of the need to incorporate alternatives assessment and green chemistry in policy.



- The Great Lakes Green Chemistry Network is a resource for information about Green Chemistry
  - Web site: [www.glgc.org](http://www.glgc.org)
  - Monthly free telephone seminars with experts in green chemistry science, policy, industry, and work in labor and the not-for-profit sector
    - Rui Resendes, Executive Director, GreenCentre Canada
    - Phil Jessop, Queens University, Kingston
    - Theo Colborn, The Endocrine Exchange
    - James Clark, The Green Chemistry Network, York, UK



- Participation in policy making processes in the U.S. and Canada
- Blogging on green chemistry issues
- Student Green Chemistry Network
- Presentations at conferences, meetings



## Resources:

**Great Lakes Green Chemistry Network**

[www.glgc.org](http://www.glgc.org)

**The Louisville Charter for Safer Chemicals**

<http://www.louisvillecharter.org/>

**Beyond Benign** [www.beyondbenign.org](http://www.beyondbenign.org)

**GreenCentre Canada**

[www.greencentrecanada.com/](http://www.greencentrecanada.com/)

**Advancing Green Chemistry**

[www.advancinggreenchemistry.org](http://www.advancinggreenchemistry.org)

