

Teacher Leadership – Environmental Issues: Focus on Water

Chicago Teacher Transformation Institutes (CTTI) – Summer 2011

Course Description

The purpose of this 5-week summer course for high school science teachers is to develop an integrated understanding of the water system as a fundamental support for global energy and material cycles, ecosystems, and human society. The topic will be approached from a variety of points of view: chemistry, physics, biology, engineering, technology, policy. The chemical and physical properties of water and the basic principles of aquatic chemistry will be reviewed. The hydrologic cycle will be discussed in depth. Water quality, quantity, pollution and treatment will be covered. Students will explore the limits of global water resources, aquatic biodiversity, and the struggle for water among competing interests (nature, cities, agriculture, industry, energy, etc.). We will read excerpts of recent books written on the subject of water (*The Big Thirst* by Charles Fishman & *WATER: The epic struggle for wealth, power and civilization*) in order to investigate the role of water in urban development (e.g. Chicago, New Orleans, Las Vegas), water & energy, water & climate change. The course will include laboratory exercises and a field trip (e.g., Shedd aquarium, wetland, water treatment plant, or sustainable community). Finally, strategies that promote the sustainable use of water will be discussed, with special attention to how they could be applied to a future Chicago.

Week 1

Class 1 – Introduction; Chemical & physical properties of water; Basics of aquatic chemistry; Laboratory exercise

Class 2 – Aqueous System (cell, organism, ecosystem); The Hydrologic Cycle and Processes; Lab exercise

Week 2

Class 3 – Water quantity and quality, water pollution, water treatment (natural and engineered; low tech/high tech); demonstration

Class 4 – Aquatic biodiversity – The oceans, The Great Lakes

Week 3

Class 5 – Global water resources; Water management; Competing demands for water by ecosystems, cities, agriculture, industry, energy, etc.

Class 6 – Case Studies - Water – Chicago vs. New Orleans; The Mississippi River system, Hypoxia and Gulf of Mexico; Water & energy security

Week 4

Class 7 – Water policy; Clean Water Act; Clean up and restoration; The Great Lakes, Areas of Concern, Legacy Contaminants, Public Health.

Class 8 – Field Trip

Week 5

Class 9 – Discuss *The Big Thirst: The Secret Life and Turbulent Future of Water* (Charles Fishman, 2011, Free Press); *WATER: The Epic struggle for wealth, power and civilization* (Steven Solomon, 2010, Harper).

Class 10 – Sustainability & Water; Future Vision for Sustainable Water Use in Chicago.