

# BOOKLET

2010

Indiana Envirothon



Academic  
Teams

FFA Teams

Scout  
Teams

4-H Teams

Green Club  
Teams

The Indiana Association of  
Soil and Water Conservation Districts  
& the Hoosier National Forest are proud to sponsor  
Indiana Envirothon

[http://www.iaswcd.org/district\\_tools/envirothon.html](http://www.iaswcd.org/district_tools/envirothon.html)

Indiana Envirothon  
Ann Ice  
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Non-Profit Organization  
Bulk Rate  
U.S. Postage  
PAID  
Princeton, IN 47670  
Permit No. 118

Attn: AG Dept, Science Dept, Academic Teams, Environmental Clubs,  
Home Schools, 4-H Clubs, Boy Scouts, Explorer Scouts, Girl Scouts

## What is the Indiana Envirothon?

The Indiana Envirothon promotes environmental education to high school aged students. The goal is to raise awareness of the importance of achieving and maintaining a natural balance between the quality of life and of the environment.

In-class curriculum is combined with hands-on field experiences to demonstrate the role people have in important environmental issues. Envirothon is an exciting, fun way for high school students to learn about the environment and the issues facing current and future generations.

At the completion of each contest, students are tested on five subjects: soils/land use, aquatic ecology, wildlife, forestry and a current environmental issue, which changes each year.

Envirothon builds awareness. It helps show tomorrow's leaders the positive and negative effects individual actions have on the environment. Youth who take part understand differences between renewable and nonrenewable resources, understand environmental interactions and interdependencies, and know who provides information that can be used in the future for their benefit.

Students have fun while becoming environmentally aware during the competition!

## How Envirothon Works

Teams of five students (grades 9-12), representing a school or organization, compete at Indiana Envirothon Contests by answering questions and by studying resource problems in each of the five environmental areas which include: soils/land use, aquatic ecology, wildlife, forestry, and a current environmental issue changed annually.

Students begin training for Envirothon by studying the resource materials that cover each natural resource area and those objectives related to them. Natural resource professionals speak to teams on a rotating basis during the Regional contests. Job experiences and information pertaining to the resource areas will be taught. The teams are given tests covering the five resource areas. **The top 3 teams from each Regional contest** will be invited to compete at the Indiana State Envirothon contest.

17. In the event a procedural dispute or question that is not covered in this information or in its addendum, the issue will be decided by the Indiana Envirothon Appeals Committee.
  18. Participants must sign a code of conduct.
  19. Code of conduct forms, photo/video release, & medical release for each student must be received the day of contest.
  20. **Possession or use of cell phones or other electronic devices by students at any Envirothon contest is prohibited. Advisors may hold these items or they may be left in backpacks or locked vehicles.**
- \*Non-adherence to these rules may prevent a team from placing.**

## Indiana Envirothon Committee Members

### Indiana Academic Standards

The following Indiana Academic Standards are taken into consideration in the construction of Indiana's Envirothon Competition and are covered in part or fully at each contest.

#### Principles of Earth and Space Science

ES.1.10, ES.1.12, ES.1.18, ES.1.20, ES.1.21, ES.1.22, ES.1.25, ES.1.26, ES.1.27, ES.1.29

#### Principles of Environmental Science

Env.1.1, Env.1.2, Env.1.3, Env.1.4, Env.1.5, Env.1.7, Env.1.8, Env.1.9, Env.1.10, Env.1.11, Env.1.12, Env.1.14, Env.1.15, Env.1.18, Env.1.19, Env.1.20, Env.1.21, Env.1.26, Env.1.27, Env.1.28, Env.1.29, Env.1.34, Env.1.35

#### Principles of Biology

B.1.15, B.1.16, B.1.17, B.1.18, B.1.19, B.1.29, B.1.31, B.1.32, B.1.34, B.1.36, B.1.37, B.1.38, B.1.39, B.1.40, B.1.41, B.1.42, B.1.43, B.1.44, B.1.45, B.1.46, B.1.47, B.2.1, B.2.2, B.2.3

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## **Rules & Information\***

1. Students in grades 9-12, as of the 2009-2010 school year, are eligible to be contestants.
2. **Teams must consist of five contestants.** One alternate is **highly recommended** & can be brought per team. **Alternates cannot be in testing area.**
3. Schools or organizations may participate in only one regional competition annually.
4. Registration fee is \$60 for each team. Fee covers lunches for six (6) students and one (1) advisor. Each additional person brought will be charged an \$8 fee per person. Lunch will be provided.
5. A school or organization may send up to two (2) teams to regional competition. Teams from the same school must participate in the same regional competition.
6. Coaches may accompany their teams during the resource presentations at Indiana Regional Contests. **Coaches are not to accompany team to any testing area including the Hands-on Tour during the Indiana State Envirothon Contest.**
7. A pre-designated time will be allowed at each station for resource presentations.
8. Notes may be taken during each resource presentation, but will be collected prior to the testing period. Please bring your own materials for note-taking.
9. Contest will consist of 20 questions per test. (100 questions total)
10. All tests will be given at one time after teams have rotated through all five (5) resource presentations.
11. Test questions will cover information in the suggested reference materials listed.
12. Team members work together to answer test questions, submitting one completed test per team for each resource subject.
13. With respect to test questions, the decision of the Indiana Envirothon Test Committee is final.
14. Regional competitions are limited to the first 25 teams who register by post-mark per site.
15. The top three teams in each regional competition are eligible to compete at the state competition. **In case of a tie a randomly selected test will be used to determine the teams placement. If all 5 test scores are the same a randomly selected question will be selected.**
16. The state winner is eligible to compete at the Canon® Envirothon. If the state winner cannot participate, the next place team may represent Indiana at the Canon® Envirothon competition.

At the Indiana State Envirothon contest, the top 3 teams from each regional contest will be provided a natural resource situation relating to the current environmental issue. Each team shall conduct an oral presentation to a panel of judges.

The top team from the State contest will represent Indiana in the Canon® Envirothon contest. The Canon® Envirothon is a multi-day event. In 2009, the contest was held in Asheville, North Carolina. Over 50 participating teams from the U.S. and Canada, merged the knowledge from their home state/provincial contests with hands-on teaching stations during this seven day contest. Written tests and presentations were again part of the contest.

## **Awards & Recognition**

1. All participants receive participation certificates.
2. The top three placing teams at a regional event will receive medals for each **of the five** students on the team. The top teams will receive a plaque for their school.
3. At the Indiana Envirothon State contest, medals will be given to the top three placing teams in each of the following categories: written tests, oral presentation and overall. Plaques will also be given out for the top three teams and their schools. A traveling trophy will be given to the top overall team in the Indiana State contest.
4. The team representing Indiana at the Canon® Envirothon competition will have registration and housing fees paid for by the Indiana Envirothon Committee. **Travel expenses are the responsibility of the winning team.** A portion of the expenses incurred MAY be reimbursed by Indiana Envirothon. Teams that place in the top 15 receive prizes from Canon® and the students of the top three teams will receive scholarships.

**\*Please Note: Websites for recommended references are often updated on a yearly basis. Please do not rely on previous year's printouts for website references.**

**\*Students should be able to relate all resource topics (soil/land use, aquatics, forestry, wildlife) to the Current Issue.**

## **2010 Contest & Dates**

Teams will be assigned to contest site of their choice if space is available, based on a first registered basis. Regional Coordinator reserves the right to cancel contest if registration numbers are inadequate by mid-February.

## **Regional Contests**

### **South Central ~ Thursday, March 11th**

Lawrence County 4-H Fairgrounds (Bedford)

Coordinator: Rebecca Lauster (rebecca.lauster@in.nacdn.net)

### **Central ~ Monday, March 15th**

Symbiosis in Waldron (Shelbyville)

Co-coordinators: Ashley Carlton (ashley.carlton@in.nacdn.net)

Jill Williams (jill.williams@in.nacdn.net)

### **East Central ~ Tuesday, March 16th**

Kuhlman Center, Wayne Co. Fairgrounds (Richmond)

Coordinator: LuAnne Holeva (luanne.holeva@in.nacdn.net)

### **Southwest ~ Tuesday, March 16th**

SW Purdue AG Center (Vincennes)

Coordinator: Jeri Ziliak (jeri.ziliak@in.nacdn.net)

### **Southeast ~ Tuesday, March 16th**

St. Paul Lutheran Church in Olean (Versailles)

Coordinator: Katie Collier (katie.collier@in.nacdn.net)

### **North Central ~ Wednesday, March 17th**

Camp Buffalo (Monticello)

Coordinator: Darci Zolman (darci.zolman@in.nacdn.net)

### **Northwest ~ Thursday, March 18th**

Red Mill County Park (LaPorte)

Coordinator: Nicole Messacar (nicole.messacar@in.nacdn.net)

### **Northeast ~ Thursday, March 25th**

Merry Lea Environmental Center (Wolf Lake)

Coordinator: Julie Knudson (jknudson@co.dekalb.in.us)

## **2010 Indiana State Contest ~Tuesday, April 20th**

Beck Agricultural Center (West Lafayette, Indiana)

Coordinator: Rebecca Lauster (rebecca.lauster@in.nacdn.net)

## **2010 Canon® Envirothon Contest & Date**

University of California, Merced (Merced, CA)

Sunday through Sunday, August 1-August 7

See <http://www.envirothon.org> for details

## **2010 Current Issue “Protection of Groundwater through Urban, Agricultural and Environmental Planning”**

This topic was approved for 2010 by The Canon® Envirothon executive committee. The Current Issue objectives and resources below were then customized to Indiana and will be used to construct the Indiana Regional and State tests only. The team that wins the Indiana State Envirothon Competition and/or competes in The Canon® Envirothon will need to study additional objectives and resources specific to the California region.

<http://www.state.in.us/dnr/water/4083.htm>

<http://www.nrdc.org/globalWarming/hotwater/execsum.pdf>

<http://www.purdue.edu/dp/envirossoft/groundwater/src/ground.htm#toc>

[http://ncgia.ucsb.edu/conf/SANTA\\_FE\\_CD-ROM/sf\\_papers/navalur\\_kumar/my\\_paper.html](http://ncgia.ucsb.edu/conf/SANTA_FE_CD-ROM/sf_papers/navalur_kumar/my_paper.html)

[http://www.sierraclub.org/toxics/Leaking\\_USTs/factsheets/indiana.PDF](http://www.sierraclub.org/toxics/Leaking_USTs/factsheets/indiana.PDF)

<http://usc-canada.org/UserFiles/File/WaterFootprintOfBiofuels.pdf>

<http://www.in.gov/dnr/water/files/watshplan.pdf>

<http://www.in.gov/dnr/water/4859.htm>

<http://pubs.usgs.gov/circ/2003/circ1247/pdf/Circ1247.pdf>

<http://igs.indiana.edu/geology/karst/karstInIndiana/karstInIndiana04.cfm>

<http://www.in.gov/dnr/outdoor/files/chap4.pdf>

<http://www.occeweb.com/MARC2008/MARC%20LINEUP.htm>

Mike Hightower's PowerPoint

### **Indiana Current Issue Learning Objectives:**

1. Identify the two greatest uses of fresh water in Indiana and explain why conjunctive use of groundwater and surface water is important to ground water management and optimizing supply?
2. Know the sources of pollution to groundwater in Indiana and strategies for improving groundwater quality.
3. Evaluate the impact of energy production (power plants, the production of bio fuels, and the refining of fossil fuels) on fresh water supplies.
4. Understand the criteria for policies to protect and manage groundwater resources for humans, the environment, economic needs, and energy production. Be able to differentiate the different roles that government agencies in Indiana have in protecting and managing groundwater as well as how water use is regulated at the state and federal level.
5. Understand the value of groundwater as a component of integrated regional water management plans, and know strategies to increase and replenish groundwater supplies.
6. Know how Indiana monitors groundwater levels.
7. Be able to analyze the impact of over pumping groundwater and explain why land use planning is necessary for groundwater management. Understand management practices for water conservation and water use efficiency as part of a groundwater management plan in both an urban and rural/agricultural watershed.
8. Understand the hydrologic relationship and the environmental benefits of groundwater and surface water.
9. Know how global warming affects water supplies.
10. Be able to explain why Indiana's karst topography has unique challenges for managing groundwater.
11. Understand how Indiana's wetlands contribute to groundwater protection.
12. Be familiar with the concept of water resource assessments (basin studies) & if your region of the state has done a comprehensive watershed report.

**Aquatic Ecology References:**

1. ***Volunteer Stream Monitoring Training Manual*** by Hoosier Riverwatch, current edition. This manual is available for download and printing at: <http://www.in.gov/dnr/nrec/3013.htm> (Riverwatch Training Manual only)
2. <http://water.usgs.gov/education.html> USGS Water Resources of the United States. All links under *Water Resources for Students and Teachers and Education Materials Provided By National Partner Organizations*
3. <http://education.usgs.gov/common/secondary.htm#water> the section on Water is near bottom of webpage
4. <http://www.rivernetwork.org/stories-alerts> All River Network Stories
5. <http://www.epa.gov/bioiweb1/aquatic/freshwater.html> EPA: Freshwater Ecosystems
6. <http://www.iaswcd.org/story/implementation/index.html> IASWCD District Stories of Conservation Improvement
7. <http://clean-water.uwex.edu/pubs/pdf/wav.wwwc.pdf> The Ohio Wacky Water Critters
8. <http://clean-water.uwex.edu/pubs/pdf/wav.riverkey.pdf> Macroinvertebrate Life in the River
9. <http://clean-water.uwex.edu/pubs/pdf/wav.pondkey.pdf> Key to Life in the Pond
10. <http://groundwater.org/kc/kc.html> The Groundwater Foundation Kids Corner—section on Groundwater Basics and Sample Activities
11. <http://www.iaswcd.org/icp/index.html> Know the conservation partnership members as well as their focus and outcomes

**Aquatic Ecology Objectives:**

1. Identify assisting agencies and laws that govern Indiana waters, and develop a working understanding of the programs which benefit our water resources
2. Define a watershed and the interaction of the components
3. Define and determine types of non-point source and point source water pollution
4. Recognize types of water pollution (organic, inorganic, thermal, toxic, etc.) and the impacts of each on water quality
5. Recognize behaviors within urban, rural, agricultural, and industrial regions that affect a watershed, and if negative, determine what mitigating actions are needed
6. Identify aquatic organisms and their indication of aquatic health
7. Differentiate between complete and incomplete metamorphosis and be able to classify aquatic insects by feeding and pollution tolerance groups
8. Understand how a wetland functions as an ecosystem, while also serving to improve water quality
9. Understand the factors that influence the ecology of a river (land form, energy levels, vegetation, velocity, etc.)
10. Be able to conduct and interpret data for measuring water quality
11. List safety factors that must be taken for sampling and conducting water quality tests
12. Identify the seven major groups of organisms known to inhabit freshwater ecosystems and which species are at-risk
13. Understand the unique characteristics of freshwater resources (lakes and ponds, rivers and streams, reservoirs, wetlands, and groundwater) in the United States

**Wildlife References:**

1. ***American Wildlife & Plants: A Guide to Wildlife Food Habits.*** Martin, Alexander C., Zim, Herbert S. and Nelson, Arnold L., Mineola, NY, USA: Dover Publications, Inc., 1951 to present reprints. ISBN: 0486207935.
2. <http://www.ces.purdue.edu/extmedia/fnr.htm> (downloadable and printable items within the Wildlife section.)
3. <http://www.djcase.com/incws/indianacws.htm> Indiana Conservation Wildlife Strategy (not appendices or 8 required elements)
4. [http://www.dnr.state.oh.us/Home/species\\_a\\_to\\_z/speciesguide\\_default/tabid/6491/Default.aspx](http://www.dnr.state.oh.us/Home/species_a_to_z/speciesguide_default/tabid/6491/Default.aspx) (Ohio DNR site Species A To Z Guide) Select sections on birds, mammals, fish, and reptiles & amphibians
5. ***Animal Tracks of Indiana;*** Tamara Eder; Lone Pine Publishing, 2001; ISBN: 1-55105-307-1
6. <http://www.in.gov/dnr/fishwild/5471.htm> (sections on Endangered & Threatened Wildlife-Wildlife Diversity Section, Invasive Species Information, Wildlife Health, Species Information)

**Wildlife Objectives:**

1. Identify assisting agencies, programs, and laws that govern Indiana wildlife
2. Identify the tracks, physical characteristics, movement patterns, and eating habits of common Indiana mammals, birds, fish, and herptiles (reptiles and amphibians)
3. Differentiate between extinct, extirpated, endangered, threatened, & species of special concern & recognize Indiana species in each category
4. Differentiate between game and non-game species, and recognize Indiana species in each category
5. Differentiate between habitat and niche and be able to give an example of each
6. Describe the habitat of Indiana mammals, birds, fish and herptiles and recommend management practices for each habitat
7. Have a working knowledge of how to approximate the age of mammals by physical characteristics
8. Differentiate between herbivores, carnivores, and omnivores
9. Understand and illustrate a food web or energy flow diagram containing examples of Indiana producers, consumers, and decomposers
10. State the distinguishing characteristics of the mammal, bird, fish, and reptile & amphibian (herptiles)
11. Determine whether a snake is poisonous or non-poisonous
12. Define the theory of natural selection and recognize instances where wildlife has adapted to changes in the environment
13. Have a working understanding of migration pathways of migratory birds as it relates to Indiana

### Forestry References:

1. <http://www.ces.purdue.edu/extmedia/menu.htm> Scroll down to FORESTRY & NATURAL RESOURCES. Be familiar with all of FOREST MANAGEMENT section. Also be familiar with the following: under GENERAL FORESTRY "Wood from Midwestern Trees" (FNR 270), under HARDWOOD LOG, LUMBER & VENEER MANUFACTURING "Some Important Indiana Hardwoods Their Characteristics & Uses" (FNR 27) & "How to Identify Some Common Indiana Woods" (FNR 43), under WOOD FOR FUEL "Wood for Home Heating" (FNR 79), and under TIMBER MARKETING "How to Make and Use the Tree Measuring Stick (FNR 4) *The paper template for the tree measuring stick must be picked up at a Purdue Extension Office*
2. <http://www.in.gov/dnr/forestry> Select the Publications tab. Resources include all Stewardship Notes, Forest Resource Management, and Community & Urban Forestry items that are underlined and printable.
3. **50 trees of Indiana**, T.E. Shaw, Purdue publication 4-H-15-80  
Call your Purdue 4-H Extension Agent or 1-888-EXT-INFO.
4. **101 Trees of Indiana**, Marion Jackson, Indiana University Press.  
ISBN 0-253-21694-X
5. <http://www.wvu.edu/~exten/depts/af/ahc/forestpl.pdf>
6. <http://forestry.msu.edu/extension/ExtDocs/NCR478.pdf>
7. <http://forest.wisc.edu/extension/publications/78.pdf>

### Forestry Objectives:

1. Determine where landowner assistance may be obtained for tree planting, forest management, harvesting activities, & tree planting/landscaping guidelines
2. Define common forestry measurement terms such as basal area, board foot, chain, cord, rick, etc.
3. Identify any tree species listed in reference materials when given leaf, twig, bark, seed, fruit, wood sample and/or habitat type
4. Prescribe forest management practices when given the landowner's objective(s) or a specific production goal for the forested area
5. Be able to prepare a tree planting plan for various objectives such as hardwood production, windbreak, wildlife habitat, erosion control, watershed protection, or urban/suburban settings
6. Be able to understand and properly use a Biltmore stick (tree measuring stick) to determine tree diameter, number of logs, & board feet in a tree or cut log
7. Identify the uses of native Indiana trees and shrubs
8. Develop a working understanding of forest health and management issues such as biological diversity, forest fragmentation, air quality, aesthetics, fire, global warming, and recreation
9. Determine the best suited tree species for a given site and be familiar with various effective planting methods
10. Define common forestry management and ecological terms such as canopy, climax, succession, regeneration, etc.
11. Explain & be able to diagram an example of succession for any area of Indiana
12. Recognize common insects, diseases, and species susceptibility of trees in forested and urban settings
13. Be able to define and diagram the parts of a tree
14. Be able to use a dichotomous key or other type of tree identification key
15. Develop a working understanding of best management practices as well as other factors (economic, social, ecological, etc.) that influence management decisions pertaining to forests, riparian areas, urban settings, and homeowner properties

### Soils/Land Use References:

1. **Indiana Soils: Evaluations and Conservation** Extension Publication ID-72 (7-01) Available at 1-888-EXT-INFO or contact your local Purdue University Cooperative Extension Service office.
2. **Soil Science Simplified**, 4<sup>th</sup> Edition, Helmut, Kohnke & D.P. Franzmeier, ISBN 0-88133-813-3 Publisher: Waveland Press, Inc. PO Box 400, Prospect Heights, Illinois 60070 Tel. 847-634-0081
3. <http://soils.usda.gov/sqi/publications/files/sustain.pdf>
4. <http://www.soil.ncsu.edu/publications/Soilfacts/AG-439-09/>
5. <http://www.ces.purdue.edu/extmedia/WQ/WQ-20.html>

### Soils/Land Use Objectives:

1. Identify assisting agencies, and have a working knowledge of the programs that assist land users with soil issues
2. Understand the roles of the five soil forming factors (time, native vegetation, topography, parent material, and climate)
3. Define and be able to determine a soil's texture
4. Explain why soils vary in color and where soil color determinations have practical application
5. Differentiate between soil horizons based upon the physical characteristics of color, texture, structure, and parent material, etc. when given a soil profile
6. Recognize blocky, platy, granular, prismatic, or columnar soil structures; and single grain or massive structure-less soil within a soil profile
7. Describe the influence of particle size upon soil chemical activity.
8. Differentiate between native forest, native prairie, and natural wetland soils
9. Delineate the boundaries of the Kansan, Wisconsinan and Illinoian glaciers in the Midwest
10. Use a slope measuring device to determine the percent of slope for a given area, in order to make land use recommendations
11. Differentiate between sheet, rill and gully erosion and identify practices to correct these problems
12. Use a soil survey and/or soil characteristics to determine appropriate land uses
13. Understand how soils interact with their current environments, their degradation and how to minimize this degradation, while protecting all other resources