

Activities

January 2009

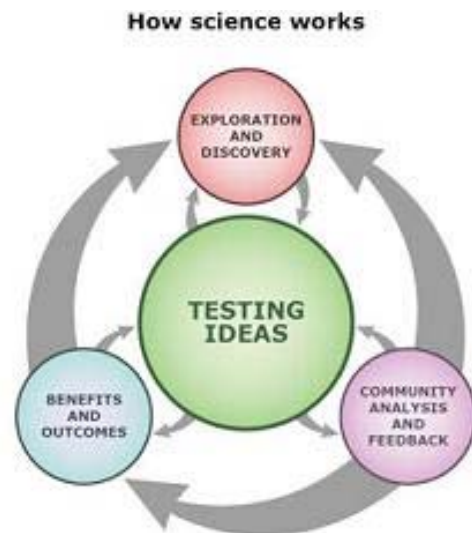
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Research Highlight

YEAR of SCIENCE 2009 Explore. Empower. Engage...

The Year of Science kicked off nationally at “launch events” at the annual meeting of the Society for Integrative and Comparative Biology in Boston, on NPR’s Talk of the Nation: Science Friday, and with the unveiling of the Understanding Science Web site and its new paradigm for portraying the process of science (figure at right). The new paradigm differs from the linear, static process of science that most of us were taught (hypothesis, experiment, data, analysis, restate hypothesis). See the attached page for FAQs and more details on the process of science.

Unit Leader Dr. Charles R. Berry, Jr., is promoting Year of Science information in South Dakota, at South Dakota State University (SDSU), and within the American Fisheries Society (AFS). The value to the Unit’s program is through improved education of Unit students about the process of science and an understanding of how their activities as scientists influence the public understanding of science. Unit scientists and students strive to have their work published in peer-reviewed journals.



Research Accomplishments

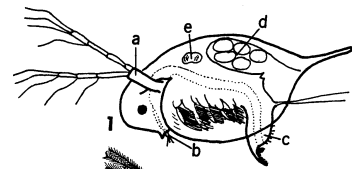
Walleye responded to rainbow smelt (figure) population decline and liberalized angling regulations. Walleye ate less smelt after smelt populations declined and walleye energy intake declined also. The walleye population declined because of increased fishing mortality and increased natural mortality. Assistant Unit Leader Dr. Steven R. Chipps coauthored a paper with Dr. Brian Graeb and others; the paper was just published in an AFS book (see publication list below).



Early life history of pallid sturgeons was the topic of a meeting between Chipps, Rob Klumb (U.S. Fish and Wildlife Service), and U.S. Army Corps of Engineers staff to discuss research needs for pallid sturgeon in the Missouri River. Chipps is a co-principle investigator on collaborative research efforts to document early life-history characteristics of pallid sturgeon.

Lake Sturgeon in Voyageurs: Stephanie Shaw (M.S. student) and Chipps summarized movement and distribution data for lake sturgeon in Voyageurs National Park. Preliminary data and maps were provided to the National Park Service staff for public relations efforts.

Bureau of Reclamation reservoirs in North Dakota are being evaluated by Graduate Research Assistant (GRA) Michael Greiner under the direction of Chipps. Water quality data have been compiled; zooplankton identification is underway with water fleas (*Daphnia* sp., figure) dominating most samples in the spring.



Fluorometric analysis for chlorophyll has also begun. Mean values for nitrogen over five summer months (2008) ranged from 1.5-2.1 ppm, whereas mean values for total phosphorous ranged from 0.2-0.3. Nitrogen: Phosphorous (N:P) ratios can govern plankton communities; values of 5-10 N:P frequently leads to a community dominated by Cyanophyta (blue-green).

South Dakota Waterfowl Book: former Assistant Unit Leader Dr. Kenneth F. Higgins and Dr. K. C. Jensen have recruited authors for a book on South Dakota waterfowl hunting and waterfowl populations and habitat. Berry is writing a chapter on duck stamps and decoys.

North Dakota streams: seventy-three sites were sampled in North Dakota in 2008 – including Beaver, Cannonball, Grand, Heart, James, Knife, Little Heart, Little Muddy, Square Butte, Souris, and White Earth watersheds. Forty-one fish species (21,340 total individuals) were collected. Mr. James Ladonski has finished quality control on the fish identifications for about half of the samples and reports that our field identifications were very, very accurate.



Technical Assistance

To SDSU – Wildlife: Chipps participated in Department planning; serves as Library representative and chair of the Space and Use committee.

To SDSU – Wildlife: Berry began teaching Fish Biology (WL 592, WL 592L), which deals with the structure and function of fish; meets with four graduate students for two hours of lecture and two hours of laboratory each week. (Figure is an E. C. Escher titled “Fish”)



To South Dakota Academy of Science: Berry met with Academy President Nels Troelstrup to plan a session on the Year of Science at the annual meeting at Northern State University, April 3-4.

To University of Wisconsin: Chipps and Dan James (Ph.D. student) met with University of Wisconsin researchers (Dr. Bill Pilsbury) to discuss didymo sampling in the Black Hills. Dr. Pilsbury is working with Unit staff to help process and identify the diatom community in Rapid Creek.

To AFS: Chipps, and other colleagues (Drs. Mike Brown, Brian Graeb, Tom Lauer from Ball State University, and Steve McMullin from Virginia Tech), are co-organizers for an AFS Symposium entitled *Fisheries Education in the 21st Century: Accommodating Change*. The symposium will be held at the 2009 annual meeting of the AFS in Nashville, Tennessee.

To SDSU – Biology: Berry presented a guest lecture on Year of Science and Public Understanding of Science at the Biology and Ecology Seminar (BIOS 790) January 27.

Publications

Berry, C. 2009. Welcome to the Year of Science. *Water Resources Institute Water News* 5(1):1-3.

Graeb, B. D. S., S. R. Chipps, D. W. Willis, J. P. Lott, R. P. Hanten, W. Nelson-Stastny, and J. W. Erickson. 2008. Walleye response to rainbow smelt population decline and liberalized angling regulations in a Missouri River reservoir. Pp 275-292 in M. S. Allen, S. Sammons, and M. J. Maceina, editors. *Balancing Fisheries Management and Water Uses for Impounded River Systems*. American Fisheries Society Symposium, Bethesda, Maryland.

FAQs about Year of Science

What is the Year of Science 2009? A national, year-long celebration of science to engage the public in science and improve public understanding of how science works, why it matters, and who scientists are.

Why 2009? The Year of Science is being held on the 200th anniversary of the birth of Charles Darwin and Abraham Lincoln (Lincoln established the National Academy of Science and appointed the first Governor of the Dakota Territories). This is also the 400th anniversary of Galileo's first use of a telescope and Kepler's first publication on Laws of Planetary Motion. The year 2009 is the International Year of Astronomy and the International Year of Plant Earth (www.yearofplanetearth.org).

Who is organizing Year of Science? Members of the Coalition for the Public Understanding of Science (now about 700 nationally, with 14 in South Dakota). www.copusproject.org

Who is sponsoring the Year of Science? American Institute of Biological Sciences, Geological Society of America, National Science Teachers Association, University of California Museum of Paleontology. See the www.yearofscience2009.org for other sponsors.

How do I get involved? Simply register your organization at the web address above; its free with the obligation that you will help improve public understanding of science.

Is there information for educators? Yes, especially at www.UnderstandingScience.org where a new approach for teaching the nature of science is presented (the site is funded by the National Science Foundation).

The simplified, linear scientific method implies that scientific studies follow an unvarying, linear recipe leading to a conclusion, and are done by an individual who follows those steps leaves little room for creativity.

In reality, scientists engage in many different discovery activities in many different sequences.

In reality, science depends on interactions within the scientific community. Different parts of the process of science may be carried out by different people at different times.

In reality, the process of science is exciting, dynamic, and unpredictable. Science relies on creative people thinking outside the box!

In reality, scientific conclusions are always revisable if warranted by the evidence. Scientific investigations are often ongoing, raising new questions even as old ones are answered.

