March 11, 2013, WTE Column. Editor's Headline: "Curriculum keeps Wyo. wild"

"Wild, Wonderful Wyoming" may get to be a little wilder soon, thanks to its inclusion in amendment to Senate File 55, the K-12 Energy and Natural Resources Education Initiative that recently became law. The amendment includes reference to Agriculture in the Classroom. Another amendment makes it voluntary for teachers' use.

Last month, when the House Education Committee debated SF 55, Bruce Hinchey of the Wyoming Petroleum Association lobbied for the measure, echoing Senator Coe's remarks when introducing SF 55 that students "need to know who pays the bills" in this state. Richard Garrett of the Wyoming Outdoor Council spoke as well, expressing concern that the measure would emphasize energy development without focusing on environmental safekeeping and Wyoming's need to conserve water.

That's when a member of the public pointed out that a curriculum such as SF 55 proposes already exists. "Wild, Wonderful Wyoming: Choices for the Future" (WWW) was begun some years ago by Professor of Science Education Duane Keown, now retired, through University of Wyoming's Science and Math Teaching Center and College of Education.

"The program had the participation of 44 of the 48 school districts across the state," said Dr. Keown in recent conversation. "Hundreds of schools got the curriculum. Some districts supported workshops for their teachers or sent superintendent-selected teachers to UW to build the program, or both."

He added that the teachers who helped develop the curriculum are "some of Wyoming's best. They came to us over four summers to assemble and create the program." Subsequently, interested teachers enrolled in the UWYO workshops, received the manuals, learned about the activities, and began implementing the program in their schools.

WWW was developed along guidelines of the National Science Education Standards. Inasmuch as our state does not mandate its teachers to acquire an understanding of Wyoming's natural resources, its environment and pertinent conservation, "Teachers often lack the background to carry out meaningful lessons on these subjects," observed Dr. Keown.

"Natural resource issues are 'the stuff of life' in Wyoming," notes his Foreword to the manual. "Energy fuels the ecosystems," he added in conversation. "For me, it's one of the most fascinating subjects to teach."

The manual consists of six well-developed sections: 1. Earth Systems; 2. Water Resources; 3. Energy, Minerals and Recycling Resources; 4. Wildlife Resources; 5. Forest Resources; 6. Agriculture Resources. Each section is preceded by a guide outlining grade-appropriate activities, time needed, subjects to integrate, and skill to be learned.

WWW gained the support of such diverse entities as Bureau of Land Management, Wyoming Game and Fish Department, U.S. Department of Education, Wyoming Department of Education, U.S. Bureau of Reclamation, Project Learning Tree, and Project WILD. Its initial Advisory Board included educators as well as commercial users, from UWYO faculty to a school-district Science and Math Supervisor, to the Wyoming Department of Agriculture, to the Petroleum Association of Wyoming, to the U.S. Forest Service.

Sue McGuire, who collaborated with Dr. Keown, is now president of a group that has renewed the partnerships with the university's Science and Math Teaching Center and College of Education, outlining an environmental education that can be integrated into school curricula to improve thinking skills, increase knowledge about science and technology (and other subjects such as economics, history, geography, and math), and engage students in their local communities.

"The goal is to have students environmentally literate by the time they graduate from high school," she says.

Ms. McGuire's group, Wyoming Association for Environmental Education, has been updating WWW with activities and resources that can be downloaded from its website, www.wyaee.org. Recent WYAEE efforts with UW include

- **Developed Focus groups** in 10 communities: Evanston, Jackson, Lander, Thermopolis, Cody, Gillette, Sheridan, Casper, Laramie, and Cheyenne. Discussed what is happening in schools and communities re learning about the environment/natural resources and what to improve. Attendees represented K-12 schools, state and federal natural resource management agencies, conservation groups, industry (oil/gas, agriculture, tourism), and community education (Draper Museum, Cheyenne Botanic Gardens, Casper Mountain and Teton Science Schools);
- **Shared information from the groups** at 2-day retreat of 28 representatives. Participants developed ideas for training teachers; current state education standards as basis for teaching; how to measure the environmental literacy of a high-school graduate;
- **Hired four teachers** who wrote sample curricula for early elementary, upper elementary, middle school, and high school: demonstrating how to integrate teaching about the environment and natural resources into current curriculum. This showed how to connect environmental literacy with education efforts: service learning (learning by doing, a community service project), STEM (Science, Technology, Engineering, and Math); 21st-century skills (critical thinking, communication, collaboration, creativity);
- **Currently compiling** the info into a draft plan to go out for comment, first to the participants of the focus groups and then to the public.
- **Writing the plan** to be implemented by interested schools and school districts with help of UW, nonprofits, community groups, and government

agencies.

The educational goals for students are to

1) **Understand the physical and biological world, and our relationship with it**
   a. The basic sciences of geology, biology, ecology, meteorology, etc.
   b. How human needs of food, energy, and shelter are addressed by the environment
   c. Interrelationships between people and the environment
2) **Understand and apply systems-thinking concepts and tools**
   a. How to use systems as a context for thinking and action
   b. Implications and consequences of making changes in a system
   c. How to use models and analyze assumptions
3) **Develop a sense of place at the regional, national, and global level**
   a. How history, culture, and economics are connected to the environment
   b. Characteristics of the local region and/or community
   c. The interconnections among regions and nations
4) **Investigate, plan, and create a sustainable future**
   a. How to ask questions and look for answers
   b. How to work with flexibility, creativity, and openness
   c. How to investigate and analyze problems and look for solutions
   d. How to reach conclusions and make decisions
5) **Understand and achieve personal and civic responsibility**
   a. Recognize citizens' rights and responsibilities of participation and leadership at local, national, and global levels
   b. Develop the self-confidence to be active citizens in their communities
   c. Understand the impacts of individual and group actions
   d. Understand personal and civic responsibility regarding shared resources

Our best to the curriculum's continued efforts and to all who worked hard to develop it. We wish you a successful teaching future and your students an abiding interest in our wild, wonderful state.