RECLAMATION
Managing Water in the West

Summer 2016

Plains Talk

NEWS FROM THE GREAT PLAINS REGION

Inside this Issue:

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Plains Talk encourages employee submissions, and assists with developing ideas. Questions about stories or photographic essays should be directed to the *Plains Talk* editor, at 406-247-7610.

Cover: Pathways Students tour Shoshone Power Plant.

contents

Hill Visits, p. 1

Garrison Diversion 50th, p. 12

Land Resource Training, p. 20

Using Color, p. 26

contents

2016 Hill Visits

Informing Congress of Reclamation Activities

Hill visits are a proactive effort on behalf of Reclamation's Congressional and Legislative Affairs and Reclamation's Regional Directors to foster open dialogue on water resource related issues with members of Congress. The visits also help develop a level of rapport and trust between Reclamation's leadership and Capitol Hill.

Visits generally span the better part of a week and are comprised of 15 to 20 meetings with various Senators, Representatives, and Committee Staff Members. Often, the member is present at the meeting, but sometimes they are not available and the meetings take place with congressional staff such as a Chief of Staff, Legislative Assistant, or Legislative Fellow.

Topics throughout the week generally cover all nine states in the vast Region and include the highest profile and sensitive issues. Congressional offices may prepare in advance of the Hill visits by reaching out to their constituents, or by reviewing past interactions with stakeholders in their respective states. Regional Directors have to be well versed in a wide range of issues and need to be prepared to discuss these issues in great depth and detail.

For the Great Plains Region, the annual Accomplishments Report is published as a handout to be used during the visits. Area Offices provide a list of short statements of fact for accomplishments of the past 18 months and their most important challenges for the coming year. The following pages represent this year's hill visits held in early June. Additional pages that are not included provide contact information, a Great Plains Region map, and a statement from Regional Director Mike Ryan.

Significant GP Milestones:

Windy Gap: The Windy Gap Firming Project is an exceptional example of the federal government working with our partners to get big things done. 2016 represents the first year of implementing a more collaborative approach to water operations.

Northwest Area Water Supply: Reclamation continues to work to resolve litigation affecting the project designed to deliver a bulk water supply to meet municipal and rural water needs of people in northwestern North Dakota. The project was authorized because existing water supplies are not of sufficient quality or quantity to reliably meet current needs or projected growth.

Wildfire fuel reduction: The Glacier Creek to Mill Creek Fuel Reduction in Colorado is a project of federal, state and local entities. Reclamation is providing $84,500 toward the partnership to reduce fuel loads and help prevent wildfires while improving watershed health on 210 acres in Rocky Mountain National Park in the headwaters of the Colorado-Big Thompson Project.

WaterSMART: Since 2009, Reclamation has provided more than $174 million in funding through WaterSMART Grants to states, Tribes and other partners. The grants are being leveraged with more than $426 million in non-federal funding to complete more than $600 million in improvements, which are expected to result in annual water savings of more than 570,000 acre-feet once completed, enough water for more than 2.2 million people. This year's Water and Energy Efficiency Grants are expected to be announced in June.

Fishermen below Yellowtail Diversion Dam at power plant location.

Crow Tribal Hydropower Development: The Claims Resolution Act of 2010 (Act) gives the Crow Tribe (Tribe) the exclusive right to develop hydropower at Yellowtail Afterbay Dam and authorizes $20,000,000 for energy development projects on the Reservation. Appraisal studies completed by the Tribe's consultant estimate the Yellowtail Afterbay Dam hydropower project will cost approximately $40,000,000. The Tribe and Reclamation executed an agreement to move forward with the project on March 26, 2015, and Reclamation will provide technical assistance to ensure safety and reliability with the existing Yellowtail Afterbay Dam.

Challenges in the Nine Great Plains States:

Republican River Compact: Reclamation will continue to work with Nebraska, Kansas and Colorado to comply with the Compact and make beneficial use of the water in the basin. Collaboration is needed to progress toward a long-term solution.

Rural Water Project Construction: Four projects in the Great Plains Region have significant balances of unfunded federal construction cost: Fort Peck/ Dry Prairie, Garrison Diversion, Lewis and Clark and Rocky Boys / North Central. These four projects have a federal appropriated construction cost of $1,480,329,000 through the end of the last fiscal year. $851,758,000 in federal expeniture remains to complete them.

Reclamation prioritizes rural water funding to meet two goals: complete high priority rural water projects that meet the most urgent water supply needs in a timely manner, and give priority to rural water projects addressing tribal water supply needs.

Operation, Maintenance and Rehabilitation of Reserved Works: Great Plains continues to build support with power customers for up-front funding of maintenance projects at power plants such as Mt. Elbert and Yellowtail. FY16 power customer funding is $29,573,000.

Ongoing Endangered Species Act Obligations: Continued support of the Platte River Recovery Implementation Program and the shared vision for creating and maintaining habitats on the Platte in Colorado, Wyoming, and Nebraska. Coordination with the Corps of Engineers, the Fish and Wildlife Service, the Solicitor's Office, and the Department of Justice in response to a lawsuit alleging violations of the ESA in operation of Fort Peck Dam and Reclamation's Intake Diversion Dam on the lower Yellowstone River in Montana.

Staffing issues: Workforce attrition due to retirements and competition with private sector wages (such as in Bakken area of North Dakota) impacts staffing of mission critical activities. Reclamation continues to increase our response to the Employee Viewpoint Survey results as a tool in improving employee engagement and retention.

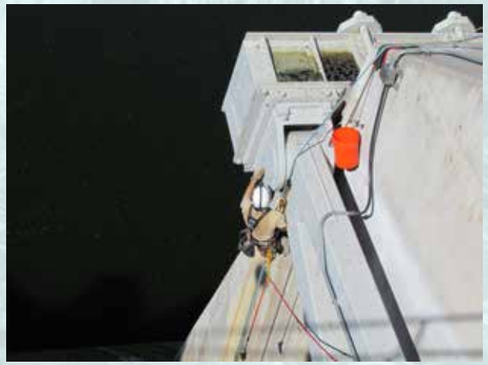
Dakotas Area

The **Northwest Area Water Supply** would deliver Missouri River water to communities in North Dakota. The Final Supplemental Environmental Impact Statement Record of Decision was signed on August 21, 2015. This culminated a multi-year effort after a 2010 District Court ruling. A motion for summary judgement is being coordinated with the Department of Justice and anticipated soon.

Continued **Rural Water Construction** in FY 2016, providing $24.8 million in North Dakota and $ 9.54 million in South Dakota to construct new water systems. Systems in North Dakota are serving 285,000 people and systems in South Dakota are serving 352,000 people.

In support of **President Obama's Youth Initiative** DKAO provided work experience opportunities at Shadehill, Dickinson, Keyhole, Belle Fourche, and Buford-Trenton projects performing fencing and maintenance.

Youth Conservation Corps fencing at Shadehill Reservoir.



Inspecting gate trunnion at Angostura Dam.

Work on Aging Infrastructure: Reclamation provided technical assistance and oversight to the Belle Fourche Irrigation District for the removal and replacement of the North and South Gate Control Houses including: all new mechanical equipment, electrical equipment, power service, and safety equipment.

Water was provided to irrigate 25,770 acres in ND and 87,800 acres in SD in 2015.

Eastern Colorado Area

Pueblo Dam releasing 6500 CFS during June 2015 runoff.

Fryingpan-Arkansas Project:

Reclamation completed a project scope, schedule, and cost estimates for rehabilitation of the **Mt. Elbert Power Plant**. This information was submitted to power customers with a request for additional up-front funding.

Southern Delivery System Phase I construction was completed on time, $160 million under budget by Colorado Springs Utilities and went into commercial production on April 28, delivering potable water from Pueblo Reservoir to Colorado Springs.

Feasibilty level engineering designs and updated cost estimates the **Arkansas Valley Conduit** will be completed in September 2016.

Colorado-Big Thompson Project:

Reclamation signed a memorandum of understanding (MOU) with Northern Colorado Water Conservancy District, Grand County Board of Commissioners, Colorado River Water Conservation District, and Northwest Colorado Council of Governments. The MOU establishes an adaptive management process to improve clarity in Grand Lake, while generating power and delivering water from the west slope to the east slope of the Rocky Mountains, to be implemented this summer.

Repairs to the **Dille Diversion** will be completed in time for spring runoff. This completes repairs to infrastructure damaged by the 2013 Big Thompson flood.

New antenna for Olympus Dam.

Montana Area

Implementation of the **Crow Tribe Water Rights Settlement** included Reclamation and the Tribe working cooperatively on early stages of designs and investigations for hydropower development at Yellowtail Afterbay Dam. A major milestone was reached with the signing of a water storage and allocation agreement on March 30th of this year.

Threatened and endangered species continue to be a concern with Bull Trout at the St. Mary Unit of the Milk River Project and Pallid Sturgeon on Lower Yellowstone Irrigation Project. The estimated cost to replace the St Mary diversion dam and provide fish screens is $40 million. For the Lower Yellowstone, a Draft EIS is being prepared jointly with the Corps of Engineers to evaluate passage alternatives at the Intake Diversion Dam.

Response to **climate change** is being explored through a National Drought Resiliency Demonstration Pilot Project in the Missouri River Headwaters Basin. This demonstration project responds to the President's March 21, 2016 Memorandum on Drought Resilience.

Rural water construction continues in FY 2016 with Fort Peck/Dry Prairie receiving $16.1 million and Rocky Boys/North Central receiving $13.1 million.

Reassembling Yellowtail Power Plant Unit 3.

Completed the rewind of Unit 3 at **Yellowtail Power Plant**, part of a $50 million project to upgrade Yellowtail generation.

An $8 million modernization project for the **Goose Bay Marina** at Canyon Ferry Reservoir was completed and a new concessions contract was awarded in April 2016 to Canyon Enterprises of Bozeman.

Nebraska-Kansas Area

In November 2015, the **Republican River Compact Administration** adopted a resolution, similar to the 2015 agreement, that extended the temporary approval of Nebraska's augmentation projects through 2016. The 2016 operations agreement reached by the States and Reclamation provide better certainty and more reliable water supplies for the surface water users in the basin.

Harlan County Dam.

19 Tainter gates at **Harlan County Dam**, constructed by the Army Corps of Engineers, are undergoing extraordinary maintenance work which is scheduled for completion in 2018 at an estimated cost of approximately $41 million. Bostwick Division irrigators are responsible for repayment of 15.37% or just under $6 million.

In March 2016, Reclamation released the **Republican River Basin Study**, which identifies adaptation strategies that address water management challenges in the basin. The study included an area of 2.7 million acres of irrigated agriculture served primarily by ground water supply and it represents an extensive collaborative effort among the states of Colorado, Kansas, and Nebraska.

A Health and Safety Report for the **Medicine Creek Concessionaire and Trailer Area** was completed in January 2016 identifying more than 1,165 non-compliance items in the areas of electrical, water, sewer and fire safety. Our managing partner, Nebraska Game and Parks Commission will be working with the Concessionaire and 54 trailer owners to come into compliance with local, state, and federal health and safety requirements.

A $600,000 contract to repair coatings on Glen Elder Dam spillway gates, hoisting equipment, and outlet works was completed in April 2016.

Oklahoma-Texas Area

Conservation storage at Reclamation's projects in Oklahoma has remained at or near 100% since June of 2015, except for Foss Reservoir which is at 80% of storage capacity. Conservation storage at Reclamation's three Texas Projects currently ranges from 9% at Twin Buttes Reservoir to 33% at Choke Canyon Reservoir.

Although much of the Oklahoma-Texas Area received an abundance of rainfall in recent months, planning activities for the next drought continue. Reclamation has been coordinating with several entities in Oklahoma and Texas on the completion of contingency plans and projects that improve drought resiliency.

Reclamation's **Basin Studies** Program is partnering with the Oklahoma Water Resources Board and local irrigation and municipal water districts in southwest Oklahoma on two basin-wide planning studies that assess long-term water supplies and demands, identify risks and vulnerabilities to supplies, and evaluate adaptation and mitigation strategies to improve long-term resiliency of Reclamation's reservoirs. Both studies are expected to be complete in 2018.

Reclamation will award a contract for dam safety modifications to the **W.C. Austin Project** (Altus-Lugert Reservoir) in September, 2016. The modifications will include raising the dikes which surround the Reservoir, backfilling open drain trenches, and installing toe drain systems below two of the dikes. The modifications are expected to require 20 months to complete, and will be funded in accordance with the Dam Safety Act which requires 85% Federal funding and 15% from non-Federal sponsors (Lugert-Altus Irrigation District and the City of Altus).

Reclamation and the Oklahoma Tourism and Recreation Department have continued to partner on Ameicans with Disabilities Act compliant improvements at Lake Thunderbird, McGee Creek Reservoir, and Fort Cobb Reservoir.

Accessible courtesy dock at McGee Creek Reservoir.

Wyoming Area

The **Glendo Safety of Dams** Project was substantially completed. Additions and alterations were designed to handle a new design flood of a 100,000 year return with flood peak inflow of 140,000 cfs.

Buffalo Bill.

Power customer funded maintenance was completed at three power plants. Buffalo Bill's tailrace and draft tube concrete was repaired, Glendo's fixed wheel gate was refurbished to extend working life and prevent the loss of water supply for power generation, and Fremont Canyon's water service piping was replaced to assure cooling water to the generators and for fire protection.

Glendo.

Fremont Canyon.

Current statistics: 3.1 million acre-feet of reservoir releases were made in FY 15 provided irrigation to 648,000 acres of land in Wyoming and Nebraska. Eleven hydropower plants produced a net generation of nearly 764,000 megawatt-hours, enough to supply the electricity to 70,000 households for one year. An estimated one million recreation visitors enjoyed WYAO reservoirs and lands in FY15 adding approximately $1.6 million in revenue to local economies.

While Wyoming continues to be the least populated state in the union, the population is growing steadily. This is expected to lead to more demand for resources, such as water, power, and use of federal land, which may lead to increased demands on Reclamation facilities.

Great Plains Region Facts

The Great Plains Region is vast. It includes 856,000 square miles - more than half the area Reclamation serves. It covers most of nine states and encompasses a wide range of ecosystems from alpine tundra to the gulf coast. Facilities in the region face challenges unique to their location and demands on their operation. Because of geographical diversity, the region is typically impacted by drought and flooding at the same time.

Veliger (invasive mussel) sampling at Tiber Reservoir, Montana.

Many of the first projects built by Reclamation are in what is now the Great Plains Region. These early projects are often called "single purpose" because their primary function was to store water for irrigation. Flood control, hydropower, recreation, fish and wildlife enhancement and municipal water evolved as the West was settled and demands on water supplies grew.

Cunningham Tunnel inspection in Colorado.

In the Great Plains Region there are 80 Reclamation reservoirs with a total capacity of 22.9 million acre-feet of water. Reclamation's assets, including canals, power and pumping facilities, dams and support buildings, have a current value of about $20 billion.

Great Plains Region:

- **Irrigates more than 2 million acres.**
- **Has avoided over $4.4 billion in flood damages.**
- **Generates power for more than 173,000 homes.**
- **Provides drinking water to more than 3 million people.**
- **Has 18 recreation areas and 14 million visitors annually.**
- **Provides fish and wildlife habitat in nine states.**

Great Plains Region PATHWAYS

Reclamation Pathways Students at the entrance to the Department of the Interior building, Billings, Mont.

By HR Staff, RO

We pay, you learn, the early slogan for the Great Plains Region's Student Employment Program, has elicited the interest of hungry college students for years.

The student program has undergone some changes over the years, but remains committed to recruiting and hiring degree-seeking students interested in careers with water and related resources.

The Pathways Internship Program offers many opportunities and benefits to students, such as hands-on work experience, tuition assistance and potential permanent placement upon graduation.

The Pathways Internship Program offers many opportunities & benefits to students, such as classes, hands-on experience & tuition assistance.

The summer rotational internship program, sponsored by the Regional Leadership Board (RLB), allows students from around the country to travel to Great Plains Region sites for a minimum of two summers to participate in a wide variety of projects at different facilities and offices. Students may receive a living stipend, an hourly salary and are stationed at a different office each summer until completion of their degree.

Each winter, the rotational internship program is reinvigorated in preparation for the summer's anticipated student hires. Human Resources requests intern needs from Area and Regional offices in December or January and posts positions early in the year.

For summer 2016, the Region hired 22 new students in the fields of Engineering, Natural Resources and Safety and Occupational Health. Nine current Pathways students returned for the summer for a total of 31 student interns in the Region's Pathways rotational program.

Outreach efforts for the Pathways Program engaged HR staff, Administrative staff and subject-matter-experts (SMEs). Regional staff attended events at more than 34 colleges and hiring events around the country from Montana to Texas, and from Washington, D.C. to New Jersey. The extensive recruitment efforts produced more than 600 applications for the five vacancy announcements posted; more than triple the number of applications received last year. That outreach paid off as 68 percent of new student hires are from colleges attended or targeted through the focused outreach.

The presence of Administrative, HR staff, and SMEs at career fairs is extremely valuable and was evident this year.

In addition to the RLB sponsored summer rotational program, offices also have the option to hire their own interns if there is a school local to the duty station or strictly during summer months. Nebraska-Kansas Area Office (NKAO) hired a Civil Engineering student trainee who will be starting summer of 2016.

Jeff Zentz, Administrative Officer at NKAO, attended career fairs to recruit for both the rotational intern program as well as an Engineering trainee for his own area office. Zentz said, "I loved attending the career fairs and representing Reclamation. I enjoyed talking to the students and explaining our Pathways Program as an opportunity to try us out each summer and then potentially begin a career with us when they graduate."

As part of their familiarization with the Great Plains Region, Pathways students visited the Heart Mountain Relocation Center, located in Park County, Wyoming, between Cody and Powell.

Anna Hoag, a Civil Engineer at Oklahoma-Texas Area Office and former Region SCEP student, attended a career fair as a SME. "As an alumni of Oklahoma State University and former intern, it was great to act as a SME and visit with the students in Engineering fields and to get the word out about the Bureau of Reclamation and the work we do," said Hoag.

Tom Sawatzke, Deputy Area Manager at the Montana Area Office, spoke to a number of students at Montana Tech. "We were impressed by the professionalism of the students and their interest in working with us," Sawatzke said.

HR anticipates coordinating similar outreach efforts next year to reach even more students and encourages Regional staff to participate in outreach efforts. A number of the employees throughout the Region have been introduced to Reclamation and hired through these internship opportunities. Since 1998, over 145 hires have been made through the program and that number continues to grow.

Great Plains Region
Pathways Internship Program Participants
2016

The Pathways Program is designed to provide recent graduates and students enrolled in a wide variety of educational institutions, from high school to graduate level, opportunities to work in agencies and explore Federal careers while still in school and while getting paid for the work performed. Students who successfully complete the program may be eligible for conversion to a permanent job in civil service.

Alex Adams
Wright State University
Biological Sciences
May 2018
Student Trainee
(Natural Resources)
DKAO/Bismarck, ND

Corey Snider
Tufts University
Civil Engineering/
Architectural Studies
May 2018
Student Trainee
(Civil Engineering)
Regional Office/Billings, MT

Kaylen Cheesman
University of
Southern Indiana
Mechanical Engineering
May 2018
Student Trainee
(Mechanical Engineering)
WYAO/Mills, WY

Lillian Wavering
Colorado School of Mines
Geological Engineering
May 2018
Student Trainee
(Civil Engineering)
MTAO/Billings, MT

Peter Meckling
South Dakota School
of Mines and Technology
Civil Engineering
December 2017
Student Trainee
(Civil Engineering)
DKAO/Bismarck, ND

Tali Whittemore
George Mason University
Electrical Engineering
May 2018
Student Trainee
(Electrical Engineering)
MTAO/Billings, MT

Angela Rivera
University of Texas
at San Antonio
Civil Engineering
May 2017
Student Trainee
(Civil Engineering)
ECAO/Flatiron, CO

Daniel Craig
University of Idaho
Electrical Engineering
May 2017
Student Trainee
(Electrical Engineering)
WYAO/Mills, WY

Kevin Bergman
South Dakota School of
Mines and Technology
Geological Engineering
May 2019
Student Trainee
(Natural Resources)
MTAO/Canyon Ferry, MT

Marisela Castro
University of Texas at Austin
Civil Engineering
May 2018
Student Trainee
(Civil Engineering)
Regional Office/Billings, MT

Robert Brennan
Rutgers University
Plant Science
May 2018
Student Trainee
(Natural Resources)
Regional Office/Billings, MT

Thereasa Kapust
Black Hills State University
Biology
December 2016
Student Trainee
(Natural Resources)
NKAO/McCook, NE

Christopher Howell
North Dakota State University
Mechanical Engineering
December 2017
Student Trainee
(Mechanical Engineering)
ECAO/Flatiron, CO

Daniel Warner
University of Maryland
Mechanical Engineering
December 2017
Student Trainee
(Civil Engineering)
NKAO/McCook, NE

Kevin Foley
University of Michigan
Civil Engineering
May 2017
Student Trainee
(Civil Engineering)
DKAO/Pierre, SD

Michael Gutierrez
Texas A&M University
Electrical Engineering
December 2018
Student Trainee
(Electrical Engineering)
WYAO/Mills, WY

Sam Gulliford
Oregon Institute of Tech
Electrical Engineering
June 2018
Student Trainee
(Electrical Engineering)
WYAO/Mills, WY

Tyler Myers
Colorado State University
Electrical Engineering
May 2017
Student Trainee
(Electrical Engineering)
ECAO/Flatiron, CO

Christopher Kinsey
Montana Tech
General Engineering
May 2018
Student Trainee
(Mechanical Engineering)
MTAO/Billings, MT

Frederic Apiou
Savannah State University
Civil Engineering
December 2016
Student Trainee
(Civil Engineering)
Regional Office/Billings, MT

Laura Kofahl
University of Texas at Austin
Civil Engineering
December 2017
Student Trainee
(Civil Engineering)
OTAO/Austin, TX

Michelle de Leon
Cornell University
Environmental and
Sustainability Sciences
May 2018
Student Trainee
(Natural Resources)
OTAO/Oklahoma City, OK

Sedona Rockwood
University of Wyoming
Chemical Engineering
December 2018
Student Trainee
(Safety & Occupational
Health Management)
WYAO/Mills, WY

Tyler Stremcha
Montana Tech
Civil Engineering
May 2018
Student Trainee
(Civil Engineering)
DKAO/Rapid City, SD

Colin Zilverberg
South Dakota School of
Mines and Technology
Geological Engineering
December 2017
Student Trainee
(Natural Resources)
DKAO/Rapid City, SD

Jacob Hoffman
Montana State University
Land Rehabilitation
December 2017
Student Trainee
(Natural Resources)
WYAO/Mills, WY

Lauren Allin
University of Wisconsin
Geological Engineering
May 2018
Student Trainee
(Civil Engineering)
DKAO/Bismarck, ND

Morgan Clapshaw
Montana State University
Civil Engineering
May 2017
Student Trainee
(Civil Engineering)
WYAO/Mills, WY

Swedi Bitendelo
Kansas State University
Civil Engineering
May 2018
Student Trainee
(Civil Engineering)
WYAO/Mills, WY

Wesley Burkert
University of Nebraska
Civil Engineering
May 2019
Student Trainee
(Civil Engineering)
NKAO/McCook, NE

Corbyn Coffelt
Kansas State University
Civil Engineering
December 2018
Student Trainee
(Civil Engineering)
DKAO/Pierre, SD

Nicholas Frassenei
University of Massachusetts
Mechanical Engineering
May 2018
Student Trainee
(Mechanical Engineering)
WYAO/Mills, WY

Original poster art by
Miesha Arnold, GPRO

NKAO Launches SCADA State-of-the-Art System

New Supervisory Control and Data Acquisition (SCADA) system for Nebraska-Kansas Area Office.

The Nebraska-Kansas Area Office (NKAO) located in McCook, Nebraska, is in the process of replacing its Supervisory Control and Data Acquisition (SCADA) system.

The new system will incorporate state-of-the-art Programmable Logic Controller (PLC) driven Remote Terminal Units (RTUs) at the dams and a Windows Server 2012 based Master Station computer system at the Main Office.

The SCADA system uses a telephone-based multi-protocol label switching wide-area network to collect data and provide control of dam features.

Scipar, Inc. out of Buffalo, New York, is the lead contractor for the new system. Installation of the RTUs began in late April utilizing a local contractor.

NKAO provides maintenance, operational jurisdiction and control for 16 dams and reservoirs located in Nebraska, Kansas and Colorado.

These reservoirs, together with nine diversion dams, nine pumping plants, and 20 canal systems, serve approximately 269,745 acres of project lands in Nebraska and Kansas.

In addition to irrigation and municipal water, these features serve flood control, recreation, and fish and wildlife purposes.

NKAO has direct control of eleven dams in Colorado, Kansas, and Nebraska, within the Kansas River Basin.

To ensure more efficient use of available personnel and to ensure timely delivery of irrigation water, the project installed a Programmable Master-Station Control (PMSC) system in the late 1970s.

This original system was replaced with a state-of-the-art Supervisory Control and Data Acquisition (SCADA) system in 1993. This system was upgraded in 2008 with the Master Station and Man Machine Interface computers being replaced with newer models.

Many of the discrete RTU parts from this system are still in use and have reached the end of their useful life, with replacement parts difficult to find or obsolete, and new parts difficult to integrate.

Some of the SCADA equipment being replaced is over 20 years of age, well beyond the normal life expectancy of 10 years.

The SCADA system collects data and allows gate movements to be accomplished by a system controller at the headquarters in McCook for the following dams:

- **Bonny Dam near Burlington, Colo.;**
- **Trenton Dam near Trenton, Neb.;**
- **Enders Dam near Enders, Neb.;**
- **Red Willow Dam near McCook, Neb.;**
- **Medicine Cr. Dam near Cambridge, Neb.;**
- **Norton Dam near Norton, Kan.;**
- **Lovewell Dam near Webber, Kan.;**
- **Webster Dam near Stockton, Kan.;**
- **Kirwin Dam near Kirwin, Kan.;**
- **Glen Elder Dam near Glen Elder, Kan.;**
- **Cedar Bluff Dam near Hays Kan.**

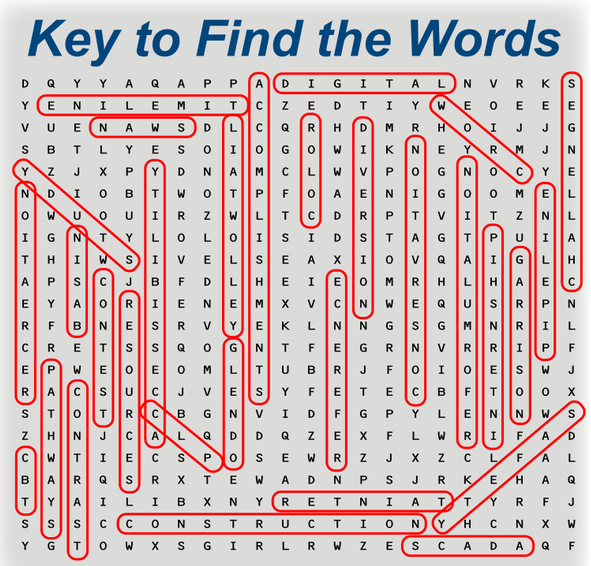
Water releases can be scheduled to arrive at the diversion points at the time it is required, rather than being dependent upon regular working hours.

The availability of a dependable control system also frees up the 10 Reclamation facilities superintendents to accomplish other duties since they will not be required to remain at remote locations to release water upon demand.

The SCADA system also allows for closer management of the water supplies and provides for better site security.

Final installation and testing of the new system is scheduled to be completed this summer with the system fully operational by August 2016.

Key to Find the Words



Garrison Diversion Celebrates 50 Years

By Patience Hurley, DKAO

On January 6, 1966, the Garrison Diversion Unit master contract was signed between the United States and North Dakota's Garrison Diversion Conservancy District.

The signing of this contract was, at the time, considered the best way for North Dakota to create municipal, rural, and industrial water supplies, fish and wildlife habitat, recreation benefits and to bring farmers much needed water from a fully developed irrigation system. Although that vision has not been fully realized, North Dakota has seen a wealth of benefits from the project.

(Above) Lowhead dam located within the Lonetree Wildlife Management Area in central North Dakota comprises 33,000 acres owned by Reclamation.

The project first got its roots as one of the principal pieces of the Pick-Sloan Missouri River Basin Program and was initially contracted as the Missouri-Souris Unit.

First authorized by the Flood Control Act of 1944, the plan was to construct a series of dams on the Missouri River to control flooding, provide power generation, water for irrigation, cities, industry, wildlife and recreation.

Then came the construction of the Garrison Dam, completed in 1953, followed by a number of studies that created substantial changes in the location and acreage of land to be irrigated under the then named Missouri-Souris Unit. With these changes, Congress reauthorized and renamed the project the Garrison Diversion Unit in 1965.

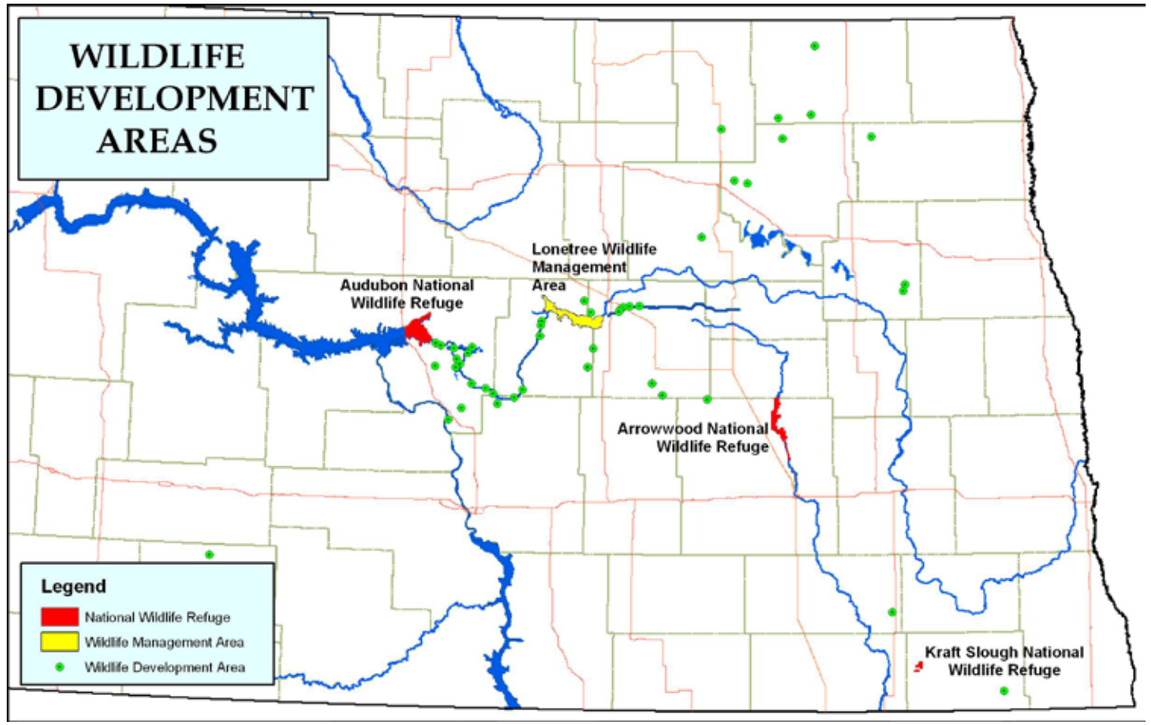
Center Pivot Irrigation System utilized within the Garrison Diversion Unit.

Initial studies of the Garrison Diversion Unit proposed the development of more than 1-million acres of land for irrigation utilizing more than 6,773 miles of canals, construction of the Snake Creek Pumping Plant to transfer water from the Missouri River to the Souris, James, and Sheyenne Rivers and the Devils Lake Basin, and several reservoirs throughout the system. The plan also anticipated water service to 14 cities and provided for a 146,530 acre wildlife plan to mitigate wildlife habitat losses. Ultimately, with soil studies showing much of the proposed soils unfit for irrigation, the reauthorized Unit set its sights on 250-thousand irrigable acres of land.

With all the planned components of the projects outlined, the price tag continued to increase and the timeframe for construction stretched out 60 years. Construction on many of the major components of the plan, to include the McClusky and New Rockford Canals and the Snake Creek Pumping Plant carried on into the mid-1980s, when new environmental and economic concerns arose.

The plan was once again revised with the Garrison Diversion Unit Reformulation Act of 1986. This Act required a comprehensive study of environmental impacts,

Water pipeline for the Northwest Area Water Supply System.



Oakes Test Area.

deauthorized many components, realigned irrigable acres, and set aside money for investigation and construction of a water supply system throughout the State, but specifically to Fargo and Grand Forks, North Dakota.

The Act also included as a high priority drinking water and industrial use, environmental protections, and recreation. The 1986 Act allowed construction to continue on some of the water supply systems, and activities began on mitigation and wildlife habitat, and municipal, rural and industrial projects.

Then came another amendment of the plan in the form of The Dakota Water Resources Act of 2000. This Act passed the Congress on December 15, 2000, and included a program to meet Indian and non-Indian water supply needs in North Dakota. Another key component of this Act was

Example of buried pipeline avoiding wetland impacts.

to preserve any existing rights of North Dakota to use water from the Missouri River.

GARRISON DIVERSION TIMELINE:

December 22, 1944 - Pick-Sloan Flood Control Act was authorized in the Flood Control Act of 1944.

January 27-28, 1959 - Senate Bill (SB154) passed. The bill would amend the powers and duties of Garrison Diversion Conservancy District directors giving them the authority to become the operating organization for the Garrison Diversion Unit.

April 5, 1962 – In his conservation message to Congress, President Kennedy specifically mentioned Garrison Diversion Unit as a project that should be authorized by Congress this session.

August 5, 1965 - President Lyndon B. Johnson signed a bill authorizing Garrison Diversion Unit.

January 26, 1966 – Master Contract between the United States and the Garrison Diversion Conservancy District is signed.

July 14, 1968 - Groundbreaking of Snake Creek Pumping Plant.

May 10, 1970 – Groundbreaking ceremony held for the McClusky Canal.

October 12, 1978 - Contract awarded for earthwork and structures for a fish screen testing facility on a turnout from the McClusky Canal.

July 5-6, 1984 - Construction on the Lonetree Dam and James River Dike is 40 percent complete.

April 3-4, 1986 - Burdick-Miller Bill - National interest declaration for irrigation had been deleted and a $12 million Wetlands Trust was created. It deleted portions of the 1944 and 1965 Acts. It also authorizes $200 million for MR&I.

October 10-11, 1991 - Bureau of Reclamation reported New Rockford Canal is 99 percent complete. Garrison Diversion Conservancy District has officially taken over Operation and Maintenance of the McClusky Canal and New Rockford Canal.

October 7, 1993 - Dedication - Lonetree Wildlife Management Area.

July 1-2, 1997 - Lonetree Wildlife Management Area was officially transferred to the ND Game and Fish Department on January 1, 1997.

December 15, 2000 – Dakota Water Resources Act Bill passed.

GP Block Safety Training

By Gary Barsness, Regional Safety Officer, GPRO

Keeping with this idea of whole and healthy employees, the Great Plains Regional Office held the annual block safety training during the week of January 25, 2016. This year two specialized courses were offered along with the annual safety training topics. The training topics offered were: Rigging, Hoisting and Signal Person Certification; OSHA 10-hour Course; Hazard Communication and the Global Harmonized System; Respiratory and Hearing Protection; Hazardous Energy Control Program (HECP); Active Shooter Awareness; and First Aid, CPR and AED.

The rigging, hoisting and signal person training was provided to the drilling crews to refresh their knowledge of safe work practices and provided each of them signal person certification.

The OSHA 10-Hour Construction Outreach Training covered a variety of construction safety and health hazards at construction sites. Training emphasized hazard identification, avoidance, control and prevention, not OSHA standards. Topics included falls, electrocution, struck-by (e.g., falling objects, trucks, cranes), caught-in or between (e.g., trench hazards, equipment), personal protective equipment (PPE), scaffold, and materials handling, storage, use and disposal.

Safety is paramount. We want our employees to be healthy and whole at the end of the day.

- Commissioner Estevan López

The Hazard Communication Training reviewed OSHA's revised regulations for chemical labeling and safety information, which now align with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS). In order to ensure chemical safety in the workplace, information must be available to employees about the identities and hazards of the chemicals they use. The Hazard Communication Standard adopted the GHS approach to classifying chemicals and communicating hazard information on labels and safety data sheets.

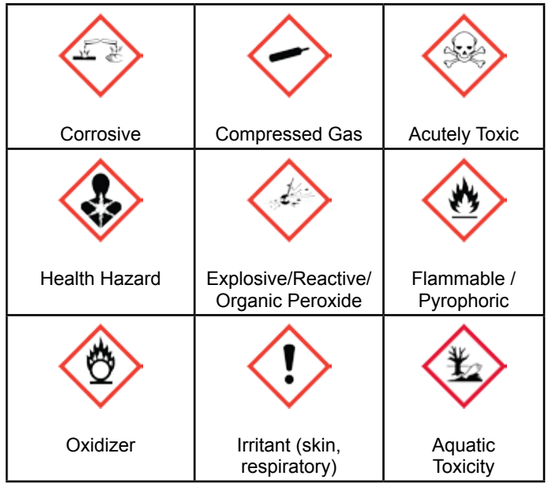
Chemical manufacturers and importers are required to evaluate the hazards of the chemicals they produce or import, and prepare labels and safety data sheets to convey the hazard information to their customers. OSHA provides specific criteria for classification of health and physical hazards, as well as classification of mixtures. All employers with hazardous chemicals in their workplaces must have labels and safety data sheets for their exposed employees, and train them to handle the chemicals appropriately.

For existing chemicals on site, facilities must ensure that chemical containers within their facility have updated labels with specific product identifier and words, pictures, symbols, or combination thereof, which provide specific information regarding the physical and health hazards of the chemical. It is important that the updated health and physical hazards are communicated on the label. If a facility can get an updated manufacturer's label, that is the best option. If a facility is unable to get an updated manufacturer's label with the above information, the chemical must be labeled using the facility specific chemical labeling system. Once again, it is important that the updated health and physical hazards are communicated on the label.

Employees attack the "active shooter" with improvised weapons in this mock battle during Brian Cornell's Active Shooter Awareness training.

GHS pictograms are graphic symbols used to communicate specific information about the hazards of a chemical. The required pictograms consist of a red square frame set at a point with a black hazard symbol on a white background, sufficiently wide to be clearly visible. Each pictogram represents a distinct hazard category. The categories are shown in the Hazard Communication Pictograms on the next page.

As of June 1, 2015, new Safety Data Sheets must follow the specified 16-section uniform format under the headings listed on the next page.



Hazard Communication Pictograms. Source: OSHA.gov

SAFETY DATA SHEET HEADINGS

Section 1, Identification includes product identifier; manufacturer or distributor name, address, phone number; emergency phone number; recommended use; restrictions on use.
Section 2, Hazard(s) identification includes all hazards regarding the chemical; required label elements.
Section 3, Composition/information on ingredients includes information on chemical ingredients; trade secret claims.
Section 4, First-aid measures includes important symptoms/ effects, acute, delayed; required treatment.
Section 5, Fire-fighting measures lists extinguishing techniques, equipment; chemical hazards from fire.
Section 6, Accidental release measures lists emergency procedures; protective equipment; proper methods of containment and cleanup.
Section 7, Handling and storage lists precautions for safe handling and storage, including incompatibilities.
Section 8, Exposure controls/personal protection lists OSHA's Permissible Exposure Limits; ACGIH Threshold Limit Values; and any other exposure limit used or recommended by the chemical manufacturer, importer, or employer preparing the SDS where available as well as appropriate engineering controls; PPE.
Section 9, Physical and chemical properties lists the chemical's characteristics.
Section 10, Stability and reactivity lists chemical stability and possibility of hazardous reactions.
Section 11, Toxicological information includes routes of exposure; related symptoms, acute and chronic effects; numerical measures of toxicity.
Section 12, Ecological information
Section 13, Disposal considerations
Section 14, Transport information
Section 15, Regulatory information
Section 16, Other information, includes the date of preparation or last revision.

The respiratory and hearing protection courses were offered for those employees who are required to wear respirators and hearing protection. Exposure controls were discussed including engineering controls and PPE. The hearing and respiratory testing protocols were reviewed briefly.

As in past years, the Reclamation Hazardous Energy Control Program (HECP) was taught by the Denver Power Resources Office. This course is necessary for all who must attach a lock to an energy clearance or those that participate in lockout/tagout procedures. The course provided requirements for de-energizing and securing equipment prior to performing maintenance. A basic electrical safety course was also offered as part of the HECP training.

Brian Cornell taught the Active Shooter Awareness course. He reviewed the ALICE (Alert, Lockdown, Inform, Counter, Evacuate) set of proactive, options-based strategies, that increase chances of survival during a violent intruder or Active Shooter event. This training was designed to teach employees skills and strategies that bridge the gap between the time a violent event begins and when law enforcement arrives.

The final training course offered was the first aid, CPR and AED certification class. Billings Clinic taught the American Heart Association Heartsaver program to a full house. Objectives of the course include learning proper techniques to administer life-saving first aid in emergency situations, as well as: assessing the patient, cardiac emergencies, basic life support, including airway management, breathing, and circulation, and using an Automated External Defibrillator (AED).

We want to thank all the employees for their interaction within the courses and their supervisors who made time available to attend the block training.

Reclamation employees take part in a 6-hour Standard First Aid/Adult CPR/AED class provided by staff from Billings Clinic.

WYAO Benefits from Interns PATHWAYS

By Jay Dallman, WYAO

The Pathways Internship Program, formerly Student Career Experience Program (SCEP) and Student Temporary Employment Program (STEP), is a summer rotational internship program.

The program actively recruits college students from around the country, providing an opportunity to earn income in a summer position with a Reclamation office while gaining experience related to their field of study.

In the Great Plains Region, the Pathways Program is sponsored by the Regional Leadership Board (RLB). Students are stationed at a different office in our Region each summer until completion of their degree.

WYAO hosted nine Pathways student employees during summer 2016.

Wayne Parker, Chief of the Electrical Engineering Branch, supervised three of the new interns who are studying to be electrical engineers.

Daniel Craig plans to graduate in May 2017. He began his internship program at Flatiron Power Plant for ECAO last summer.

Sam Gulliford, a student at Oregon Institute of Technology, and Michael Gutierrez of Texas A&M, started their internships this summer at WYAO.

Wayne is very enthusiastic about his new interns. "The pool of electrical engineers that understand power generation is very small. The few colleges and universities that have a power program tend to teach their students only about transmission and distribution. The Pathways Program provides a mechanism to develop electrical engineers that understand power generation and are familiar with Reclamation operations."

Dan, Sam and Michael worked on generator lockout systems for Kortes, Fremont and Guernsey Power Plants.

Brock Owen, Chief of the Mechanical Engineering Branch, supervised Kaylen Cheesman (University of Southern Indiana) and Nicholas Frassenei (University of Massachusetts), both first year interns. Kaylen will be helped with maintenance of plant equipment at Seminoe, Kortes and Alcova Power Plants. Nicholas will be assisted with plant equipment maintenance at Fremont and Alcova Power Plants.

WYAO Interns from left to right: Morgan Clapshaw, Kaylen Cheesman, Daniel Craig, Sam Gulliford, Swedi Bitendelo, Jacob Hoffman, and Nicolas Frassenei. Not shown are Sedona Rockwood and Michael Gutierrez.

Swedi Bitendelo, a Civil Engineering major from Kansas State University is in his first year of the program. He worked for Claudia Hill in our Facilities Management Division. Swedi developed specifications for parking lot and access road resurfacing at Boysen and Alcova Power Plants. He also assisted with projects in the Technical Analysis Branch. On top of that, he is enrolled in ROTC at Kansas State and is serving in the U.S. Army Reserves.

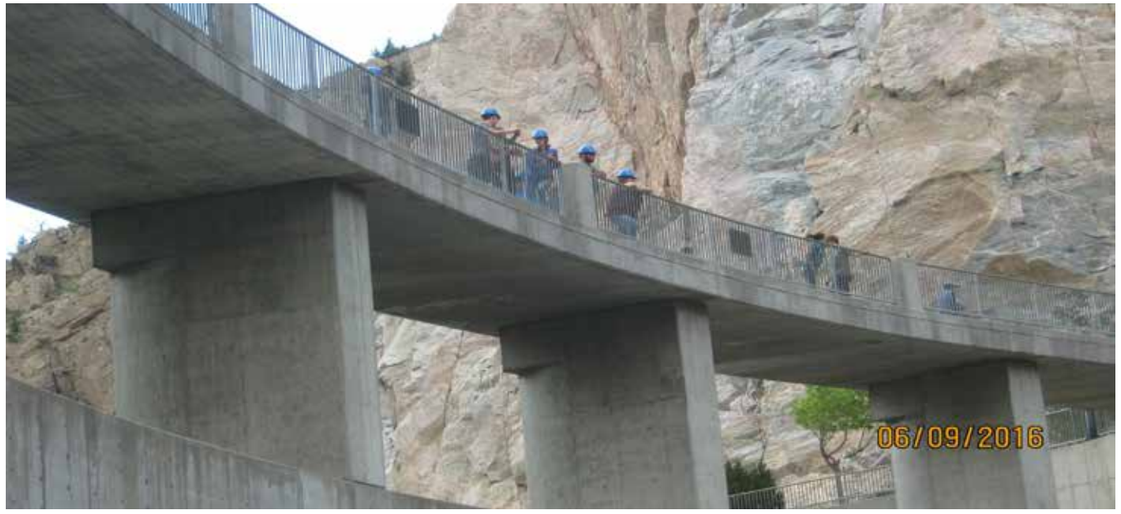
Jacob Hoffman, a senior majoring in Natural Resources at Montana State University, worked for George Neuberger as a Natural Resource Specialist in the Land Branch this summer. He was busy collecting field data and developing a GIS data base which will be used to manage recreation related signs and public recreation structures and facilities.

Morgan Clapshaw is working on her Civil Engineering degree at Montana State University. Last year she served her internship at DKAO in Bismark. This year she assisted WYAO with daily water operations in the Water Management Branch under Art Hill. Her duties included making stream flow measurements, and updating stream gauge safety manuals. In addition, she assisted the Technical Analysis Branch.

Mike Bradford, the Safety Manager at WYAO, had the assistance of Sedona Rockwood. She is a junior at University of Wyoming majoring in Chemical Engineering. Sedona conducted an assessment of the Hazardous Communication Program (HAZCOM) at WYAO, updating Safety Data Sheets, and ensuring proper hazardous materials storage requirements are being observed.

In addition, one of the Pathways Program graduates started their federal career with a full time engineering position in the Technical Analysis Branch of the Facilities Management Division at WYAO. Nathan Morgan, a graduate of the Civil Engineering Program at Saint Martin's University in Lacey, Washington served as a Pathways intern in DKAO in 2014 and WYAO in 2015. "My Pathways internship exposed me to a great amount of engineering mixed with hands on experience and it provided me with a good job upon graduation."

The new crop of interns kept busy assisting with a variety of tasks related to their specialty fields. The interns were paid while they honed their skills and broadened their work experience. And, in some cases, the internships have become a springboard to permanent positions in Reclamation.



Wyoming interns during the Pathways tour at Buffalo Bill Dam.

Hosted by the Oklahoma-Texas Area Office April 19 - 21, 2016.

By Kimberly Parish, OTAO

The Oklahoma-Texas Area Office had the pleasure of hosting the 2016 Great Plains Land Resources Training in Norman, Oklahoma, April 19 - 21, 2016.

Staff and managers representing all six area offices, Denver policy, and the regional office, participated in the training.

Training focused on a number of recent policy changes, emerging trends and current challenges, as well as more practical 'how-to' sessions on conducting program reviews and implementing consistent program directives.

The training also provided a forum for specialists to collaborate and share best practices and approaches to day-to-day concerns.

The group had excellent insights and the open dialogue generated a great deal of energy and new ideas to approach similar challenges.

The first day of training included a session led by Denver Policy Staff (Ryan Alcorn and Jerome Jackson), focusing on new and emerging issues, minor revisions to directives and standards, and funding opportunities through the Federal Lands Transportation Program (FLTP).

In addition, the day included training sessions on Accessibility and Civil Rights complaint process, Youth Conservation Corps Work and Funding Programs, authorized and unauthorized uses, recreation/concession inspections, and GSA Targeted Asset Reviews.

While addressing all of these topics, participants had the opportunity to express their ideas, concerns and similar issues they may be experiencing or have experienced. This exchange allowed for feedback from other offices and how they have resolved similar issues.

The second day of training, participants took a field trip to OTAO's Norman Project at Thunderbird State Park.

The field day included five site visits, each site designed to address a variety of land management issues, ranging in complexity and scope of program issues. Site One focused on the new Hog Creek Day Use Area and Little River Marina.

Presentations were provided by OTAO to the participants addressing Accessibility, Concession Reviews/Inspections, and Managing Partner Agreements.

The group had the opportunity to walk around the area and ask questions regarding the site planning, coordination with the partners, etc.

Site Two involved a visit to the Plains Pipeline relocation site (right-of-way) where OTAO described the process in working with the project proponent in an effort to minimize disturbance impacts to the project and habitat.

This area is also utilized as one of several designated access points and parking areas for hunting, a program sponsored through the state and supported through collaborative efforts.

The group then traveled to Site Three (Turkey Pass and Calypso Cove) and Site Four (South Dam Day Use Area) to learn about cost-sharing opportunities and Title 28, and the importance of coordinated recreation planning and engineering design to accommodate the diversity of visitor experiences/ opportunities.

The group heard from OTAO staff on how working with local partners is integral to ensuring a safe and inviting recreational area allowing a high-quality recreation experience.

The team discussed how planning, coordination and communication, and site inspections are key factors to determining successful outcomes to our recreation areas and partner management. The last site visit of the day was Little Axe Day Use and Campground.

Fire Management Plans, site design, and issue exchange were all discussed.

The end of the day concluded with a time for participants to ask any questions they had from any earlier discussions, explore details about project management and implementation, and follow-up on the great ideas learned throughout the days' site visits.

Training topics on the last day included Resource Management Planning, Managing Partner coordination, and private exclusive use.

The training provided valuable insight to participants, encouraging networking and allowed for opportunity to share the challenges the area offices and regional office experience and explore the tools and path forward to provide the optimal experience on Reclamation lands.

Reclamation serves a very diverse group of people looking to use the same resources in very different ways. Coordination and collaboration is key to the success of our agency and our ability to meet the needs of the public.

Participants in Great Plains Land Resources Training gathered in Norman, Oklahoma to share skills and training.

Great Plains 2015 Photo Contest

The 2015 GP Photo Contest produced 78 photo entries showing the diverse activities, facilities, people, and wildlife in the Great Plains Region. Nearly 160 votes were cast for more than 40 assorted photos, but top honors go to three photographers and their great images.

Charles Young, C&I Mechanic (ECAO), wins first place with his photo "Of course that is Green Mountain Power Plant at the end of the Rainbow!" Adam Northrup, Civil Engineering Technician (ECAO), earns second place with his photo looking over the edge of the Sun River Diversion Dam, during a rope access inspection. Ray Farrar, Plant Mechanic (WYAO), takes third place with his photo of Baby owls at Glendo.

Keep an eye out for all photo contest images in a variety of Reclamation publications, including the 2015 GP Region Calendar, Plains Talk Magazine, presentations and in our multimedia gallery on the Internet at www.usbr.gov/gp/multimedia.

Thank you photographers for the great images! And thank you everyone who took the time to view the photos and vote for their favorite.

First Place Winner

Of course that is Green Mountain Power Plant at the end of the Rainbow! Photo by Charles Young (ECAO).

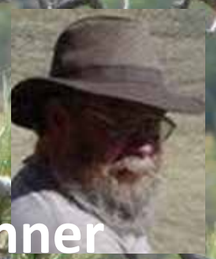
Second Place Winner

Sitting on the edge of Sun River Diversion Dam, looking down at the river below, during a rope access inspection of the structure. Photo by Adam Northrup (ECAO).

Evening boat ride and a beautiful sunset near Snake Creek Pumping Plant on Lake Sakakawea. Photo by Marty Malachowski (DKAO).

Sunrise Coyote at Belle Fourche Reservoir. Photo by Jeff Nettleton (DKAO).

Historical Wagon on the Oregon Trail travelling across Casper Alcova Irrigation District Lands. Photo by Brad Cannon (WYAO).



Third Place Winner

Baby owls at Glendo. Photo by Ray Farrar (WYAO).

Yellowtail Dam Celebrates Fifty Years

A faded 35mm transparency showing an upstream view of the river and canyon in 1963. Note the tunnel at spillway location.

The river has been diverted and the foundation of the dam is being placed in this downstream view.

The construction site was brightly lit during night shifts. Here work on the the dam proceeds showing the power plant foundation and penstocks.

How It Started

The 50th anniversary of the construction of the Yellowtail Dam provides a unique opportunity to reflect on the enormous benefits gained from the iconic Great Plains Region structure's meeting our mission for the American public. The planning, design, and construction efforts over 50 years ago were no small feat. But to add to the appreciation of how this project came about, one has to look even earlier than 1966 when this huge dam was finally finished.

The construction of Yellowtail Dam was part of a larger vision of Reclamation projects brought about by the Pick-Sloan Missouri Basin Program. In 1939, the Reclamation Project Act directed Reclamation to broaden its mission to include hydroelectric power, municipal water supply, flood control, and other uses – transitioning from single-purpose projects toward the multiple use concept we embrace today.

In 1943, William Glenn Sloan, Chief of Engineers for Reclamation, was tasked with studying these options for Reclamation. Colonel Lewis A. Pick was charged with a similar effort for the U.S. Army Corps of Engineers. Pick was an advocate for flood control planning for the Missouri River and tributaries, but also concerned with barge traffic on the Mississippi and Missouri rivers and the future needs of returning World War II veterans.

The efforts of Pick and Sloan differed in the roles each agency would assume in creating a comprehensive development plan for the Missouri River Basin. Congress and President Roosevelt mandated that Reclamation and the Army Corps of Engineers work together in an effort that was authorized by the Flood Control Act of 1944 and became known as the Pick-Sloan Plan. In short, The Corps of Engineers was to develop facilities along the Missouri River, primarily for hydropower and navigation, while Reclamation would build multipurpose facilities on tributaries. Yellowtail was among those sites that Reclamation had already identified as feasible.

Investigations into constructing a dam at the current location had been conducted by the then Reclamation Service in 1903-05 for irrigation, and studies for hydropower actually began in 1913. The final report, finished in 1917, proposed two small dams with one at Kane near the confluence of the Shoshone and Bighorn Rivers (now within Bighorn Lake). Also included were a power plant producing 105,000 kilowatts, along with 500 miles of transmission lines! Also included was a planned 62 miles of canals to irrigate 60,000 acres, which was never realized in the final plans for the Yellowtail Dam.

After the Pick-Sloan Plan was put in place, the scope of development at Yellowtail was revised to include a more economical high dam at the current site with additional hydropower capacity.

Construction Facts and Figures

Construction of the Yellowtail Unit of the Pick-Sloan Missouri Basin Plan was not funded until 1961 and the two dams and power plant were completed in 1966.

The amount of concrete needed to finish the dam included 1,545,664 cubic yards, creating a structure that rose 525 feet vertically, and spanned 1,480 feet at the crest.

Both government and non-government employees clocked just under 570,000 man-hours on the Yellowtail Unit. This took place from May 1961 to final construction in November 1966.

The construction of the dam was a generally safe process up until June 16, 1966, when Bernard Schrader, Yellowtail Power Operation and Maintenance Superintendent, was killed in a mobile truck crane accident.

Penstocks are still visible on the dam and the steel framing of the power plant is being erected.

The power plant is nearly enclosed and the penstock steel work is nearly complete.

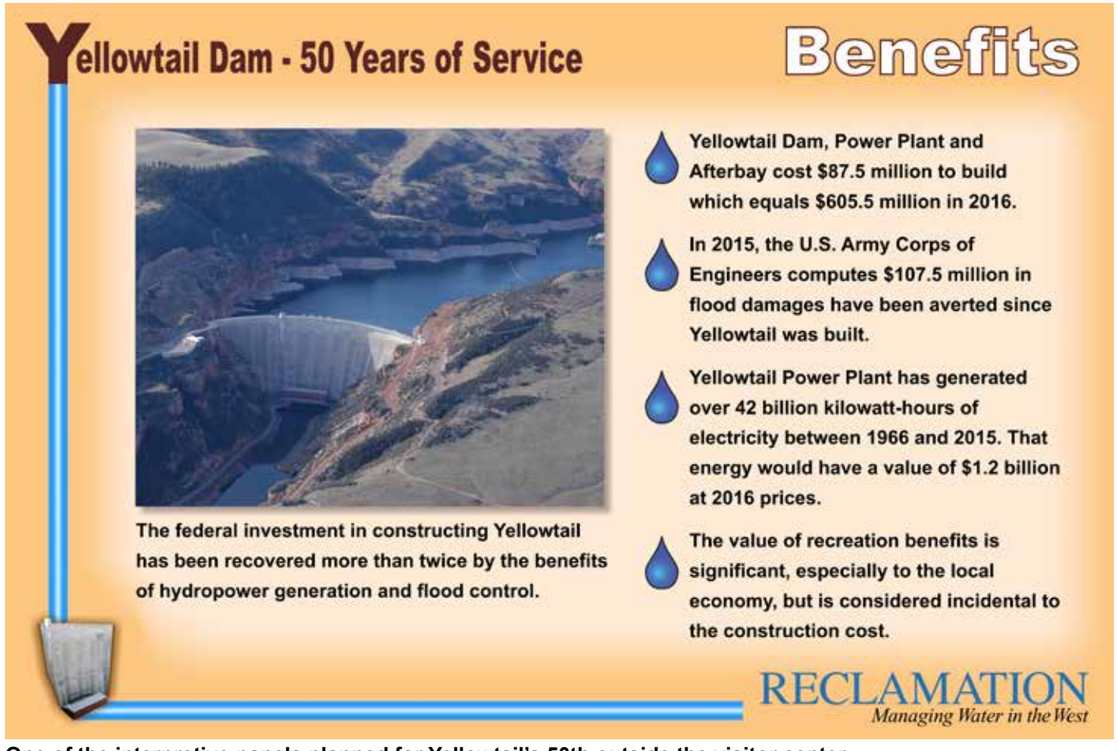
The dam is approaching full height in this aerial overview of the canyon and site.

50 Years of Benefits:

The Bighorn Lake, created once the dam was built, has a flood control capacity of 490,000 acre feet. Water stored in this pool has averted an estimated $170,000,000 in downstream damage since the dam was finally constructed in 1966 (according to ACOE computations as of 12/2015).

Yellowtail Dam is a multi-purpose development, designed to provide not only water, energy and flood control to the American public, but more immeasurable values such as fishing, boating and other forms of recreation. These recreation activities also benefit the American public by adding to the local economy.

Upon the dam's completion, the lands surrounding the facility became a National Recreation Area, managed by the National Park Service.



One of the interpretive panels planned for Yellowtail's 50th outside the visitor center.

Looking to the Future:

The Department of the Interior, in partnership with the Crow Tribe, has entered into an agreement for hydropower development on the Yellowtail Afterbay Dam, downstream of Yellowtail Dam and Power Plant.

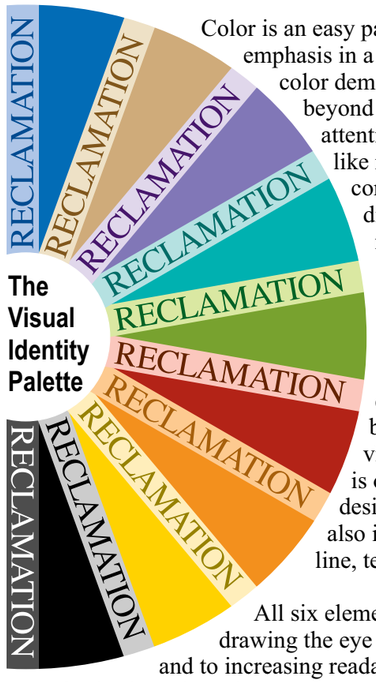
The agreement is part of the Crow Tribe Water Rights Settlement Act of 2010. Under the settlement, the Tribe holds the exclusive right to develop and market power generation on the Yellowtail Afterbay Dam.

The settlement also provides for 150,000 acre feet of Tribal stored water annually for any beneficial purpose by the Tribe. An additional 150,000 acre feet of Tribal stored water may be used annually as supplemental water for the Natural Flow Right during times of Natural Flow shortage under certain terms and conditions

Using COLOR in a Digital World

Introduction

Attracting attention in a crowded room requires volume. Adding color to visual products can be just like shouting. Or it can focus viewers in the same way a polished speaker draws in the audience. Results are a matter of execution.



Color is an easy pathway to creating emphasis in a layout, but adding color demands a purpose beyond merely drawing attention. Reclamation, like most of government, communicates in a direct and factual manner without the emotional undertones used in commercial products. However, effective agency communication benefits from good visual design. Color is one of six classic design elements, which also include shape, form, line, texture and space.

All six elements contribute to drawing the eye to important details and to increasing readability. Consistent use of color in a given document provides the reader visual clues about organization and presentation of facts. That is one reason why Reclamation's Visual Identity (VI) provides a limited palette of colors. They help maintain a coherent and coordinated look across all materials produced with the goal of increasing visibility for the agency.

Stop signs are red and have large type. They are universally recognized as serving a purpose. Similarly, Reclamation's logotype and other design elements using the VI palette lend to a consistent recognition for Reclamation and our mission. The following pages provide information about the use of color and Reclamation's VI palette.

Reasons for Using Color:

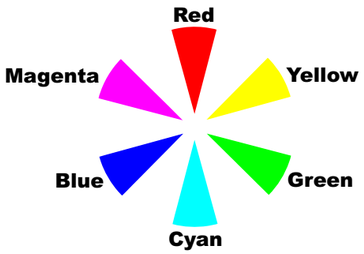
- **Improve usability** by assisting in visual navigation. The use of color can speed searches, improve object recognition for repetitive elements, and quickly convey the document structure to the viewer.
- **Enhance meaning** and reinforce concepts by taking advantage of common responses associated with colors.
- **Establish identity** as in building upon Reclamation's Visual Identity program.
- **Convey mood** especially in photos or backgrounds. *See the back cover of this issue for examples.*
- **Show associations** in especially in complex maps and charts.

Considerations for Color Use:

- **508 compliance** requires care to maintain contrast and readability of text. Never use color as the sole method of conveying concepts. Contact a specialist as soon as potential compliance issues arise.
- **Keep it simple**. Adding too many colors (or too much) can confuse or distract readers and destroy credibility.
- **Use Wisely**. Choosing colors based upon their perceived associations can be construed as advocacy for a given outcome. Be as fair as possible while not inviting unneeded conflict.

Using COLOR in a Digital World

Manipulation by the Numbers

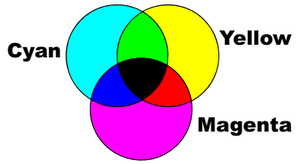


The Digital Color Wheel

Six primary colors make up the digital color wheel. The colors represent the primaries from both subtractive and additive color models illustrated at right.

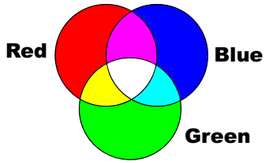
The most common method of describing digital colors is the RGB color space where numbers ranging from 0 to 255 for the values of red, green and blue are assigned to create a given hue. A value of 255 for all three makes white and zero for all three renders black.

Red	Yellow	Green	Brown
R 255	R 255	R 0	R 102
G 0	G 255	G 255	G 51
B 0	B 0	B 0	B 51
Cyan	**Blue**	**Magenta**	**Orange**
R 0	R 0	R 255	R 255
G 255	G 0	G 0	G 102
B 255	B 255	B 255	B 0



Subtractive Color

Magenta, cyan, and yellow are the primary colors used by printers. 100% of all three make black.



Additive Color

Red, green and blue are the primary colors used by monitors. 100% of all three make white.

Tints

Mixing the six digital primary colors make tints just as an artist does with paint. Tints of adjacent primaries complete the digital color wheel.

Luminance, brightness and saturation are terms for similar effects on color.

Luminance, like tints, creates variety of results but only mixes a given color with varying amounts of either white or black.

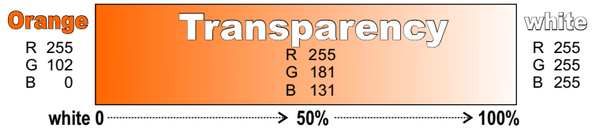
Brightness or ***transparency*** equals luminance when white is used.

Saturation is luminance using only black. In the example at left, the amount of blue in the RGB formula is steadily decreased to eventually yield black.

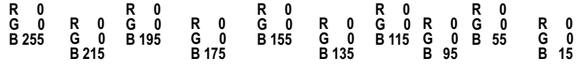
Contrast can be described as adjusting luminance by using both black and white in one software interface.

LUMINANCE

LUMINANCE



SATURATION



Opposites on the color wheel are colors complementary to each other and are pleasing to the eye when used together.

Complementary Colors & Complementary Tints

Colors have long been known to trigger consistent responses in people. Hospitals, corporations, interior decorators and graphic artists employ the use of color to trigger or increase the likelihood of specific responses.

The chart at right shows common associations with colors and how advertisers and marketing agencies employ colors in their products.

The Chart at right shows common associations for major colors. As colors are altered, associations can be subtly changed within the same color family. Typically, richer colors have the strongest influence while adjusting luminance weakens it.

The influence of color on humans is believed to be the result of many factors. Culture, experiences, and biology all play a role in how colors are perceived.

Which color scheme works best for the fictitious product logos above? Check your answer against the typical response for the colors used as shown in the chart.

Specific colors were chosen to convey traffic safety messages such as the risk of electric shock sign from South Africa.

The Psychology of Color - A Matter of Choice

Color Association	Visual Application
Purple — Wisdom, Creativity, Mystery	Creates soothing effect and stimulates consideration of subject matter.
Blue — Trust, Strength, Coolness	Promotes trust and creates a professional appearence and emotional detachment.
Green — Peaceful, Growth, Jealous	Associated with wealth and positive aspects of subject. Easiest for eye to process.
Yellow — Optimism, Unreliable, Warmth	Grabs attention but triggers cautious analysis of subject. Take a second look.
Orange — Confidence, Enthusiasm, Playful	Supports a call to action and urges an immediate response.
Brown — Friendly, Outdoors, Dogmatic	Supports a natural response and conservative aspects of subject.
Red — Energy, Danger, Anger	Raises heart rate and triggers a warning response or increased opposition.
Pink — Healthy, Emotional, Weakness	Infers unreliability when applied to facts or numbers. Evokes emotional response.
White — Purity, Cleanliness, Spacious	Provides a clean, pure space for presentation of facts.
Grey — Balance, Neutrality, Calming	Promotes a willingness to compromise and accept differing viewpoints.
Black — Credibility, Power, Professional	Stimulates clarity, emotional detachment and direct analysis.

Using COLOR in a Digital World

Practical Application

Most Reclamation employees would be considered technical writers who present factual and analytical information to others in a professional setting. The use of color is often considered optional where the black and white printed page has traditionally ruled.

The digital age is marked by the use of electronic media over printed copies and calls for reevaluating that idea. The use of color in documents guides and reinforces visual messages in ways previous generations of federal workers seldom considered. Three communication concepts center on the use of color: marketing, attention, and retention.

Marketing: In government we seldom think of ourselves as marketers of products and services but to a degree that is what we do. While we believe our messages are logical and concise, we often fail to recognize that emotion plays a significant role in how those messages are accepted and interpreted.

Colors shape the emotional landscape of visual communication. What is seen triggers subliminal responses and help create a specific feeling. For our message to be accepted it must be presented in a way that is compatible with our audience. Traditional black and white pages have just become passe to a public bombarded with color.

That is not to mean that color should be used just because it can. Overuse decreases effectiveness just as choosing random colors for different parts of a page. The best approach is to have a plan for using color when beginning a project. The use of a color scheme is one approach. Choosing the right colors for the intended audience for Reclamation is guided by the Visual Identity palette. These colors are intended to create public recognition of agency products.

Attention: Color grabs the eye and guides it across a page. Human brains are not wired to instantly recognize text. We first see colors and shapes and grasp a concept of the whole page. The last thing we do is begin to digest the text. Color provides a key component to fixing attention to the page and leading to comprehension.

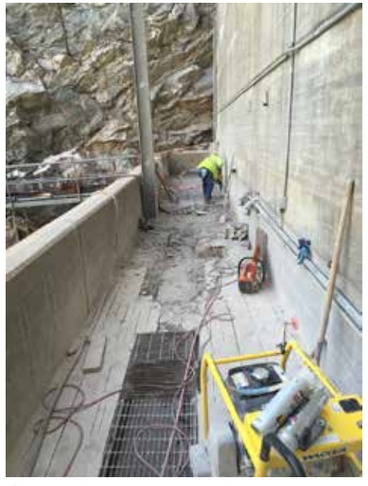
Retention: Once an emotional background has been established and the attention of the reader secured, the real messaging begins. Consistent use of color provides a structural path for readers to follow and dramatically increases their retention of the concepts presented. When readers become familiar with a color layout, the reading speed is increased and key concepts reinforced without additional effort.

Choosing images to create a mood: A photo contest image of Cemetary Island at Canyon Ferry by Gary Valasek (above) has been retouched to imitate altered conditions at Canyon Ferry Reservoir. Which image would you use? The original reflects a bright sunny day.

The altered image (above) reflects a somber day during wildfire season. For more examples see the back cover of Plains Talk.

Seminoe Concrete Repair

Injecting epoxy to repair crack.



Concrete removal on tailrace deck.

Installing new stairway.

By Jay Dallman, WYAO.

A concrete repair and stop log replacement project was recently completed at Seminoe Dam with Great Plains Region Construction Services provided contract administration and inspection for the project.

The river outlet works and stilling basin at Seminoe Power Plant was identified in a Comprehensive Review to have deficiencies in the concrete located around the outlet works and the tailrace deck. The stop logs were constructed as part of the original Seminoe Dam and Power Plant in 1939. Over 75 years of wear and tear took its toll. They no longer provided an adequate seal to allow periodic maintenance of the power plant draft tubes and river outlet gates.

The stop logs function as massive steel slide gates, each composed of an upper and lower section that fit into vertical tracks. Each lower section weighs about 6,500 pounds, and the upper sections weigh about 3,000 pounds. They were designed so each could block one of the two river outlet gate openings, or both could be used to block the twin outlets from any one of the three generator draft tubes.

The tailrace deck also had deteriorated concrete and the stairway leading to the tailrace deck did not meet OSHA standards. Engineers from TSC analyzed the problem issues and came up with a design to address the repairs.

The specification was issued by Great Plains Region Acquisition Services on July 17, 2015. The contract was awarded to the low bidder, RSCI (Record Steel and Construction, Inc.), from Boise, Idaho.

The contractor mobilized on February 8, 2016, beginning with construction of a cofferdam to protect the work site from flows passing through Seminoe Power Plant.

A subcontractor, Global Infrastructure, based in Griffith, Indiana, provided diving services for installation of the cofferdam in the stilling basin of the outlet works. Contractor used a 60 ton Link

New reinforcing bar in river outlet works center pier. Photo at right shows the pier after reconstruction is complete.

Belt crane to put the components of the cofferdam in place. The dive subcontractor anchored the cofferdam to the training wall and retaining wall.

Upon completion of the cofferdam, the work area between the upstream face of the dam and the cofferdam was dewatered using a 4-inch pump. The contractor cut around the concrete areas requiring repair. The repair areas were excavated using chipping hammers to the required design depth. New steel reinforcement and concrete was placed in the repair zones. Cracks were sealed using a pressurized epoxy grout system. The contractor completed all of the concrete repairs in the tailrace area protected by the cofferdam by March 23. The contractor removed the cofferdam from the river by April 6, to allow for potential water releases through the river outlet works.

The tailrace deck was resurfaced by saw cutting the surface, using jack hammers to remove deteriorated concrete, and then adding a new layer of fresh concrete. Work on the tailrace deck concrete was completed by May 3.

The repairs allow the power plant crew safely perform future maintenance on the jet flow gates and the generating units. The new stop logs minimize leakage and ensure that the maintenance can be accomplished safely and more efficiently. The new tailrace deck, stairway and associated security fence will provide safer access for operation and maintenance of the stop logs and outlet works. The Contractor will test the new stop log sections in the fall following the irrigation water delivery season.

D Q Y Y A Q A P P A D I G I T A L N V R K S
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S S S C C O N S T R U C T I O N Y H C N X W
Y G T O W X S G I R L R W Z E S C A

Find the Words

Find these terms from this issue of Plains Talk. They can be spelled forward, backward, in straight lines and using only one letter twice.

- ☐ ACCESSIBILITY
- ☐ CROW
- ☐ RECREATION
- ☐ ACCOMPLISHMENTS
- ☐ DIGITAL
- ☐ REFERENCE
- ☐ BASIN
- ☐ DIVERSION
- ☐ REFORMULATION
- ☐ CBT
- ☐ GARRISON
- ☐ RESOURCES
- ☐ CHALLENGES
- ☐ GLENDO
- ☐ SAFETY
- ☐ COLOR
- ☐ INTERNSHIP
- ☐ SCADA
- ☐ CONSERVATION
- ☐ NAWS
- ☐ STUDY
- ☐ CONSTRUCTION
- ☐ PATHWAYS
- ☐ TAINTER
- ☐ CONTEST
- ☐ PIPELINE
- ☐ TIMELINE
- ☐ CONTRAST
- ☐ PLC
- ☐ YELLOWTAIL

COLOR

Above are two historic black and white images of the Civilian Conservation Camp for the Kendrick Project in Wyoming. Adding blue to the infirmary image makes it appear colder and more sterile. Orange added to the reading room makes it warmer and nostalgic.

The Yellowstone River oil spill cleanup photo below illustrates a slghtly over exposed image at left and a corrected copy on the right.

For more about color see the article inside.