

RECLAMATION  
*Managing Water in the West*

Summer 2012

# Plains Talk

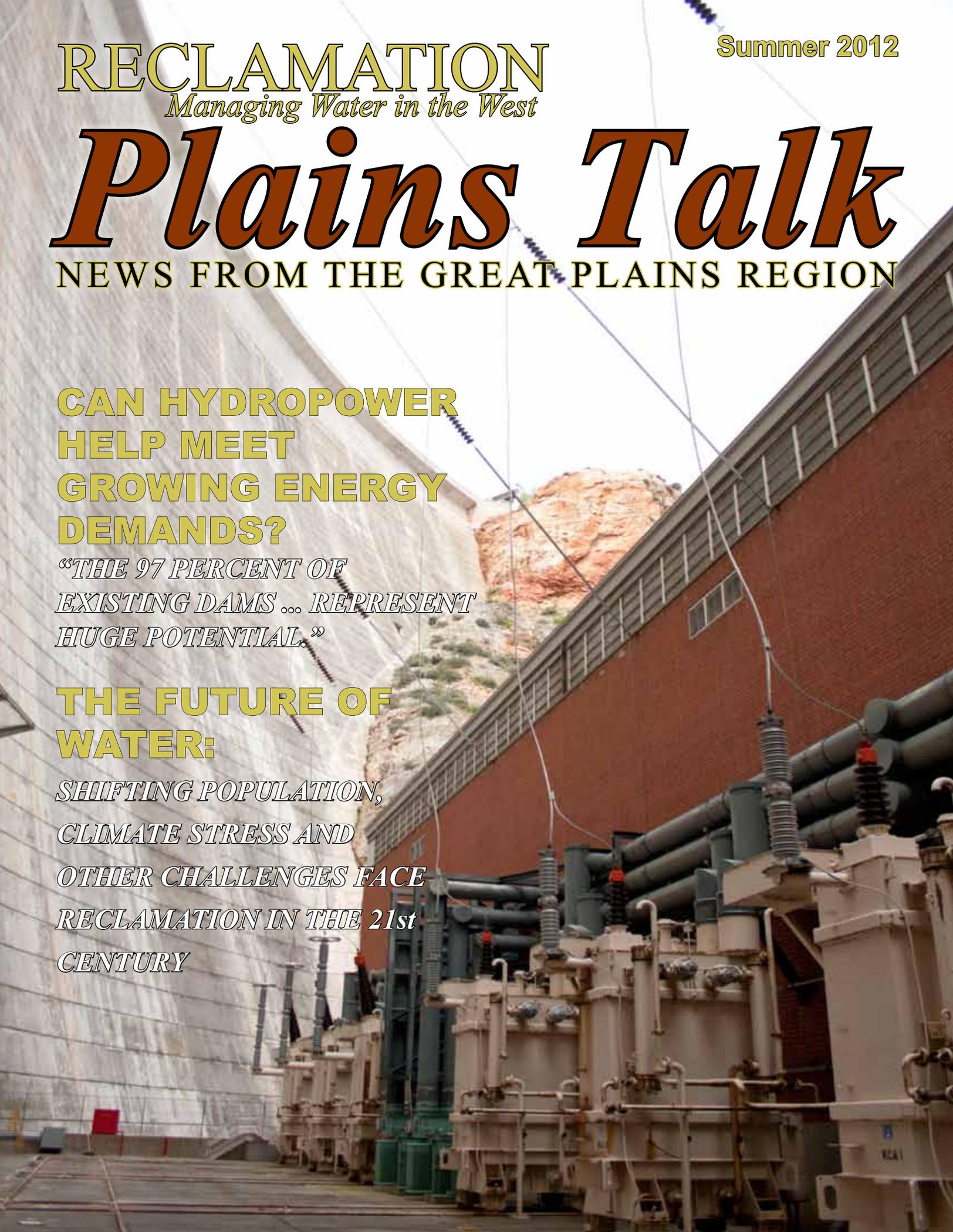
NEWS FROM THE GREAT PLAINS REGION

## CAN HYDROPOWER HELP MEET GROWING ENERGY DEMANDS?

*"THE 97 PERCENT OF  
EXISTING DAMS ... REPRESENT  
HUGE POTENTIAL."*

## THE FUTURE OF WATER:

*SHIFTING POPULATION,  
CLIMATE STRESS AND  
OTHER CHALLENGES FACE  
RECLAMATION IN THE 21st  
CENTURY*



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# Hydropower:

## The Search for Untapped Energy

By Sterling Rech,  
Public Affairs Specialist, GPRO

“Every drop in elevation on every river and stream in the country holds potential energy,” said Great Plains Deputy Regional Director Gary Campbell.

“Right now, only three percent of existing U.S. dams produce power – that represents a huge untapped source of power for American cities, farms and industry,” Campbell said.

As a growing global population creates demand for more water and energy, finding ways to address this challenge using hydropower and other sources of renewable energy offers major opportunities.

The U.S. currently consumes more than 19 million barrels of oil per day. The nation has depended on coal and oil as two primary engines of economic growth because of accessibility and affordability.

But with instability in oil producing nations and growing environmental concerns, the nation is looking seriously at alternatives.

In 2006, the United States Geological Survey (USGS), analyzed the energy consumption of the U.S., estimating that nearly 50 percent of the nation’s energy comes from coal, 20 percent from natural gas, 19 percent from nuclear energy and less than 10 percent

from conventional hydroelectric power generation and other forms of renewable energy like solar and wind power.

According to a 2009 report by British Petroleum, “the amount of proven oil reserves waiting to be exploited fell last year for the first time in a decade. For every four barrels used today, only one new barrel is found.”

The U.S. Department of Energy says that while global oil supplies are not necessarily diminishing,

**“The 97 percent of existing dams in the United States that are not currently producing power represent huge untapped potential.”**

**- Great Plains Deputy Regional Director Gary Campbell**

cheap, accessible, and easy to refine supplies are on a downtrend.

“Because fossil fuels have been so critical in the expansion of industrial societies, it’s hard for some folks to envision a world where those resources aren’t drivers behind our future prosperity and success as a country,” said Campbell. “But 70 or 80 years ago, much of our nation’s energy came from hydropower, so the potential exists. We know that

from experience.”

Hydropower fills a crucial role in America’s energy supply, and offers the potential for reliable domestic energy independence.

More than 97 percent of renewable energy comes from hydropower, and the United States is among the leading producers worldwide. The Bureau of Reclamation was a key player during the development of the nation’s hydropower infrastructure.

“Reclamation is the second largest producer of hydroelectric power in the U.S., and pioneers in the field,” said Campbell. “I predict that much of our future planning will be geared toward hydropower development on existing facilities.”

During the first part of the 20th century, hydroelectric power plants were built to power the machines needed to build dams and reservoirs. Hydroelectricity ran sawmills, giant shovels, concrete plants and other machines that helped shape the West as we know it today.

Eventually, surplus power was sold to distribution systems, as well as local farms and towns around dam sites that benefited from the low-cost electricity.

As the booming nation thirsted for power to drive a growing industrial base, the hydropower potential of Reclamation’s dams were soon

tapped as a low-cost and renewable source of electricity to fuel growing economies in the West.

“For something that emerged as a by-product of water development a mere century ago, hydropower is more important now than it has ever been,” said Campbell.

During the 1940s, hydropower accounted for 75 percent of electricity consumed in the West, and about one-third of total U.S. electrical energy.

During the ensuing 60 years, the nation’s hydropower use declined as fossil fuels boomed, but America’s focus on renewable energy in the 21st century has brought hydropower back onto the scene.

“Our energy frontier is changing,” said Campbell, “and hydropower is

a proven alternative that has been successfully used for decades.”

In the U.S., 81 percent of the electricity produced by renewable sources comes from hydropower.

Worldwide, about 20 percent of all electricity is generated by hydropower, the cheapest and most efficient form of energy available in the world.

Modern hydro turbines are capable of converting up to 90 percent of available energy into electricity, while the most efficient

fossil fuel plants are only 50 percent efficient.

Hydropower does have its challenges.

“Geographic location, precipitation and weather patterns are major influences in a dam’s storage capacity and power production capabilities,” said Campbell.

“Those challenges aside, there is great potential for hydropower in

increasing role in America’s energy picture.”

Studies done by the USGS also show that conventional hydroelectric power plants generation accounted for as much as 10 percent of the nation’s energy in 1995.

As of 2009, only 2,400 - or three percent - of the nearly 80,000 dams in the United States were used to generate power.

“As with all of modern projects, we have to take into account environmental impacts, but the reality is that there is a lot of potential power generation that is left untouched. There exists enormous potential for retrofitting existing dams to generate power,” said Campbell.

“The 97 percent

of existing dams in the United States that are not currently producing power represent huge untapped potential,” Campbell said.

“Throughout the 20th century, Reclamation was a pioneering force in the development of hydropower in the United States, and in many ways, the 21st century offers as much, if not more, of an opportunity for our agency to provide solutions and enable the Western United States to continue to grow and fulfill its potential.”

### Hydroelectric Generators In and Around the United States



Source: U.S. Energy Information Administration, *Today in Energy*, June 10, 2011, derived from *Energy Velocity*.

America’s energy future.”

U.S. energy demands are only likely to increase during the 21st century.

“Despite having been around longer than other developed forms of energy, hydro still remains one of our greatest untapped renewable resources as a country,” Campbell said.

“Hydropower means clean and cheap energy. We are producing it today, and the future holds the potential for hydropower filling an

## By the Numbers:

# GP's Facilities Offer "Hydropotential"

By Sterling Rech,  
Public Affairs Specialist, GPRO

Reclamation has been contributing to the nation's supply of clean, renewable energy for more than a century.

GP operates 80 of Reclamation's more than 600 dam and transfer facilities in the western United States.

GP has 20 hydroelectric power plants, generating approximately 3.6 billion kilowatt hours of electricity each year, enough energy, at current levels of consumption, to power more than 250,000 homes.

"There's ample room for development of additional power generating capacity on existing facilities," said Gary Campbell, Deputy Regional Director of the Great Plains Region.

Programs like WaterSMART and Rural Water allow GP to advance

the availability of clean energy and water supplies in the West.

As part of the Federal Energy Regulatory Commission (FERC) and Lease of Power Privileges (LOPP) activities, GP is currently retrofitting projects that will substantially increase power production via existing facilities that were either not utilized or under utilized in the past.

The Great Plains Region is currently working on projects at the Carter Lake Outlet outside Loveland, Colo., and Pueblo Dam's modification, both examples of retrofitting that are expected to be complete in 2015.

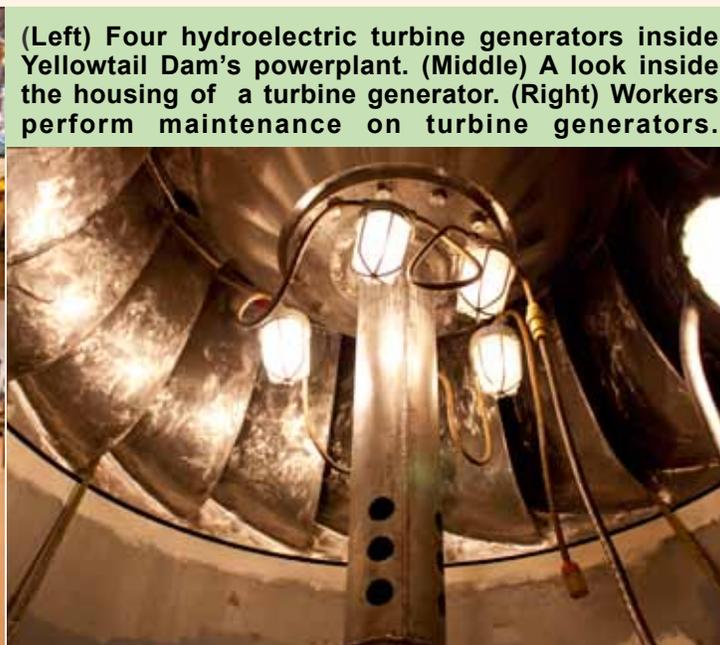
"These two projects alone, when completed, will provide a proposed average annual generation of nearly 30 million kilowatt hours of electricity, enough to power 3,000 homes for an entire year," said Campbell.

"These projects are prime examples of the power-generating capacity the Great Plains possesses."

That amount of electricity would also be enough to power 66 million computers, 7.2 million refrigerators, or fuel nearly 208,000 gas-powered vehicles for a year, assuming the vehicle averages 25 miles per gallon and travels approximately 13,000 miles a year.

Retrofitting existing dams for hydropower has real potential to make a huge difference in how we consume energy in the U.S.

"In the 20th century, hydropower was used to power the machines needed to construct dams, said Campbell. "In the 21st century, hydropower will be called upon to fuel the growing demands of a growing nation."



(Left) Four hydroelectric turbine generators inside Yellowtail Dam's powerplant. (Middle) A look inside the housing of a turbine generator. (Right) Workers perform maintenance on turbine generators.

# From the Mountains to the Great Plains: A Snapshot of GP's Power Facilities

The Great Plains Region operates and maintains 20 hydroelectric powerplants, producing enough electricity to meet the demand of more than 250,000 homes each year. Hydropower is the country's largest, cleanest and most efficient source of renewable energy.



# Always On:

## GP Harnesses the Power of the Internet



morning, kept the public informed of the elevation, average inflows and outflows, and snowpack levels for river systems around the Great Plains Region. The portal also connected users to other flood information sites such as U.S. Geological Survey's flood information site, the National Weather Service's localized flood and high flow data pages, and the U.S. Army Corps of Engineers' emergency operations pages. In addition, after the primary crisis had passed, GP's Flood Response Information page serves to provide an archive of flood information from the 2011 Water Year.

The regional public affairs office, in conjunction with Information Technology Services, created several other projects in 2011.

In spring 2011, the region designed a Snowpack & Reservoir Levels Web page, which proved to be a well-timed addition during flood season."

"What we were trying to provide was snowpack and reservoir level pages so that people visiting our site could easily read reservoir level and snowpack level information as conditions changed," said Tyler John-

### By Tobias Taylor, Visual Information Specialist GPRO

The Internet never sleeps.

In the 1990s, the burgeoning World Wide Web was often referred to as an "information superhighway," a term coined by Korean American artist, Nam June Paik in 1974.

In 2012, the Internet has truly evolved into a massive conduit of information, allowing the open exchange of information and ideas between people and organizations, 24-hours-a-day.

For Reclamation, that means sharing what is happening around the region right as it happens, not days or weeks later.

"I agree completely with my son James when he said, 'Internet is like electricity. The latter lights up everything, while the former lights up knowledge,'" said Kerry Packer (1937 – 2005), Chairman of Pub-

lishing and Broadcasting Limited, Australia.

The responsive nature of the Internet helps the Great Plains Region share information with the public. With advancing software and integrated technology, creating and publishing new Web pages takes a relatively short amount of time, allowing for well-timed distribution of information.

This is especially critical during emergency operations, such as flooding.

In spring 2011, the Great Plains Region created a Flood Response Information page to provide daily updated information to members of the public, affected landowners and other federal agencies.

The page served as a portal, displaying real-time flood information from around the region in a single consolidated location. River basin bulletins, posted each



**GP's Flood Response Information page provided real-time flood information during spring 2011 flooding.**



son, Regional Public Affairs Officer. Current reservoir and snowpack levels, along with historical averages, are displayed on an interactive map showing the location of each facility across the region. An average of 2,500 people visited the page each month during the 2011 spring flooding.

“The Internet has opened up many possibilities for Reclamation to interact with the public by sharing real-time data and updates on our routine operations,” said Roger Michel, Hydraulic Engineer in the regional office.

Real-time data systems such as the hydrologic and meteorological monitoring stations (HydroMet), agricultural weather information (AgriMet), and boat launching information generate more than 85 percent of visits to the region’s Internet site each year.

These real-time data systems provide a diverse range of information. For instance, users accessing GP’s HydroMet system can easily locate current reservoir storage content at Twin Buttes Reservoir, Texas, or the accumulated precipitation for Helena Valley, Mont., or if reservoir conditions are favorable to launch a boat from the Medicine Bow boat ramp at Seminole Reservoir, Wyo.



**The Snowpack & Reservoir Level page provides real-time reservoir and snowpack levels displayed on an interactive map.**

“For a region that spans nine states and covers 856,792 square miles, it’s handy to be able to pull up accurate data with the click of a mouse,” said Craig Scott, NKAO, Civil Engineer. “Acquiring information instantly can be especially beneficial if we run into issues with one of our dams or facilities, like in the case of Red Willow Dam, outside McCook, Neb.”

Discovery of cracking in the Red Willow Dam embankment in Oct. 2009, initiated a Safety of Dams

**The Public Information Portal displays information related to Red Willow Dam/Hugh Butler Lake.**

Corrective Action study in late Feb. 2010. To keep the public informed on all the events the region created the Red Willow Dam/Hugh Butler Lake Information Portal. Updates on events taking place at Red Willow have steadily increased the amount of information the portal provides, such as the initial announcement of the Corrective Action study, press releases, and current construction updates.

GP’s website also provides visitor a chance to view many iconic scenes from around the region, both current and historic photos from Reclamation’s pioneering days. Photo galleries show the construction progress on Yellowtail Dam in Montana from

1963 to 1966, photos employees submitted to the 2010 and 2011 GP Photo Contests, and the GP Rope Team inspecting facilities. Putting the Great Plains Region on display helps the public and employees better understand how vast the region is and how many different dams and facilities we operate.

“It helps put our work into perspective for people,” said Joe Rohde, Regional Security Officer.

During the year, employees captured photos of the spring flood, an oil spill on the Yellowstone River, and many other events from around the region. As the amount of images and other media increased, a place to display that media was needed. A multimedia section went live on the site with photo galleries, publications, videos and podcasts.

The “always on” nature of the Internet makes information available to the public even when employees are out of the office. Questions can be answered and information viewed when needed. The ability to get information is not limited to normal business hours.

**Putting the Great Plains Region on display helps the public and employees better understand how vast the region is and how many different dams and facilities we operate.**



# Hall Recognized for Advancing Rural Water



**Regional Director Mike Ryan presents Ted Hall (left) with the Department of the Interior's Superior Service Award.**

**By Patience Hurley,  
Public Involvement Specialist, DKAO**

Ted Hall was presented with the Department of the Interior's Superior Service Award on Feb. 16, for his contributions to Reclamation's Rural Water program.

Great Plains Regional Director Mike Ryan presented the Superior Service Award while Ted was in Billings conducting a Value Engineering (V-E) study.

Since 1989, Hall has made Reclamation's Rural Water program his life. This award signifies the second time in his career he has been recognized by the Department of the Interior for his significant contributions to both the Rural Water program and Reclamation. In 2009, Hall, along with several other engineers and contractors, received the Partners in Conservation Award from the Department for innovative work on the Lewis and Clark Project.

"Ted's experience in all aspects of rural water projects has definitely been an asset to Reclamation," said Arden Freitag, Dakotas Area Office Chief, Rural Water Construction and Operation and Maintenance. "His recommendations to project sponsors during Value Engineering studies and construction resulted in both

time and cost savings."

As a lead engineer, Hall holds responsibility for managing the Dakotas Area Office Rural Water program using his applied engineering experience and knowledge to assure quality and reliable construction.

"We felt that with Ted's commitment to carrying out both the V-E studies and rural water construction for the Lewis & Clark and Mid-Dakota projects, he was very deserving of this award," said Freitag.

Most recently, Hall assembled and led a diverse team of people to conduct the Snake Creek Pumping Plant Brick Repair V-E study and the Ketterling's Point Riprap project. Under his leadership, the team provided options, solutions, and cost savings of approximately \$200,000 that otherwise could not have been realized.

"It has been extremely gratifying to work with rural water systems, their board members, consultants, attorneys and individual users, to be a small part in the delivery of high quality water to rural areas," said Hall. "The pleasure of being a small part of helping a rural Highmore, SD, couple hookup to the Mid-Dakota Rural Water Project after hauling water for 50 years is quite satisfying."

With 31-years of federal service under his belt, Hall continues to learn and share his knowledge and expertise with coworkers, customers and partners.



**Ted Hall beside a 54-inch water pipeline for the Lewis and Clark Regional Water Project between Vermillion and Sioux Falls, South Dakota.**



# Plant Operators Get “SCADA-fied!”

By Tom Thompson,  
Civil Engineer, DKAO

Using funds provided by Reclamation through regular appropriations and the American Recovery and Reinvestment Act, the Standing Rock Sioux Tribe awarded a contract for construction of a water treatment plant and Indian Memorial Intake Pump Station in April 2010.

A ground breaking ceremony for the Standing Rock Water Treatment Plant, which is designed to provide water for the entire Standing Rock Indian Reservation, was held June 2, 2010, and work began that same month.

The contract included construction of a three-million-gallon-per-day (5 mgd ultimate capacity) water treatment plant adjacent to Highway 1806, between the communities of Kennel and Wakpala, South Dakota.

By May 2012, the contractor



**(Above) FEB 1, 2012 - Raw water pipeline being connected to the Standing Rock Water Treatment Plant, approximately 13 miles north of Mobridge, South Dakota. (Lower right) Joe Castrop, Micro-Comm, Inc., explains the new SCADA system to water treatment plant operators.**

had finished the site work, foundation, floors, walls and roof, as well as interior work, including the installation of treatment equipment.

On February 16, in preparation for operations at the newly constructed water treatment plant, Joe Castrop from Micro-Comm, Inc., provided Supervisory Control and Data Acquisition (SCADA) training for plant operators from the Standing Rock Rural Water Supply system.

Plant operators control operations through the SCADA system. SCADA systems monitor water treatment plant operations by gathering data from sensors at the facility and then sending the information to a central computer system.

**(Below) The newly constructed Standing Rock Water Treatment Plant.**



The training was a four hour session held at the Standing Rock Water Treatment Plant, approximately 13-miles north of Mobridge, South Dakota, on the Standing Rock Indian Reservation.

The Indian Memorial Intake and Pump Station, which is part of the project, draws water from Oahe Reservoir and pumps it approximately 13-miles north to the water treatment plant.

Reclamation began pumping water to the communities of Kennel and Wakpala in May, and a ribbon-cutting ceremony was held on June 12.



# Anniversary Year Spectacular: Fry-Ark and C-BT Hit Milestones

By: Kara Lamb, Public Involvement Specialist, ECAO

(Above) Olympus Dam, which holds back Lake Estes, was constructed from 1947-1949. While Lake Estes is on the Big Thompson River, roughly 97 percent of its water is imported through the Colorado - Big Thompson project and the Estes Powerplant.

“It takes a while to build a project.” That is the opening line to the Fryingpan-Arkansas Project’s commemorative anniversary film due out later this year. The film celebrates the decades spent lobbying for the project, and the past 50 years of its operating history.

Today, the Fry-Ark stands out as one of the largest water diversion and delivery projects in the state of Colorado.

It is not the only federal project with claim to that title. The Colorado-Big Thompson is also being celebrated this year and has its own commemorative film in the works.

Both projects, under the oversight of the Eastern Colorado Area Office, hit important milestones in 2012. The Fry-Ark turns 50 and the C-BT turns 75-years-old.

## ONE MISSION, TWO PROJECTS

For Colorado water projects, 2012 is a year of anniversaries and celebrations.



Fry-Ark and C-BT mark major anniversaries, while around the state, significant pieces of water-related legislation are being commemorated.

With so much emphasis on Colorado water history, old stories are coming back to life.

“Do you know who Alva B. Adams was?” asked Bob Rawlings, owner and publisher of the Pueblo Chieftain newspaper. Rawlings was responding to interview questions from the crew documenting the Fry-Ark Project for the 50th anniversary commemorative film.

Adams was the Colorado Senator well known for his vigorous lobbying on behalf of the C-BT Project. In turn, he became the namesake of that project’s most famous feature, the 13 mile-long Alva B. Adams Tunnel that makes possible the largest trans-mountain water diversion in the state.

“Did you know,” he asked, “that [Adams] he was from Pueblo? Did



you know he was one of the original owners of the newspapers that became the Chieftain?”

According to Rawlings, the reason a senator from southeastern Colorado lobbied so hard for a project that would serve communities to the north was, “because he knew the C-BT was setting precedent for what would become the Fry-Ark ... and he knew how badly we needed that water.”

Fulfilling a need for supplemental water is one thing both projects have in common.

Today, the Fry-Ark provides water down a huge section of the Arkansas River corridor, from Salida, in the mountains, east to Lamar, Colo., near the Kansas border. Fry-Ark water also travels north to Colorado Springs.

More than 650,000 people rely on

the Fry-Ark for their water.

Similarly, the C-BT provides supplemental water to about 800,000 people. It serves a large triangle of northern Colorado from Estes Park in the mountains, to Boulder, then northeast to Sterling, near the Nebraska border.

The similarities end there.

“These two trans-basin diversion projects, which seem similar at the outset, are actually very different,” said Mike Collins, Area Manager of the Eastern Colorado Area Office.

He was referring to a common assumption that because both projects divert Colorado River water underneath the Continental Divide for delivery to the Front Range, that rules and regulations for the projects are the same.

“That assumption is not accurate,” said Carlos Lora, a water

scheduler for the C-BT. “Even the way the projects were authorized is different.”

“Well, for one thing,” said Bob Rice, ECAO Water Rights/Repayment Contracts Specialist, “the authorizations for the projects are separated by 25 years. FDR approved the first federal funding for the C-BT in 1937. John F. Kennedy signed the Fry-Ark into law in 1962, but signed a public law. Franklin D. Roosevelt signed a Departmental Appropriation Act.”

Operations diverting and delivering the water vary. For example, there is more substitution and exchange of water on the Fry-Ark Project than the C-BT.

Historically, 80 percent of the water that flows through the Fry-Ark facilities is actually native, or non-project water.



F382-706-12316 MA Mt. Elbert Pumped-Storage Powerplant-- Bureau of Reclamation's Fryingpan-Arkansas Project, Colorado.

View looking west showing status of concrete formwork and placements for the beginning of the lower intermediate section of the powerplant structure. Forms are being set in position for penstock anchor block placements Nos. K-1A and K-2A to the right. The backfill varies from El. 9125± to El. 9130± along the east side.

Eby & Company, A Joint Venture, Specifications No. DC-6915 2-22-73 Bureau of Reclamation Photo by C. W. Siegel Requested by J. H. Jacobson



F382-706-4402NA Ruedi Dam--Fryingpan-Arkansas Project, Colorado

View looking upstream showing gate chamber access shaft collar in the left of the photograph and spillway chute concrete and forms in foreground, Station 10+99.42 back to Station 10+65 at end of finished concrete. Lockheed Shipbuilding and Construction Co. Specifications No. DC-6110 8-29-67 Bureau of Reclamation Photo by D. O. McCabe





**(Above) The Adams Tunnel was constructed from 1940-1947. Carts were railed in with supplies and goods, and concrete lining covered the railroad tracks and the electrical lines were moved to the top of the 9-foot diameter tunnel. (Below) The Estes Penstocks, which were constructed from 1948-1950. Without the penstocks bringing diverted Colorado River water to the Estes Powerplant, there would be no Lake Estes in the middle of Estes Park, Colo.**

The Fry-Ark was built on top of previously existing projects that still operate today.

“We move [other project] water through our facilities. It’s not all Fry-Ark water,” said Vaughan, “and that makes for a lot of constant collaboration with other water operators in the state.”

### **NUTS AND BOLTS**

“I guess you can say operating the C-BT is pretty straight forward,” said Lora. “When we bring water from the West Slope Collection System, we don’t have to work with a host of other operators or cities.”

On the C-BT, Granby Reservoir, on the West Slope of the Continental

Divide, is the primary collection and storage vessel. It is the second largest reservoir in the state, storing up to 539,000 acre-feet of water.

In contrast, Turquoise and Twin Lakes reservoirs on the Fry-Ark sit on the East Slope of the Continental Divide. Although they serve a similar function to Granby, storing water diverted from the West Slope, both features were in existence prior to construction of the project.

By the time Fry-Ark was authorized in 1962, the cities of Aurora and Colorado Springs were using Turquoise Reservoir for their Homestake Project.

The City of Pueblo was using Turquoise for their Busk-Ivanhoe system.

Twin Lakes Canal Company, which today is owned by Aurora, Colorado Springs and Pueblo, was using Twin Lakes for water diverted above Aspen.

Reclamation enlarged both Turquoise and Twin to accommodate the Fry-Ark Project.

Another difference in project facilities is the production of hydropower.

The C-BT hosts six powerplants: Green Mountain, Marys Lake, Estes, Pole Hill, Flatiron and Big Thompson.

The Fry-Ark project hosts one hydroelectric powerplant, Colorado’s largest, Mt. Elbert, on Twin Lakes Reservoir.

Together, the C-BT’s powerplants produce 759 million kilowatt hours of electricity a year, enough



to power 58,300 American homes.

On the Fry-Ark, just one powerplant produces half that much energy. In 2011, the Mt. Elbert plant produced 355 million kilowatt hours of electricity, enough to power 35,000 American homes.

## THE NEXT 50-100 YEARS

Today, changes in water supply are becoming prevalent across the West.

Across Colorado, in particular, state and federal agencies, water districts, and non-profit groups are looking forward to the next 100 years with a keen eye on the water supply.

Reclamation is maximizing use of its existing facilities to help meet growing demands.

New municipal projects are moving through their permitting process.

Water conservation is being highlighted by environmental groups hoping to stave-off more development.

As Reclamation works through National Environmental Policy Act compliance on proposed projects like Windy Gap Firming for the C-BT, and oversees the municipal Southern Delivery System's physical connection to Pueblo Dam on the Fry-Ark, other changes are on the horizon.

"We're looking at how we issue contracts," said Rice. "From consideration of market rate pricing, to how we apply revenue across project features, the way we conduct business is evolving."



P382-706-10460A Initial Construction for Pueblo Dam-- Bureau of Reclamation's Fryingpan-Arkansas Project, Colorado. Aerial view of the excavation for Buttriss Nos. 8 through 15. The excavation of the spillway stilling basin is not completed as the bottom is 12 to 15 feet above finish grade. Formwork for Blocks 1 and 2 can be seen in the river plug. Dravo Corporation, Specifications No. DC-6820 3-3-71 Bureau of Reclamation Photo by C. W. Siegel Requested by L. V. George

The hydropower side is also changing. Once thought to have utilized all the best dam sites for power generation available in the West, Reclamation is now looking at maximizing existing features for small hydropower.

The Lease of Power Privilege program, or LOPP, is on the move. Northern Water, along with its Municipal Subdistrict, provides water to Northeastern Colorado from the C-BT and Windy Gap projects, and has already begun construction on an LOPP powerplant on the C-BT's Carter Lake Dam #1.

Project bids have been awarded at Pueblo Dam on the Fry-Ark and at

Granby Dam on the C-BT.

These changes, coupled with the services both projects already provide, carve a central niche for water projects in Colorado, and the West.

"Myriad challenges - and opportunities - exist for both the Fry-Ark and C-BT," said Collins. "It is our job to navigate the challenges and usher in the opportunities so that each project maintains its full functionality to meet the needs of the generations that will follow us."

With time marching forward, it will be interesting to watch the histories and legacies of both the Fry-Ark and C-BT continue to evolve.





# What Do You Do?

By Doug Epperly, Environmental Compliance Specialist, GPRO

As the Environmental Compliance Group Lead stationed in the Regional Office, my job is about finding solutions.

Environmental compliance ensures Reclamation projects are consistent with applicable natural and cultural resources laws.

I help make sure our projects measure up to our agency mission to, “manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.”

My responsibility is to help determine when an environmental law may be triggered by Reclamation’s actions, identify the environmental

issues associated with those actions, describe the impacts, and find ways to avoid or reduce impacts, or in other words, find solutions to problems before they happen.

For example, Reclamation authorizes construction of several miles of pipeline each year. After a pipe-

**“I help make sure our projects measure up to our agency mission.”**

line is installed, the bare soil covering the pipe provides a potential home for weeds.

Weeds can force out native grasses and shrubs, which can spread onto

neighboring lands, affecting crops and landscaping.

If we allow invasive weeds to expand, we’re not being good stewards to the vital land and water resources we develop, or to neighboring lands.

So, we look for solutions. One solution we might evaluate involves the pipeline alignment be seeded with desirable grasses.

Helping desirable grasses and shrubs flourish means invasive weeds and plants are unable to grow and spread in the same area.

The process seems fairly simple, but it isn’t always so straightforward. There can be any number of wrinkles along the way.



This is where I spend most of my time – ironing out the wrinkles.

Many of Reclamation’s projects, and the impacts from those projects, are complicated. Finding suitable ways to resolve these issues can take a lot of time, and sometimes years.

I get to work with a lot of people throughout this interesting, and sometimes complicated, process, which is by far the best part of my job.

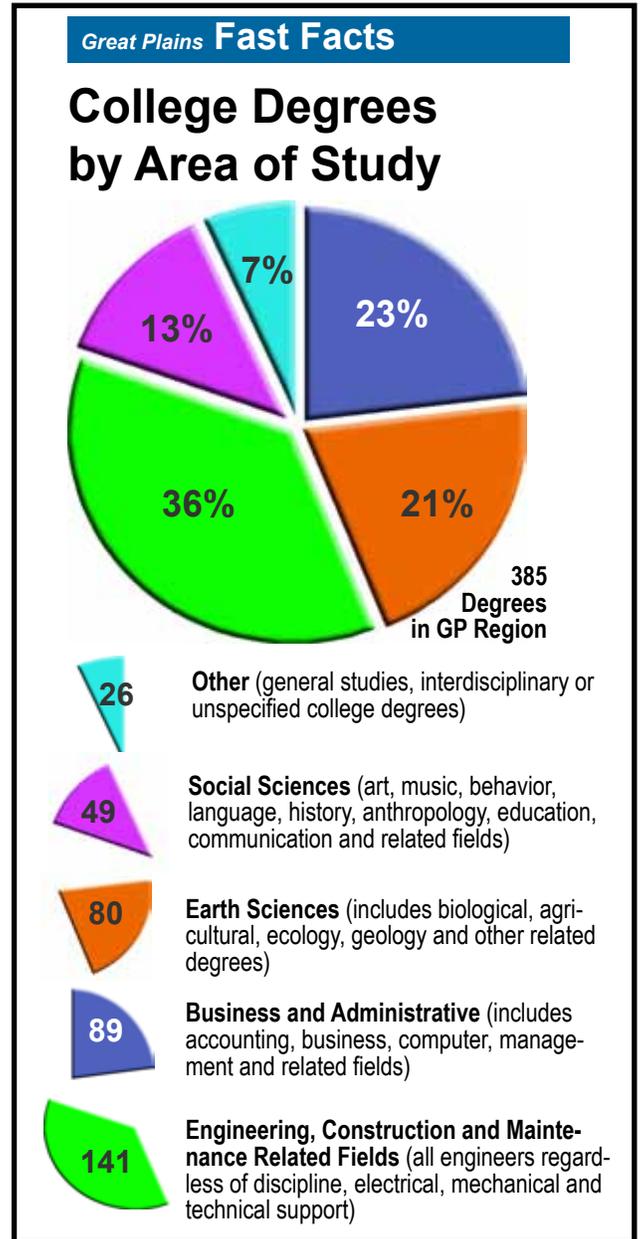
Working with people from various disciplines who often have competing interests in Reclamation’s projects can be challenging, but helping to mitigate project impacts is very gratifying.

Issues often become very sticky and stubborn, and then someone, rarely me, comes up with a brilliant solution.

Competing demand for water is often at the center of the issues – for crops, power, drinking, recreation, and wildlife.

Meeting all of these demands is the challenge. It can mean evaluating improvements on how we deliver water for crops so there is sufficient water left over for boating, or looking for ways to adjust the timing of water diversions to encourage fish reproduction so there is a healthy fishery.

For me, that’s just one of the rewards of being an environmental compliance specialist.



# Ready, Aim, Shoot!

**May - August, 2012**

Visit the GP Intranet page for details and to submit images

## Great Plains Region Photo Contest

# Ready to Respond

## Reclamation Supports Emergency Response Through Incident Command System

By Tyler Johnson, Regional Public Affairs Officer

**(Above) An air tanker draws water from Flatiron Reservoir to help put out a fire west of Loveland, Colo., in 2010.**

Reclamation's role in national preparedness and emergency response goes beyond projects and facilities.

In March 2011, President Obama released Presidential Policy Directive 8, following the response to the Deepwater Horizon oil spill in the Gulf of Mexico in summer 2010.

As directed by the President, our national preparedness is the shared responsibility of all levels of government, private and nonprofit sectors, and individual citizens. Everyone can contribute to safeguarding the nation from harm.

According to the Department of Homeland Security, the directive is aimed at strengthening the security and resilience of the United States through systematic preparation for the threats that pose the greatest risk to the security of the nation, including acts of terrorism, cyber attacks, pandemics and catastrophic natural disasters.

The directive is intended to galvanize action by the federal government, and aimed at facilitating an integrated, all-of-nation, capabilities-based approach to preparedness.

"This past year we were reminded that disasters can

strike at any time and that preparedness is critical," said Secretary of Homeland Security Janet Napolitano while addressing a group at the "Champion of Change" award ceremony.

"We commend the innovative practices and achievements that these individuals bring to the field of emergency management in order to make our communities safer, stronger, and better prepared."

Reclamation's role in national preparedness falls into two categories systematically named Emergency Support Functions. The two support roles specific to Reclamation are civil engineering and public affairs.

Reclamation may be called upon at any time to fill critical roles during any declared disaster.

Mike Ryan, Regional Director for the Great Plains Region, said, "Serving communities and the nation in this manner fits well with Reclamation's tradition. For over a century, Reclamation has brought technical professions to the scene to work with others to solve natural resources challenges."

President Obama called for the national preparedness system to be an integrated set of guidance, programs, and processes that will enable the nation to meet the national preparedness goal.



The national preparedness system is designed to help guide the domestic efforts of all levels of government, private and nonprofit sectors, and the public to build and sustain the capabilities outlined in the national preparedness goal.

The national preparedness system includes guidance for planning, organization, equipment, training, and exercises to build and maintain domestic capabilities.

The national preparedness system includes a series of integrated national planning frameworks, covering prevention, protection, mitigation, response, and recovery. The various frameworks are built upon scalable, flexible, and adaptable coordinating structures to align key roles and responsibilities to deliver the necessary capabilities.

The frameworks are coordinated under a unified system with a common terminology and approach, built around basic plans that support the all-hazards approach to preparedness and functional or incident annexes to describe any unique requirements for particular threats or scenarios.

Each framework describes how actions coordinated with relevant actions described in the other frameworks across the preparedness spectrum.

The national preparedness system includes an inter-agency operational plan to support each national



**(Above) In 2005, following Hurricane Katrina, Reclamation provided disaster relief with an Expeditionary Unit Water Purifier. The EUWP operated 24-hours-a-day on the gulf coast, providing ultrafiltration pretreatment and reverse osmosis desalination, before being transferred to the Biloxi Regional Medical Center in Biloxi, Miss.**



**(Above) Members of the Joint Information Command at the Deepwater Horizon Unified Command, St. Petersburg, Fla., work to keep the public informed of the ongoing response efforts, May 27, 2010. SOURCE: U.S. COAST GUARD.**

planning framework. Each interagency operational plan is expected to include a more detailed concept of operations; description of critical tasks and responsibilities; detailed resource, personnel, and sourcing requirements; and specific provisions for the rapid integration of resources and personnel.

The Department of the Interior is developing department-level operational plans to support the inter-agency operational plans.

Each national planning framework includes guidance to support corresponding planning for state, local, tribal, and territorial governments.

The national preparedness system includes resource guidance, such as arrangements enabling the ability to share personnel.

It provides equipment guidance aimed at nationwide interoperability, and guidance for national training and exercise programs, to facilitate our ability to build and sustain the capabilities defined in the national preparedness goal and evaluate progress toward meeting the goal.

It also uses consistent methodology to measure the operational readiness of national capabilities at the time of assessment, with clear, objective and quantifiable performance measures, against the target capability levels identified in the national preparedness goal.



# *“We Look to the Future, We Look to the Past”*

## **Shifting Population, Climate Change and Other Challenges Face Reclamation in the 21st Century**

Above: Waters from the W.C. Austin Project irrigate a cotton crop on the George Payne farm in Oklahoma. The first delivery of water from Reclamation's W.C. Austin Project began flowing on June 19, 1946, supplementing inadequate rainfall and stabilizing the local economy.

### **By Buck Feist, Deputy Public Affairs Officer**

Water is Reclamation's number one priority.

No single resource is more vital to a flourishing society than water – and no single development illustrates Reclamation's success more than the explosion of thriving farms and cities that blossomed across the western United States during the 20th century.

According to Reclamation historian Christopher J. McCune, “The Reclamation Act [of 1902] arguably proved to be the most important piece of legislation ever devised in the history of the development of the American West.”

In 1962, President John F. Kennedy dedicated the Fryingpan-Arkansas Project, saying that as the nation determines what projects should be developed, “We look to the future and we look to the past.”

When Kennedy delivered his speech in Pueblo, Colo., the state had about 1.75 million inhabitants. As we enter 2012, the population of Colorado has grown to more than 5.1 million, reflecting the overall trend of an American population shifting toward the West.

During the past century, Reclamation supported new centers of wealth and prosperity in the United States by transforming arid landscapes into agricultural and industrial hubs.

But Reclamation's future challenges remain as daunting as ever in the 21st century.

Escalating populations, volatile weather patterns and an increasingly diverse populace vastly increase the complexities of water management. The agency seeks to balance its traditional role of providing water for agriculture, while meeting the demands of growing urban populations.





as extreme weather events, strains the agency’s ability to adjust.

“In some respects, Reclamation is a victim of its own success,” Ryan said. “We have a finite water supply in the West, faced with an array of competing demands. Our goal is to meet increased water needs without adversely impacting existing uses such as agriculture.”

Agriculture was the dominant industry in the West at the time Reclamation was created. Settlement depended upon stable farm economies, and the public strongly supported large-scale development of water projects.

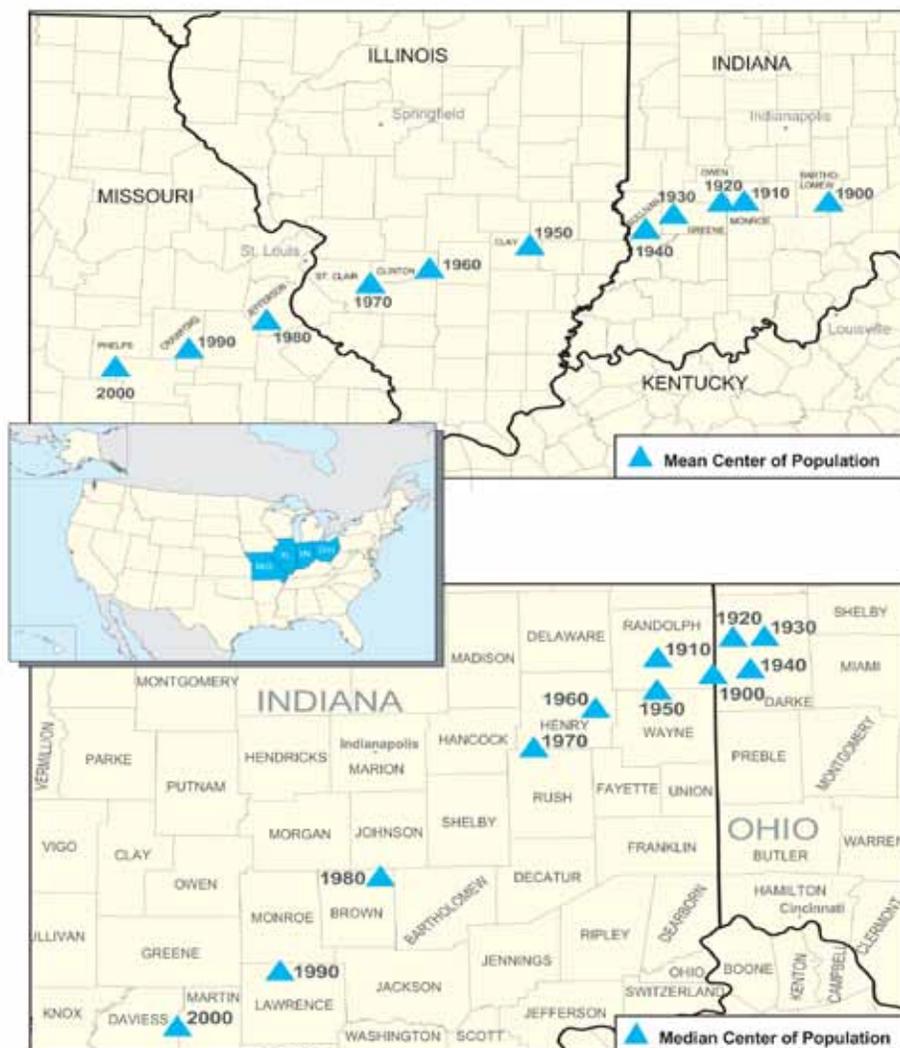
“From our inception, agriculture has been at the core of Reclamation’s mission,” said Ryan. “Food security – the ability to produce enough crops to feed our nation – is a fundamental aspect of national security. In that respect, Reclamation projects are key to both our nation’s security and the well-being of our population.”

A century ago, Congress was composed largely of farmers and others aware of the needs of agriculture. From 1902 to 1907, Reclamation began about 30 projects in Western states, with many located in what is now the Great Plains Region.

These projects included the Buffalo Bill Project on the Shoshone River in Wyoming, the Belle Fourche Project in South Dakota, Huntley Project in Montana, and the North Platte Project in Wyoming and Nebraska.

These early projects were known as “single-purpose” projects,

Mean and Median Centers of Population: 1900 to 2000



(Above) The nation’s center of population moved westward throughout the 20th century, placing increasing demands on scarce water supplies.

because their primary function was to store water for irrigation. Other benefits such as flood control, fish and wildlife habitat, municipal water and hydropower were secondary to irrigation, or were not planned during the construction of these projects.

“Over time, it became clear that Reclamation dams and reservoirs could meet other needs,” Ryan said. “Multipurpose projects were developed to provide for flood control, municipal water and hydropower.”

The heyday of Reclamation’s

construction program began during the Great Depression (1929–1939) and continued through the 1960s.

A significant portion of the Great Plains Region’s multipurpose projects in Colorado began with the Interior Department Appropriation Act of 1937, which authorized construction of facilities on the Colorado-Big Thompson Project, including Green Mountain Dam and Powerplant, Horsetooth Reservoir, and Big Thompson Powerplant.

The Pick-Sloan Missouri River Basin Program, under the Flood



Control Act of 1944, authorized the construction of many of the Great Plains Region's other multipurpose projects in the states of North Dakota, South Dakota, Kansas, Nebraska, Colorado, Montana and Wyoming, including facilities such as the Yellowtail and Canyon Ferry Units in Montana, and the Glendo Unit in Wyoming, which includes Fremont Canyon Powerplant and Gray Reef Dam.

The needs of the West have changed greatly since the early 1900s. Many of the rivers are straining to meet the demands that have evolved over the past century.

Irrigation remains the principal user of water in the West, but rapidly growing cities, tribal needs, recreation interests, and environmental protection are all demanding a share.

"Few new federally funded dams are likely to be built in the near future, due to the high financial costs and environmental and other concerns," said Ryan. "Without the ability to develop new water supplies, our task is to secure water through other means, in particular through better water management."

Reclamation went through a major reorganization between 1988 and 1994, downsizing its workforce and shifting emphasis from the construction of new facilities, to the maintenance and operation of Reclamation's irrigation, water supply and hydropower infrastructure.

In a 1987 report to Secretary of the Interior Donald Hodel, the agency



**(Above) Many temporary towns sprang up as a part of early Reclamation projects, such as Newlon, Mont., near the Lower Yellowstone Project (Photo circa 1909).**

acknowledged its pioneering days were over, writing, "The arid West essentially has been reclaimed. The major rivers have been harnessed and facilities are in place or are being completed to meet the most pressing current water demands and those of the immediate future."

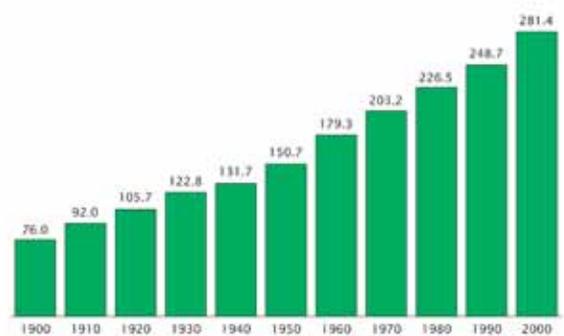
"Our mission continues to evolve," said Ryan. "Reclamation's challenge is to meet our traditional role of providing food security through our irrigation projects, while also planning for the emerging water and power demands from an increasingly metropolitan population."

Reclamation's mission statement, "to manage, develop, and protect water and related resources in an environmentally and economically sound manner," gives

little indication of the complexity and contentiousness that exists in trying to achieve a delicate balance between all the competing needs for a limited supply of water.

As we enter into the second decade of the 21st century, more than 99 percent of the water on earth is unsuitable for people to use. Most of the earth's water supplies are too salty, or located in physically inaccessible places such as icecaps, glaciers, or deep underground.

Figure 1-1.  
**Total Population: 1900 to 2000**  
(Millions)



Source: U.S. Census Bureau, decennial census of population, 1900 to 2000.

**(Above) Reclamation projects play a vital role in meeting the needs of a growing U.S. population.**



“Reclamation manages resources in a very different western water landscape than our predecessors,” said Ryan. “It is incumbent upon us to continue to pioneer innovative approaches to water management.”

For more than a century, Reclamation engineers, hydrologists and support staff have labored to bring civilization to the arid West by building more than 180 water projects, including dams, canals and reservoirs.

During an average water year, Reclamation irrigates more than 10 million acres.

Farmers on Reclamation projects contribute significantly to the total production of food crops in the United States, including 60 percent of the vegetables and 25 percent of the fruit and nuts grown.

Reclamation is the largest wholesaler of water in the nation, and the second largest provider of hydro-power in the West, providing agricultural, municipal, and industrial water to 31 million people.

The history of Reclamation is the history of the West. As Orville and Wilbur Wright made plans for their historic first flight in 1903, Reclamation engineers were conducting surveys and developing plans for crucial infrastructure such as the Milk River Project in Montana and the Belle Fourche Project in South Dakota.

Likewise, in 1962, the year after President Kennedy set the nation on course to place a man on the moon, he dedicated the Fryingpan-Arkansas



**(Above) President John F. Kennedy dedicated Reclamation’s Fryingpan-Arkansas Project in 1962.**

Project in Colorado, saying, “I don’t think there is any more valuable lesson ... than to fly as we have flown today over some of the bleakest land in the United States and then come to a river and see what grows next to it ... and know how vitally important water is.”

Water is Reclamation’s number one priority.

In 2012, the agency continues to fulfill the vision President Kennedy articulated that day in

Colorado, when he said, “I hope that those of us who hold positions of public responsibility in 1962 are as far-seeing about the needs of this country in 1982 and 1992 as those men and women were 30 years ago ... so that by the end of this century, when there are 300 million people in the United States, there will be available to them land and water and light and power and resources, and places to live, and places to rest, and places to work.”



# Wyoming's New Area Manager Focuses on Mission and People

By Buck Feist, Deputy Public Affairs Officer

“My main focus is success of the mission,” said Coleman Smith, Jr., incoming Area Manager for the Wyoming Area Office.

“And everybody has a part to play in that success,” he said.

“A lot of times we put facilities on the front line, and that’s good, because the dams, canals and powerplants are the public face of our agency. But there’s also a tremendous amount of work that goes on behind the scenes – in the cubicles, meeting rooms and offices - and I want folks in Wyoming to feel like these programs are theirs - that they have a personal interest in what we do.”

Smith was selected as Wyoming Area Manager in Feb., and officially took over leadership this April, replacing John Lawson, who retired in Dec. 2011.

“Smith brings a depth of expertise in operations, management and technical advising,” said Great Plains Regional Director Mike Ryan. “His skill set, along with his track record of teamwork, coordination and communication skills, will help the Wyoming Area continue to be a success in the future.”

Smith comes from Boise, Idaho, where he served as the Deputy Manager, Power Operations and Maintenance, for the Pacific Northwest Region. In that position, Smith coordinated work of the regional power office with other federal agencies, including the Bonneville Power Administration and the US Army Corps of Engineers.



Coleman Smith, Jr., Wyoming Area Manager

“Employees need to feel empowered in order for them to take ownership. Every contribution is needed and necessary,” Smith said. “As Area Manager, my job is to make sure our folks have the tools and resources to do their jobs, give them the support they need, and then get out of the way and let them do their jobs.”

Smith is an electrical engineer, and first came to Reclamation in 2007.

He said he looks forward to the opportunities and challenges of the job, and feels fortunate to be working with his new colleagues.

“I’ve been told they are very capable individuals,” he said. “My job is to carry on the legacy left by John Lawson, to make sure we use what he started and did in Wyoming as a benchmark to go forward with.”

Smith said his most important responsibility as Area Manager is the safety of employees and the public.

“I am very committed to safety – safety is job one. I want everyone to come into work everyday, and then go home just the way they came in. Safety is very important to the mission.”

The Wyoming Area Office is headquartered in Mills, Wyo., and includes 12 hydroelectric powerplants, 20 reservoirs, and provides operational control for Colorado’s Big Thompson Project and Montana’s Yellowtail and Canyon Ferry hydropower facilities.

“I’m anxious to get started,” Smith said. “I have a feeling I have a great group of folks to work with.”



# Shooting

Composing images as you take them improves quality and focuses attention on the subject.

Explore five key concepts used to create award winning photographs:

## 1 Depth of Field.

The panoramic view of the Beartooth Plateau near the northeast entrance to Yellowstone National Park serves as the background image. Taken with an infinite depth of field, it renders sharp detail throughout the image above, below and to the right.

The ceramic cowpoke simulates a shallow depth of field where he is in focus but the background at left is not. The result (especially if done to all of the panorama) draws attention to the figure instead of the image as a whole.

1 Spider web in the wind.  
Photo: Jerry Leggate



5 Natural frame over view of Billings, Mont.  
Photo: Jerry Leggate



# for the Best

## Composing Photographs

By Jerry Leggate, Visual Information Specialist, GPRO

### 2 Light Makes a Difference.

The cowpoke illustrates how light alters perception. The larger version in the background used reflected light to eliminate shadows on the figure. The primary source of light came from behind causing distracting shadows under the hat as seen below.



Portraits require attention to light. Portraits without highlights in the eyes appear lifeless.

In general, people are captured best in shade or on a cloudy day rather than bright sunlight and a plus is they will not squint.

### 4 Looking Space Indicates Action.

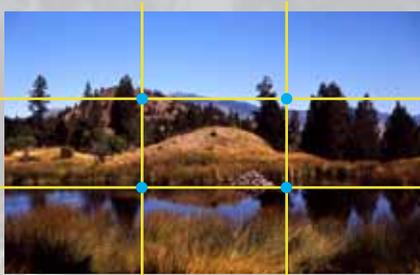
Give the subject of a photo emotion by providing personal space. Even inanimate objects can benefit such as an image of a speeding car with space ahead of it in a race.



Another example is this image of Regional Director Mike Ryan. Even without the added gesture in the larger image, it is more effective than the smaller cropped copy.

### 3 Rule of Thirds.

Images that are pleasing to the eye tend to follow basic spatial concepts. One of these is to divide space horizontally and vertically as shown and arrange major elements within the resulting boundaries (horizontally in this case).



The same principle works diagonally or place subjects at the blue dots for maximum effect (see the cows below for an example also incorporating looking space).

### 5 Perspective for a Fresh Look.

Try altering the point of view or including objects to add variety and create a bond between viewer and the subject. The cowpoke was shot from waist level to emphasize his face and stance.



Pets and small objects also benefit from a view using their perspective instead of the way we usually see them.

3 National Archives photo of Hoover Dam by Ansel Adams.

4 Photo: Tyler Johnson

1 Soft focus frame for attention. Photo: Jerry Leggate

2 Backlit clouds and rainbow. National Park Service image.

3 Plains Talk cover photo.

5 Firefighting at ECAO. Photo: Joe Rohde.



# Access for Everyone

By Tobias Taylor, Visual Information Specialist, GPRO



“The power of [electronic communication] is in its universality. Access by everyone regardless of disability is an essential aspect,” said Tim Berners-Lee, Director of the World Wide Web Consortium.

Electronic mediums such as e-mail, word processing documents and PDF files provide a large part of the communication and information sharing in the Great Plains Region. By following federal guidelines to create documents that are easy for all to use, we ensure that everyone will be able to utilize all of our electronic communications.

## Why make documents accessible?

Approximately 12 percent of Americans have a disability and by making electronic documents accessible, everyone can access and utilize those documents, regardless of ability.

People no longer view electronic documents solely on desktop computers, but now use cell phones, net books, Internet-capable televisions and many other devices. Properly designed accessible documents display more easily on various devices.

By law, all electronic documents produced by federal employees must meet the requirements of Section 508 of the Rehabilitation Act of 1973, as amended in 1998.



Microsoft© Word 2007 Styles Menu

## What steps can I take to create accessible documents?

Proper document structure helps ensure that information is understood and works well with assistive technology. Use the built-in word processor software formatting styles to indicate headings, emphasized text and other document structure elements. These styles create landmarks within the document that sighted users and those who use assistive technology can easily follow.



A page of text laid out with headings differentiated only by visual formatting (bold, center, increased font size, etc.) is interpreted by a screen reader as a single continuous block of text.

Set the natural language for each document to ensure assistive technologies use proper pronunciation when translating the text into speech. If a different natural language is used for a paragraph or section of the document, change the natural language for that section.

Turn off any hyphenation features in your word processing software. Assistive technology devices interpret each part of hyphenated words individually instead of speaking them properly as single words.

All images (photos, clip art, charts, and other graphical elements) used within an electronic document need to include alternative (alt) text. Alt text describes an image and serves to convey the same essential information to those with visual impairments or those who choose not to view images.

Ensure sufficient contrast exists between text and background colors. Low contrast can result in the text



disappearing into the background, making a document illegible. For the best contrast between text and background use single, solid colors and avoid using patterns.

Use color to enhance information, not as the only means to convey that information. For example, if a



form has required fields, making the text red might not be a big enough distinction for a color blind person. Add another visual cue, such as an asterisk or other element to indicate that the field is required.

### I use hyperlinks in my document, how do I make them accessible?

Use clear and concise language for all links. Linked text should inform the reader exactly where the link will take them when clicked (e.g., [Great Plains Region Web site](#)). If providing the URL, have it follow the linked text (e.g. [Great Plains Region Web site, http://www.usbr.gov/gp/](#)). Screen readers interpret links that span two lines of text as two separate links, so format all links to fit on one line.

### What are the accessibility requirements for tables?

Tables are meant to display tabular information, so avoid using tables to create visual layout. Construct tables that read logically from left to right, top to bottom and include concise column and row headers.

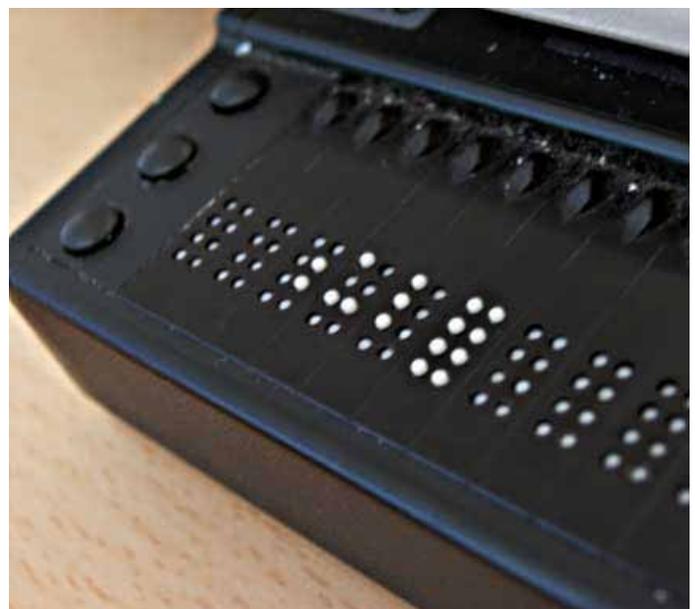
Org. Code	Name	Phone Number
GP-1000	Jane Smith	406-247-1234
GP-1240	Thomas Jones	406-247-9876
GP-2600	Charles Wit	970-962-1123
GP-4000	Susan Berry	406-247-7618

Simple data table created in Microsoft Word.

Tables with spanned cells prove difficult for assistive technology to interpret correctly. Keep table structure simple for the best accessibility for all users. If a complex tables must be used, include a description or explanation of the table’s contents in the text of the document.

Remove text wrapping from around tables. When text wraps a data table the likelihood of reading errors increases as the assistive technology switches from Table Reading mode to Text Reading mode multiple times depending on the amount of text surrounding the table.

“Accessibility is not only for people with disabilities but for all of us who are thankful that there are no barriers in using our abilities,” said Remberto Esposa Jr., Guild of Accessible Web Designers.



A Refreshable Braille Display, an example of assistive technology, connects to a computer by a serial or USB cable and produces braille output for the user.



# Reclamation Hydropower Generates \$1 Billion for Taxpayers

(Above) U.S. lights at night from space. SOURCE: NASA.

**By Jay Dallman, Natural  
Resource Specialist, WYAO**

Hydroelectric power production and distribution has played an important role in the history of America and in the economic viability of the Bureau of Reclamation.

The term “hydropower” does not necessarily refer to hydroelectric power. The concept of using flowing or falling water to power machinery has been embraced by civilization for thousands of years. Hydroelectric power is a more recent development. At the Bureau of Reclamation, however, we use the term “hydropower” in reference to hydroelectric power.

Hydroelectric power is electricity produced from generators driven by water turbines that convert the energy in falling or fast-flowing water to mechanical energy.

Water at higher elevations flows downward through large pipes or tunnels, which Reclamation refers to as penstocks. The falling water rotates the turbines, which drive the generators, which convert the turbines’ mechanical energy into electricity. The advantages of hydroelectric power over such other sources as fossil fuels and nuclear fission are that it is one of the most efficient means of energy conversion. Hydroelectric power is con-



Transmission lines.

tinually renewable, and it produces almost no pollution.

Hydroelectric power is clean energy. Its production does not contribute to air pollution, atmospheric carbon-dioxide (CO<sub>2</sub>), or thermal pollution. Reclamation was among the early pioneers in developing green energy in the form of hydroelectricity.

A 2006 report by the International Rivers Network claims that water storage reservoirs release a significant amount of CO<sub>2</sub> and methane (CH<sub>4</sub>) into the atmosphere as a result of decomposing vegetation within the footprint of the reservoir.

According to a 2011 article by Nature Geoscience, the amount of greenhouse gases contributed by reservoirs may not be so significant. “The contribution from hydroelectric reservoirs ...is mi-



nor when considering the global warming potential of CO<sub>2</sub> and CH<sub>4</sub>. Carbon emissions by hydroelectric reservoirs are also small in comparison to the total emissions reported for natural inland waters.”

Even where CO<sub>2</sub> emissions from reservoirs can be identified, in most cases, this effect could not be attributed to hydropower production. Most of Reclamation reservoirs were built for irrigation, water storage or for multiple uses, meaning the reservoirs and their associated impacts would exist whether or not hydropower was produced. The amount of CO<sub>2</sub> and methane released is much lower in arid climates where reservoir floor vegetation is minimal. Many of Reclamation’s reservoirs, such as Lake Mead, Bighorn Lake and Flaming Gorge Reservoir, fall in this category. Wherever vegetation is present, some natural decom-

position of plant material and the associated release of greenhouse gases will be occurring, whether a reservoir is constructed or not.

As vegetation grows, it seques-



ters CO<sub>2</sub>. Then, when plants die and decompose, CO<sub>2</sub> gas is released directly to the atmosphere or diffused (sequestered) for a time in oceans, lakes, reservoirs, or even in the soil. The plants may be converted into fossil fuel, in which case the greenhouse gas may remain sequestered for millions of years or longer. Sequestered CO<sub>2</sub>

will ultimately be released to the atmosphere again, and the cycle continues.

“It would take more than 23.5 million barrels of crude oil or about 6.8 million tons of coal to produce the energy equivalent of Reclamation’s 58 hydropower plants,” said Commissioner Mike Connor during his Fiscal Year 2013 Budget Justification. “As a result, Reclamation’s facilities eliminate the production of over 27 million tons of carbon dioxide annually that would have been produced by fossil fuel power plants. Hydropower production not only conserves our precious natural resources, but it also helps reduce the amount of atmospheric pollution.”

Reclamation’s first hydroelectric powerplant was built in association with the Theodore Roosevelt Dam on the Salt River about 75 miles northeast of Phoenix, Ariz.

### Some Key Developments Related to Early Hydroelectric Power Production

1879	Cleveland Ohio – First commercial arc lighting system installed
1880	Grand Rapids, Michigan – brush arc lighting used in chair factory
1881	Niagara Falls – Brush dynamo connected to turbine powers street lights
1882	Appleton, Wisconsin – First commercial hydroelectric station began operation
1886	Frank Sprague built first American transformer and demonstrates step-up and step-down voltage
1886	40 to 50 hydroelectric plants reported on-line or under construction in the U.S. and Canada
1887	San Bernardino, California – First hydroelectric plant constructed in western U.S.
1888	Rotating field Alternating Current (AC) alternator invented
1889	Oregon City, Oregon – First AC hydroelectric plant built
1889	200 electric companies in U.S. reported using water power for some or all of their generation
1891	Frankfurt, Germany – First 3-Phase hydroelectric plant began operation
1891	60 cycle AC system was introduced in the U.S.
1893	Austin, Texas – Austin Dam was completed. It was the first dam constructed specifically for hydroelectric power production
1893	San Antonio Creek, California - First use of step-up and step-down transformers in a hydroelectric plant
1893	Mill Creek, California – First American 3-Phase hydroelectric plant
1902	Bureau of Reclamation created (U.S. Reclamation Service)
1911	Construction complete on Reclamation’s first hydroelectric plant – Roosevelt Dam, AZ
1922	First hydroelectric plant built specifically for peaking power
1940	Over 1500 hydroelectric facilities produce roughly one third of the total electric power requirement of the U.S.





Denver skyline around midnight from I-25 and Speer Blvd. SOURCE: WIKIMEDIA COMMONS, MATT WRIGHT.

In 1906, small temporary hydroelectric generators, installed prior to construction, provided energy for construction related machinery and equipment. Surplus electricity from those generators was sold to nearby communities. A powerhouse containing a permanent 900 kilowatt (kW) unit was constructed at the base of the dam in 1907. Four more generating units later came on line and by September 30, 1909, five generators with a combined capacity of 4,500 kW were in operation, supplying power for

pumping irrigation water, and furnishing electricity to the Phoenix area. The plant was completed in 1911 and later updated to about 36 megawatts (MW).

The demand for electrical power in America has skyrocketed since 1940, and even though the hydropower production has increased significantly since then, the overall percentage of total electrical demand satisfied by hydro facilities has fallen to somewhere in the range of 7-10 percent.

Hydroelectric power provides

the fourth largest component of available electric supply in the U.S., and is the largest form of renewable energy in the world.

The U.S. is the world's fourth largest producer of hydroelectric power, after China, Canada, and Brazil, and Reclamation is the second largest producer of hydroelectricity in the U.S.

Reclamation's largest hydro plant is Grand Coulee powerplant in Washington State. It has a rated capacity of 6,400 MW.

Reclamation uses some of the power it produces to run its facilities, such as pumping plants. Excess hydropower is sold first to preference customers, such as rural electric power co-ops, public utility districts, municipalities, tribes, and state and federal agencies. Remaining power may be sold to private electric utilities. Power is sold at a cost-based rate which, in Reclamation's case, means an average rate sufficient to cover the cost of production, repayment of the capital investment in the infrastructure, distribution and related expenses, without producing a profit.

Although Reclamation sells power to its irrigation and preference customers at a cost-based rate, the value of the electricity produced varies. Power produced



Roosevelt Dam and Powerplant, Salt River Project, Ariz., print of a 4x5 inch original historic photo of Reclamation's first hydroelectric plant.



at periods of peak demand has a higher value. Many of Reclamation's powerplants are operated to provide peaking power as at least a portion of their output. The reason peaking power has a higher value is due to the nature of large base-load type powerplants. These are typically powered by coal, gas or nuclear reactors which heat water to produce steam which drives turbines to produce electricity. Many of these plants simply can't react quickly to fluctuations in demand.

According to Kerry McCalman, Reclamation's Senior Hydropower advisor, "It's a significant benefit to Reclamation's power customers to receive cost-based power during peak demand times so they don't need to purchase higher cost peak power on the open market. An additional benefit is gained when there is peak power from Reclamation's plants that is excess to our customers' needs, which can be sold by Reclamation at peak market prices."

Differences in peak and off-peak power value are also what make pumping plants viable. Reclamation's pumping plants are net revenue generators because water is pumped to higher elevations during off-peak hours when the value of the electricity is lower, and then released back down through the turbines during times of high demand when power prices are higher.

Wyoming Area Office Operation and Maintenance Chief Bill Dykes explained, "In addition to being able to provide cost-based power to our preference customers, Reclamation also earns revenue under contracts for the value of having electricity available when needed. The agencies and utilities that pur-

chase power from Reclamation pay a premium for the availability of reserve capacity, whether they actually end up using it or not."

Hydropower was not an originally authorized purpose in many early Reclamation projects, it has been added in many cases through reauthorizations and now is the primary revenue generator for the agency. Reclamation has 58 hydropower plants, 53 of which are operated and maintained by Reclamation. On an annual basis, these plants produce an average of 40 million MW-hours of electricity, enough power to meet the needs of 3.5 million households, and power revenues exceed \$900 million. These revenues cover the full cost of power generation and transmission, and also provide aid-

to-irrigation dollars which help pay for irrigation infrastructure that supports irrigated agriculture in the West. Hydropower revenues also help pay the cost of Reclamation's environmental mitigation and commitments.

The value of hydropower to Reclamation and to the U.S. far exceeds the mere revenue generated by the sale of hydroelectric power. From providing inexpensive electricity, to reducing atmospheric pollution, to stimulating American agriculture and industry, and providing or helping to support tens of thousands of jobs, hydropower has been a significant contributor to the success of Reclamation and the prosperity of America.



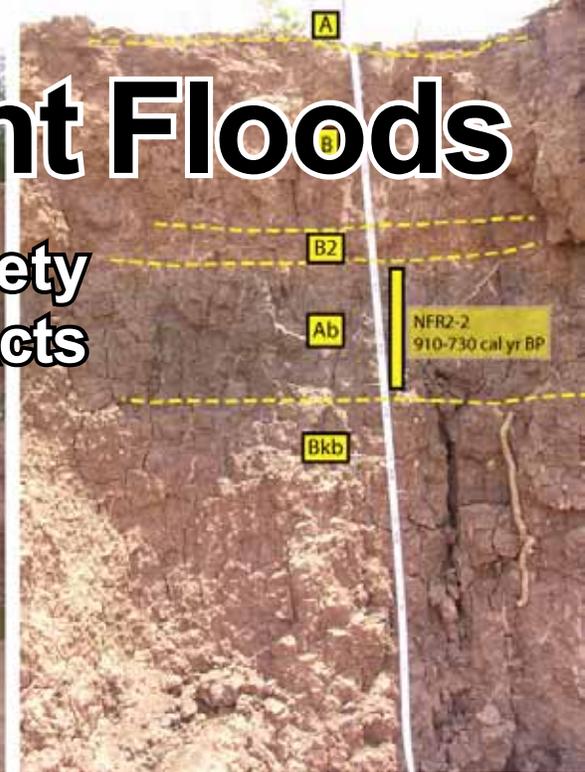
**Grand Coulee Dam and Powerplant, Columbia Basin Project, Wash., Reclamation's largest power facility with a 6,400 MW capacity.**



# Exploring Ancient Floods

## Reclamation Boosts Dam Safety Program By Examining the Impacts of Ancient Floods

By Kim Parish, Administrative Officer, OTAO



(Left) The soil profile of the river bank at a paleoflood study site near Altus, Okla. (Right) The upper soil (A through B2 horizons) shows sediment deposited by a major flood event that occurred within the last 730 to 910 years.

Altus Dam, which is a principle feature of the W.C. Austin Project, was constructed in the 1940s and is currently undergoing a Corrective Action Study as part of the Dam Safety Program to mitigate overtopping concerns during rare extreme floods.

As part of this study, a team of experts from Reclamation's Technical Services Center are conducting a paleoflood study to investigate the largest floods that have occurred prehistorically in the watershed.

Stream terraces along a river preserve a geologic record of floods that can be used to develop paleoflood information.

The age of the flood deposit in the stream terrace is estimated using radiocarbon dating, in which charcoal is collected from the flood deposits, identified and dated using Accelerator Mass Spectrometry (AMS) and the principles of

radioactive decay. The discharge associated with the flood deposit is estimated using a hydraulic modeling program. The paleoflood data provide long-term data to complement the short-term stream gauge



(Above) View from Altus Dam showing the north fork of Red River.

data and typically reduce the uncertainty in estimating the magnitude and frequency of rare extreme floods.

At Altus Dam, sites both downstream of the dam and upstream of the reservoir were investigated for use in estimating the frequency and magnitude of extreme floods along the North Fork Red River. OTAO

staff coordinated with local landowners to gain access to the sites. Charcoal samples were collected from the flood deposits and submitted for radiocarbon analysis.

Together with additional topographic information which was recently collected using LIDAR (Light Detection and Ranging) technology, a two-dimensional hydraulic model will simulate the stage and discharge required to inundate the stream terraces where the flood deposits are preserved.

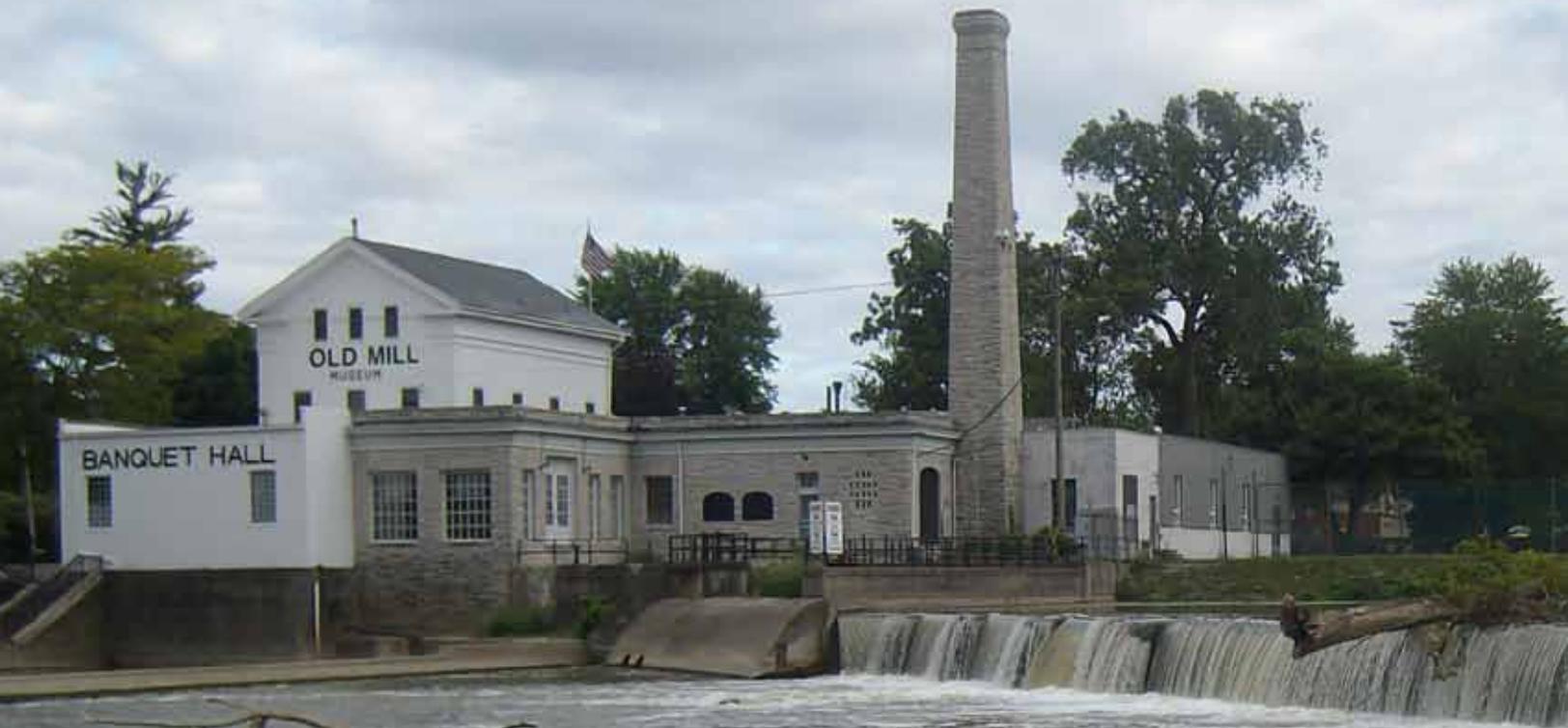
The model results will then be used to update the flood frequencies for the reservoir.”

Reclamation will use the updated flood frequencies to guide in development and selection of risk reduction alternatives for Altus Dam. A few alternatives that are currently being considered include construction of an auxiliary spillway or expansion of the existing spillway.



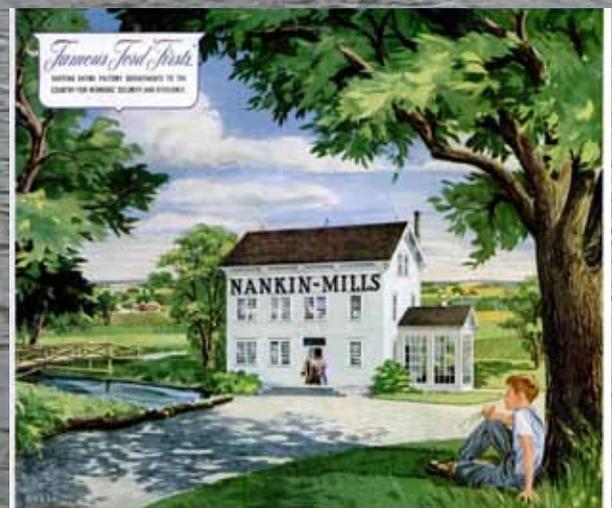
# Hydropower in History

*A page from the history books showing the critical role hydropower has played in the development of the American West.*



Henry Ford is known for mass producing automobiles bearing his name, but he also took a keen interest in hydropower development. In the 1920s, just as Reclamation was building hydropower for the American West, Ford was already using it to transform his industries.

Main photo: Old Mill in Dundee, Mich., that began as a grist mill in 1849. In 1910, it was converted to provide hydropower to the village and later renovated by Henry Ford in the 1930s to manufacture welding supplies as part of his Village Industries. Today the facility serves as a museum.



**1<sup>st</sup>**  
to demonstrate true decentralization

**EXPECT THE "FIRSTS" FROM FORD!**

*Ford*

At waterpower sites in Michigan, along the Huron, St. Ignace and St. Ignace rivers, you are shown — 28 "Village Industries" established by Ford. They work nearly 5000 men and women who have the peace and security of having "one fact on the mill... and one in industry." Many live on their own little worlds. They own good, comfortable homes from their employers. These busy little industries, since 1911, have been setting an example of true decentralization. They are not "branches." They do not duplicate the work of main plants. They are complete production departments which do specific jobs from start to finish. Each year decentralization, made possible by methods developed in big city shops, spreads its benefits widely. It distributes production power. It assures fair production workmanship on small items like gears, levers, and castings. And it eliminates present waste. Mr. Ford realizes the time when industry will be made up of "a lot of little centers." And by giving the economic production of this type of decentralization, he has established another in the long line of Ford "firsts." In the days ahead, when maximum production is essential, Ford, America will continue to profit by such forward-looking thinking and planning, and doing.

1928 FORD MOTOR CORPORATION, DETROIT, MICHIGAN

# Camera 101: Get the Best

## THINK

Consider how images might be used. Taking several from different angles and fields of view provides options when placing them in documents. It is easier to delete unneeded images than to get new ones later. Note the image of new houses on the front range in Colorado (behind **THINK** at the bottom of this page) would not work without the expansive grassy view in the foreground.



The image above shows a GP drill crew at Huntley, Mont., earlier this year. The middle image shows a similar view suitable for a report cover. The image at right tells more of the story by showing the structure to be replaced (the reason for the crew to be there).



## PLAN

Most cameras have several choices of mode for creating better images. The water images behind **PLAN** and **&** below are good examples. In the water and rocks image, the action is frozen by a high shutter speed and individual droplets can be seen. The waterfall motion is blurred by increasing the exposure time to 1/30 of a second.

Some of the most common modes are:

- A Automatic** - a safe setting for most Reclamation images.
-  **Sports** - forces high shutter speed and exposure sensitivity to stop action with limited blurring.
-  **Backlit** - overrides auto-exposure so subject is rendered well and may fire flash for fill light.
-  **Closeup** - adjusts camera to macro mode.
-  **Landscape** - for wide scenic views and low light.



In portraits, plan to avoid background conflicts such as the antelope antlers appearing on our cowpoke model. Doors or windows, artwork and corners are some indoor conflicts. Trees, buildings, signs and other people are common outdoors.

## STEADY

The most common error when taking images is camera shake. Involuntary tilting of the camera blurs the entire scene. This is most apparent when

zoomed in on a subject such as the telephoto image of the squirrel behind **STEADY** below. Brace against a solid object or use a tripod!

### Camera Sensitivities

When in doubt use a higher sensitivity in camera settings. Typically 400, 800 or 1600 offers more flexibility in capturing scenes.





# Photo Q & A:

## Why do photos look fuzzy or blurred when in documents?

Pixels Have It



Successive enlargement of an image reveals individual pixels and their relationship to the quality of the printed photo. The original photo at left is 850 pixels wide and the one at right is nine.

### The Right Resolution for the Job

If the original image was in focus, then most likely there is not enough information to render it well. Cropping or gross enlargement of the image is the likely cause.

Digital images are like a wall of colored building blocks forming a mosaic. Each block behaves like a specific element within an image. These picture elements are called pixels.

Images vary in both the number of pixels they contain as well as the magnification at which the available pixels are displayed. Crop or enlarge the image too much and fewer pixels are available for good results.

Conversely, pixels exceeding the display (or printer) resolution contain more information than can be used and waste resources. See the images of the killdeer at right.

#### Typical pixel resolutions per inch for acceptable results

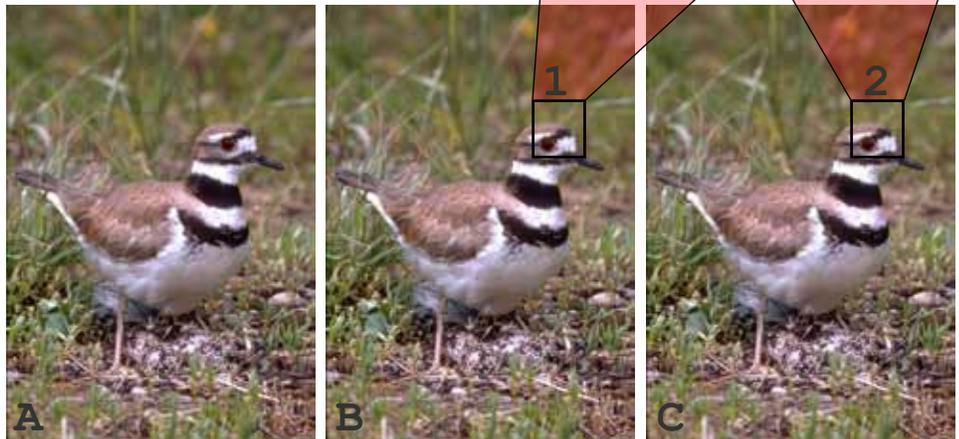
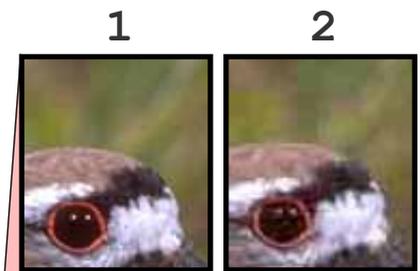
Internet images	72
Monitor displays	92
Laserjet and plain paper	120
Photo inkjet and paper	150 and up
Printing (four color press)	300
PowerPoint (total image width)	1800

### The Other Villain: Lossey Compression

Not all pixel information is preserved consistently as images are manipulated. To save storage space and speed transfer, images are often compressed. JPG compression is called lossey because after repeated use (or too severe a setting) the image is degraded as shown in enlargement number 2 below. Compare to enlargement 1 from a JPG properly compressed.

Enlargement 2 still has the same number of pixels but blocky clusters of similar colors were created eliminating data used to describe pixels individually. This makes JPG files much smaller than other file types for use in email, on the Internet or where storage space is limited.

JPG compression used correctly has distinct advantages. Reclamation digital images are typically modestly compressed JPGs and the camera original files are preserved without additional editing or compression. Only copies should be used in documents.



This is the equivalent of an 11 megapixel camera image and uses 33,314,520 bytes of computer space. It has a total of 11,096,400 pixels (the equivalent of 1600 per inch).

This copy of the killdeer was reduced to 390,075 pixels (300 per inch) and matches the printing quality of *Plains Talk*. It uses less than one tenth the resources of image A.

The same number of pixels as B have been severely compressed in a JPG. The image file is only 50,000 bytes, but detail and color have been lost (see insets).





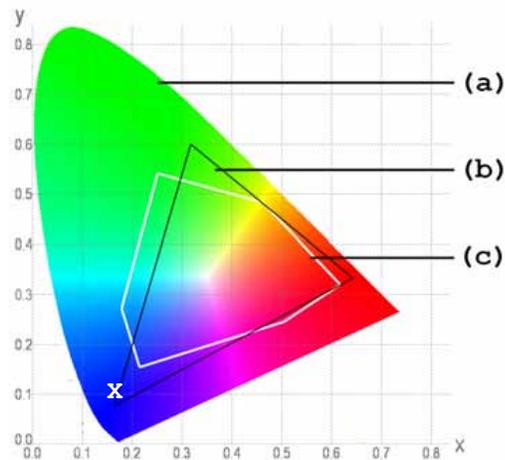
## Photo

### Q & A:

It's the Gamut

## Why don't colors print the same as I see them on a monitor?

Gamut is a term commonly used to describe a range of color and the capabilities of color devices. The full gamut of color is often simplified as a horseshoe shaped graph of all the frequencies of color that the human eye can see. Within that are smaller areas of color that are able to be displayed or reproduced by devices.



Graphic representation of color gamuts.

- (a) is the entire visible palette
- (b) is the RGB gamut of a typical computer monitor
- (c) is the CMYK gamut of a typical inkjet printer

Monitors, printers and cameras also need to be calibrated to match colors accurately between them.

Computer monitors cannot render all the colors the human eye can see. This issue becomes important when images are manipulated, changed, displayed or printed. For example, the blue shown at the X on the graph at right is visible on a monitor, but will shift to a different tone and gamut when printed.

Note that about half the visible spectrum is composed of shades of green. Because of this, human eyes and digital camera sensors sample twice as much green as red or blue.

A device included in an image to facilitate color calibration.



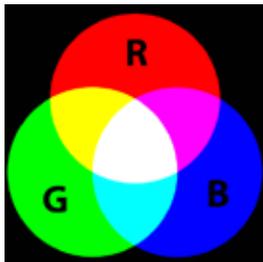
## Photo

### Q & A:

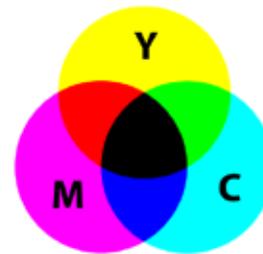
Add or Subtract

## RGB and CMYK - What is the Difference?

A spotlight for each color creates new overlapping hues and white for all three.



Cyan, magenta and yellow inks are mixed on the printed page.



Photography is often technically defined as *recording light* and artistically as *painting with light*. To do so in the digital age relies upon the primary colors of red, green and blue (RGB) and the additive properties of color.

The visible spectrum of light is a range of wavelengths associated with specific colors. Refraction of light (such as in a rainbow) reveals all the possible colors (wavelengths) it contains. White is perceived when all colors of light are present. In contrast, true black is the absence of all color (light). Mixing varying amounts of the three RGB primaries creates all other colors. Cameras, monitors and televisions create images using this principle.

Subtractive color is used by color printing presses to make newspapers, magazines and books. Cyan, magenta and yellow inks are mixed over a white background (paper). No ink is white (it reflects all light colors) and 100% of all three inks subtracts all colors and is perceived as black. The full color spectrum is possible by mixing the three inks to absorb all but the desired color.

Black (K) was originally added to create CMYK as a way of printing pages containing only text. Mixing all four inks also simplified rendering a wider range of colors. Computer printers and artists use subtractive color.

Both color principles are used in digital imaging. Additive (RGB) in capturing or viewing and subtractive (CMYK) in printing.



# Canyon Ferry Gets Face Lift

By Paula Holwegner, Administrative Officer, MTAO



**(Above) Coir logs (coconut fiber rolls) are used to stabilize shoreline sites. The rolls accumulate sediment and then biodegrade as plants become established. (Right) An example of a gabion wall on Canyon Ferry Reservoir with flanking erosion due to deflecting wave energy.**



The picturesque views of Canyon Ferry Reservoir, surrounded by mountains, forest, and grassland, make Canyon Ferry a popular recreation destination for activities ranging from fishing and boating, to hunting and wildlife viewing.

On the north end of the reservoir, the Canyon Ferry Act allowed 265 former cabin site lessees to purchase the land, transferring leases to private ownership, while maintaining public ownership of the adjacent shoreline.

The Act required public access to and along the shoreline remain unobstructed and maintained.

Administration of public shoreline near private cabin sites and increased visitation presented some unique situations, and loss of shoreline due to erosion was a concern.

In response, from 2003 to 2008, Canyon Ferry in partnership with interested parties, developed the Canyon Ferry Shoreline

Management Plan. The Plan provides balanced, practical, and relevant guidance for addressing public use, adjacent landowner concerns, and resource protection on the shoreline of Canyon Ferry Reservoir.

Some of the erosion control measures addressed in the Plan include (1) Relocation of Threatened Structures or Roadways, (2) Non-Structural Stabilization, (3) Dynamic Revetment, (4) Bio-Engineering Stone, (5) Rip-Rap Revetment, and (6) No action.

The Bureau of Reclamation has identified six sites along the shoreline of Canyon Ferry Reservoir with moderate to severe erosion issues. Reclamation intends to adopt sustainable shoreline protection practices to stabilize these six sites. Reclamation has developed a design, construction plans and specifications for effective shoreline stabilization and restoration solutions

and techniques in sensitive cultural and natural resource areas. These methods are visually, environmentally and ecologically compatible with other resources. This project includes state of the art bioengineered stabilization methods and artificial structures that emulate naturally-occurring shoreline structures in order to protect infrastructure and prevent further erosion.

“This project will utilize several of the stabilization methods recommended in the Draft Shoreline Management Plan,” said Shawn Bryant, Assistant Facility Manager. “Design for this project is complete, and Reclamation hopes to award a construction contract in the near future to stabilize these high-priority sites,” he said.

The Draft Shoreline Management Plan can be accessed at: [www.usbr.gov/gp/mtao/canyonferry/smp\\_rev\\_06\\_2010.pdf](http://www.usbr.gov/gp/mtao/canyonferry/smp_rev_06_2010.pdf).



# GP Region “Best in Federal Government”



Melissa Chastain, Regional Records Manager, developed a control system to flag and record incoming/outgoing environmental correspondence and documents.

## By Tobias Taylor, Visual Information Specialist, GPRO

“It was a long four-year process resulting in many hours and a lot of collaboration by the Core Team. I couldn’t be more proud of all the work we did. It just goes to show what we can accomplish when we all work together for a common purpose,” said Regional Environmental Management System (EMS) Coordinator Stefanie Jordan.

The Great Plains Region underwent its third-party EMS conformance audit the week of October 24, to ensure the region is implementing

EMS in accordance with Department and Bureau requirements, and to identify areas that need improvement.

When the results were in, GP ended up with the best EMS audit in all of government – and one of the best in private industry!

“Congratulations on being one of the two USBR Region Environmental Management Systems immediately ready to declare that EMS is in conformance with the requirements, and the only region to complete the audit with zero nonconformities,” said Tony Westbrook, Osage Virginia, Inc. Lead Auditor, in a letter to Great Plains Regional Director Mike Ryan.

EMS is a systematic approach for managing environmental issues, providing a continual cycle of planning, implementing, reviewing, and improving the processes and actions that the Great Plains Region undertakes to meet its business and environmental goals.

The results of the audit show that GP takes a proactive approach to environmental stewardship with an emphasis on continual improvement that facilitates the integration of environmental accountability into the day-to-day operations and long term business decisions of the region.



The auditors were very impressed with GP’s implementation of EMS and highlighted strategies that set the region apart from other government and private organizations.

The region was commended for incorporating environmental considerations seamlessly into day-to-day activities. EMS Coordinator Stefanie Jordan provides frequent updates on environmental and EMS activities to employees and management through weekly conference calls, quarterly EMS reviews, and Regional Leadership Board meetings.

Jordan also implemented a “go green” e-mail address to provide suggestions and generate communication related to environmental issues. Desk cards were distributed, summarizing Reclamation’s environmental stewardship policy and significant aspects of the region. The desk cards were so successful auditors found them



**The EMS team distributed desk cards to ensure personnel were fully briefed on Reclamation’s Environmental Management Policy.**

**Reclamation Environmental Management Policy**

Comply with all applicable environmental laws, regulations, and Reclamation requirements.

Reduce environmental impacts through pollution prevention, waste reduction, and sustainable practices within the framework of EMS.

**Great Plains Region Long-term goals include:**

- 💧 Reducing toxic and hazardous chemicals and materials acquired, used, or disposed;
- 💧 Improving energy efficiency and reducing greenhouse gas emissions by 3% annually;
- 💧 Reducing water consumption intensity by 2% annually;
- 💧 Reducing our fleet’s total consumption of petroleum by 2% annually;
- 💧 Increasing use of bio-based, environmentally preferable energy-efficient, water-efficient, and recycled-content products.

<http://intra.gp.usbr.gov/ems>

on desks, bulletin boards, and break room tables.

Amanda Somerville designed a Green Purchasing Database that tracks credit card purchases for green products. Somerville will share her database with other regions.

Gene Schwartz, Regional Property Manager, created a process to gather

information on Fleet activity that he will share with other regions.

Melissa Chastain, Regional Records Manager, developed a Central Records Control system to flag and record incoming/outgoing environmental correspondence and documents effectively. A tested and verified con-

trols system to identify missing documents and maintain records that are easily accessible impressed the audit team.

The Wyoming Area Office created an internal method to track required EMS awareness training by having new employees take the training immediately upon being hired rather than wait until the training can be assigned in the DOI Learn system.

Laura Schweiger, Hazmat and EMS Coordinator for WYAO, developed a best business practice of holding back 50 percent of the funds for hazardous waste disposal contracts until documentation is received verifying the proper disposal of the hazardous waste.

Regional Director Mike Ryan declared EMS conformance to the Office of Policy on December 15, 2011. The next EMS external audit is scheduled for 2015.



**Amanda Somerville, Regional Purchasing Agent, with her Green Purchasing Database.**



# Reclamation Takes the Fight to Mussels

By Kim Parish, Administrative Officer, OTA0

As the spread of quagga and zebra mussels continues in the Western United States, the early detection of the organisms has become increasingly important to minimize their impact on Reclamation's water and hydropower infrastructure.

The freshwater quagga and zebra mussels are natives of Eurasia and were first transported to North America in the late 1980s. Since their introduction, they have spread quickly throughout the eastern United States, most notably in the Great Lakes, and finally moved to the lower Colorado River in 2007. The mussels have the potential to impact Reclamation infrastructure and the operation of its water delivery and hydroelectric power systems; additionally, the mussels'



A clump of invasive zebra mussels. SOURCE: USFWS.

presence disrupts the native diversity of infested water bodies.

Under the American Recovery and Reinvestment Act, Reclamation's Technical Service Center (TSC) launched a program to sample and analyze western waters for the presence of these invasive mussels. The program provides employment

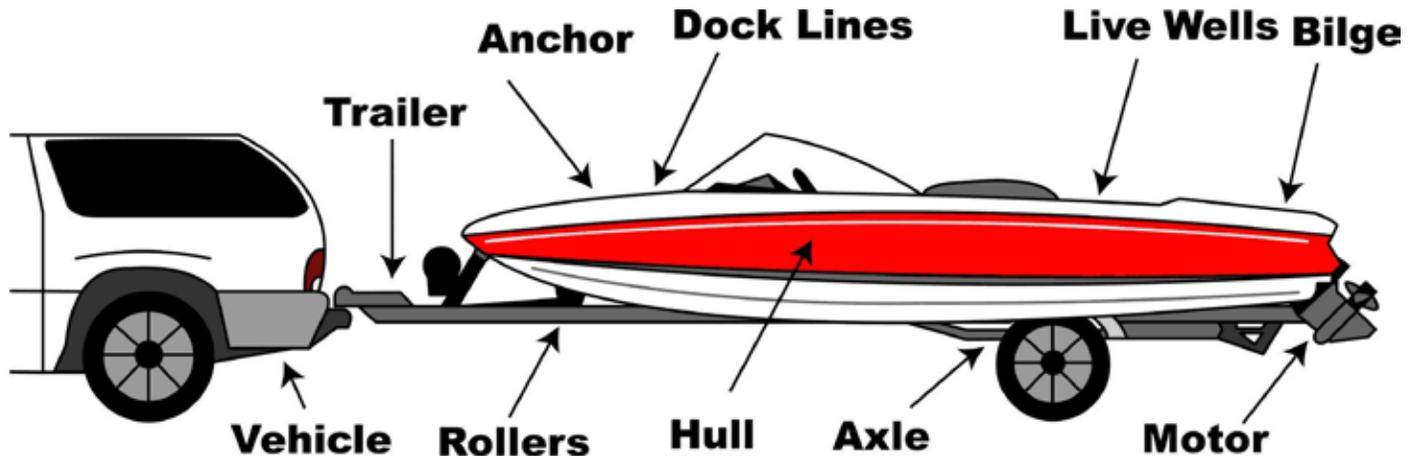
through a private contractor for young people that are currently enrolled or have recently graduated from college in an effort to integrate them into the workforce.

The Oklahoma-Texas Area Office (OTA0) has partnered with TSC to sample four reservoirs in Oklahoma. Reclamation began sampling these four reservoirs in 2009, and then turned the sampling over to TSC's contractor for the 2010 and 2011 sampling seasons. To date, samples pulled from the four reservoirs have tested negative for the presence of zebra mussels. Although there are multiple other reservoirs throughout Kansas, Oklahoma, and Texas that are currently infested with zebra mussels, OTA0 only has one reservoir that has a confirmed population. Cheney Reservoir in southern Kansas has had a confirmed population of zebra mussels since



(Left) Kevin Bloom, TSC contractor, takes samples using a plankton net at McGee Creek Reservoir. (Right) An invasive species warning sign. Warning signs like this are often posted around lakes and reservoirs that have infested waters warning the public of potential risks posed by invasive mussels.





## Inspect and Clean Boats and Equipment Thoroughly

2007, and has since been implementing control measures to help protect the dam and associated infrastructure.

The samples taken from the reservoirs are analyzed by the contractor through cross-polarized light microscopy in order to identify the larvae of the mussels. These larvae vary from about 70-200 microns in size, slightly smaller than a grain of sand to the naked eye. Water samples which reveal suspect organisms are further analyzed by the polymerase chain reaction testing of DNA and also photographed with a scanning electron microscope to confirm or deny the presence of a mussel larva. In 2010, TSC analyzed samples from 361 water bodies throughout the western states. Additional tests of the water quality and phytoplankton levels of every reservoir are also made to help understand the conditions that seem to be conducive to mussel establishment and document aquatic ecosystem changes when mussels invade.

Once the presence of mussels is confirmed in a reservoir, Reclamation has a three to five year window in which they can implement the necessary protection for their facilities before mussel populations reach levels that impact infrastructure and operations.

The TSC is developing and testing several new technologies for protecting water and hydropower

systems from disruption by mussels. Early detection of any infestation will provide time to plan for and deploy these protective measures before an infestation becomes critical. In this way, delivery of water and power to the West will be better protected from the adverse effects of these invasive mussels.



(Above) Kevin Bloom measures water quality data at McGee Creek Reservoir.



# Balancing Budget Realities

By Tyler Johnson, Regional Public Affairs Officer

What does Nostradamus say about Reclamation's Budget for 2012!?

How does the Mayan Calendar, which ends December 21, 2012, reflect the realities of the 2013 Budget!?

In truth, the budget for this year and those to follow isn't all doom and gloom.

Historically the Reclamation Budget has hovered in the range of \$1 billion for the last 10 years and that hasn't changed.

While doing more with less is the by-product of an austere budget environment, Reclamation will likely continue with funding similar to previous years.

In relation to the Department, Reclamation accounts for roughly nine percent of DOI's total budget.

The emphasis for 2012 consists of supporting ecosystem restoration, renewable energy, cooperative landscape conservation, sustainable water supply, infrastructure, and strengthening Tribal Nations.

"Although GP has seen a budgetary decline in recent years, our

appropriations continue to reflect support for clean water, affordable power and renewable energy," said Great Plains Regional Director Mike Ryan.

President Barack Obama's 2012 budget request included a total of \$1.0184 billion for Reclamation. "The President's budget proposal promotes fiscal responsibility while maximizing the community, economic, and environmental benefits of Reclamation's projects and programs by promoting certainty, sustainability, and resiliency with respect to the use of water resources," said

Commissioner Michael L. Connor. "The President's proposal continues to ensure the reliable and efficient delivery of water and production of renewable, clean hydropower, but also reflects the tough choices we must make in order to address the critical budget deficit."

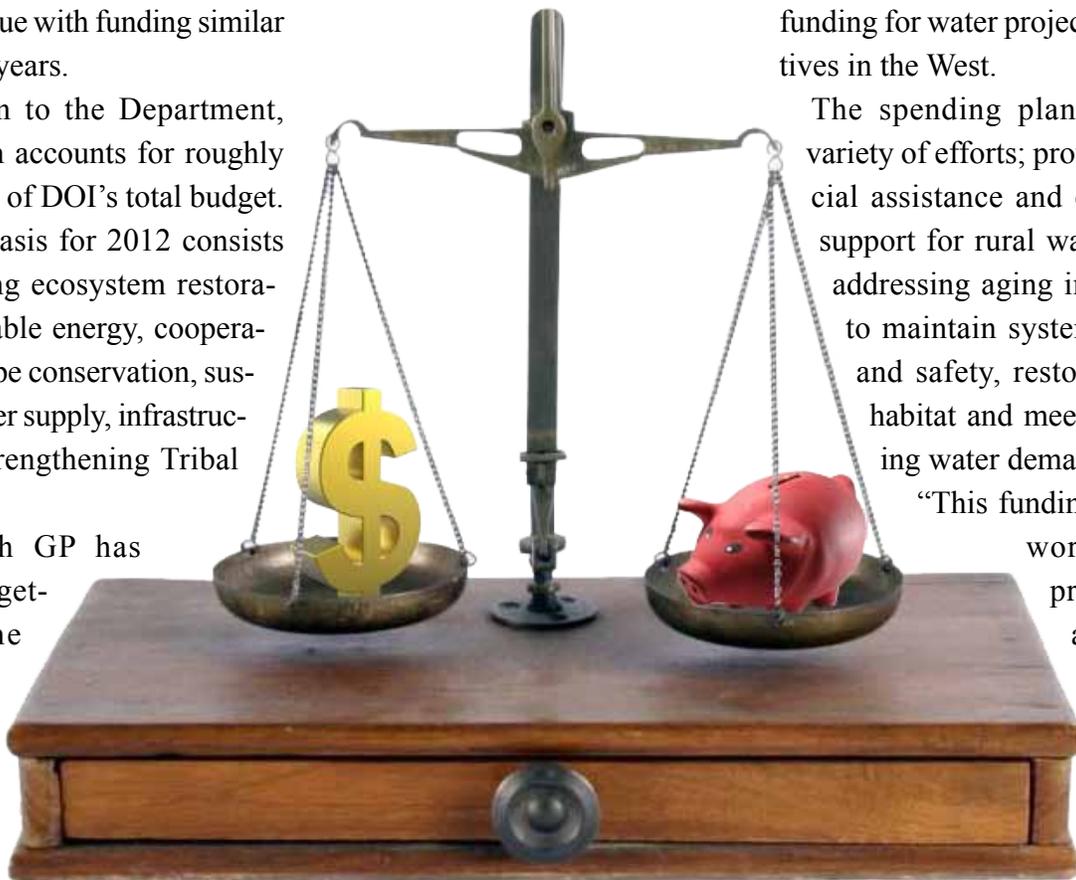
The budget's emphasis reflects Reclamation's balance of core missions and solving mounting pressure on available water resources.

In total, the funding addresses administration, departmental and Reclamation's collective priorities.

In Feb., Reclamation announced plans to allocate \$50 million in 2012 funding for water projects and initiatives in the West.

The spending plan supports a variety of efforts; providing financial assistance and construction support for rural water projects, addressing aging infrastructure to maintain system reliability and safety, restoring aquatic habitat and meeting increasing water demands.

"This funding will allow work on these projects to be accelerated and completed



sooner, saving the American taxpayers money,” said Connor. “The funding will also stimulate regional and local economies, support the creation of much-needed jobs and provide a stable and reliable water supply to communities throughout the West.”

Reclamation leadership developed this year’s spending plan based on a review of projects to ensure a balanced approach that includes mission priorities, relevance to strategic goals, program objectives and the directions contained in the Conference Report.

Reclamation continues to focus on the protection and restoration of the aquatic and riparian environments affected by operations.

Some highlights of Reclamation’s Ecosystem Restoration activities, many of which support the President’s America’s Great Outdoors initiative, and are also needed to fulfill Endangered Species Act programs.

In GP, \$11 million was allocated to implement the Platte River Endangered Species Recovery Implementation Program.

Another effort of Reclamation’s 2012 budget is a proposed \$58.9 million for the WaterSMART Program. The program is intended to help sustain and manage America’s resources for tomorrow and assist local communities.

WaterSMART will help improve water management by encouraging voluntary water banks, reducing demand, implementing water conservation and Title XVI water reuse

projects, and identifying opportunities to improve energy efficiency, promote renewable energy and reduce environmental conflicts. Reclamation will also partner with states, Tribes and local entities under the WaterSMART Program to develop the WaterSMART Clearinghouse website as a resource to provide leadership and assistance in coordinating and integrating water conservation and sustainable water strategies.

The budget continues support of tribal nations, most notably through the establishment of a new Indian Water Rights Settlements account in response to the Claims Resolution Act of 2010, which authorizes and establishes requirements for four water rights settlements benefiting the Crow Tribe in Montana.

For 2013, “The President’s budget supports Reclamation’s continued progress on the key priorities of our water agenda as we work to help address water resource challenges in the American West,” said Connor.

The proposal for Reclamation’s Water and Related Resources account of \$818.6 million includes \$395.6 million for resource management and development activities.

This funding provides for planning, construction, water conservation activities, management of Reclamation lands, including recreation and actions to address the impacts of Reclamation projects on fish and wildlife.

The request also emphasizes reliable water delivery and power

generation by requesting \$423.1 million to fund operation, maintenance and rehabilitation activities at Reclamation facilities, including dam safety.

There are \$69.6 million for rural water projects, of which \$51.6 million is for ongoing construction on seven rural water projects in Montana, New Mexico, North Dakota, South Dakota, Iowa and Minnesota, and \$18 million for operation and maintenance on completed tribal features for two of the projects.

Reclamation, throughout the 17 western states, is committed to helping meet the many water challenges of the West.

A driving force behind Bureau initiatives is resolution of water issues that will benefit future generations.

The current budget, although slightly reduced, still provides enough funding for Reclamation to deliver for the American people and successfully manage water in the West.



pursuit of

# EXCELLENCE

Reaching New Heights

## Highlighting Value: Reclamation's Administrative Professionals

By **Bobbie Mee, Secretary, GPRO**

This year's Great Plains Administrative Support Council (GPASC) conference was well attended.

A total of 29 employees attended the two-day conference.

"We all enjoyed networking with those who attended from the Regional office and our Area Offices from across the region" said Marcia Buchholz, Executive

Assistant at the GPRO.

The first day of the conference included Administrative Assistant training provided by Fred Pryor Seminars.

Jim Mitchell, the trainer, did an excellent job covering the amount of information in one day. The topics he touched on included, Effectively Working with Others; Dealing with Difficult People; Managing Multiple Priorities; Staying Organized, Focused and

In Control; Managing Time and Multiple Tasks; and Stress-Busters for Pressured People.

The feedback received so far has been very positive.

"Excellent, good speaker with wonderful ideas," and "I really enjoyed the ice breaker – great idea!" Another comment, "Jim was very effective...I liked the change in focus." "I really appreciated Jim's words of wisdom on how to deal with stress and difficult people,



and how we sometimes need to step back and ask if we can be the difficult person.”

Once the training portion of the conference concluded, the GPASC board conducted their business meeting. Marcia Buchholz, Executive Lead, thanked the outgoing board members Karen Jensen, Chairperson; Kerri Scharnowske, Vice-Chairperson; Sean Jones, Parliamentarian; and Bobbie Mee, Secretary, with a certificate and small gift. She then went on to announce the new board members, Sabina Birdwell, Chairperson; Cathie Schoer, Vice-Chairperson; Ann Warren, Parliamentarian; and Bobbie Mee, Recording Secretary. The board then voted on and approved the meeting minutes from 2011 Fall GPASC meeting held in Loveland/Denver.

The second day of the conference included a very informational presentation on 508 Compliance, presented by Tobias Taylor. Sabina Birdwell did an excellent job on her

presentation on correspondence and highlighting the new Reclamation Correspondence Guide guidelines. Donna Hirning gave us a glimpse of the Freedom of Information Act process and timelines.

Mike Ryan, Great Plains Regional Director, rounded out the morning’s presentations with a very interesting topic: “How to Manage Your Boss.” Mike emphasized two-way communication and the value of really knowing each other’s preferences as key for a successful relationship. He also opened up the floor for questions and answers and relayed his thoughts on workforce planning, travel restrictions, award funds, and time-off awards.

The conference concluded with the annual Administrative Professional and Service Professional Award presentation. Mike Ryan did the honors of highlighting each nominee by describing in a brief statement their outstanding accomplishments for this past year. They were presented with a certificate and a small gift.

The 2011 Administrative Professional of the Year nominees: Sabina Birdwell, GPRO; Bobbie Mee, GPRO; Belinda Scott, GPRO; Tobias Taylor, GPRO; June Thomsen, GPRO; and Micki Weimerskirch, DKAO.

The nominees for Administrative Services Professional of the Year were: Elvin Anderson, WYAO; Melissa Chastain, GPRO; Maria Jensen, DKAO; Sean Jones, GPRO; and Kevin Wilkerson, MTAO.

The 2011 Great Plains Administrative Professional of the Year: Bobbie Mee, Secretary for Regional Acquisition Services, Regional Office.

The 2011 Great Plains Administrative Services Professional of the Year: Melissa Chastain, Records Information Management Officers, Regional Office

The two Great Plains Region 2011 winners received a 24-hour time-off award, and a desk-top award.

**(Below) Jim Mitchell of Fred Pryor Seminars works with GPASC members on a variety of topics, ranging from dealing with difficult people and managing multiple priorities, to staying organized and dealing with stress.**



# High Winds Strike Yellowtail Afterbay

By Paula Holwegner, Administrative Officer, MTAO

**(Above) Strong winds punish Yellowtail Afterbay dam causing the contractor barge floating next to the dam to partially sink. (Right) The partially sunken barge.**



Early morning, on January 25, high winds, boasting gusts near 70 mph, raised havoc at Yellowtail Dam Afterbay near Fort Smith. The winds partially sunk a 20-by-40-foot barge and a pontoon boat being used by contractors working on the Afterbay rehabilitation project. The barge was taking on water but was not in danger of sinking according to the manufacturer.

Additionally, a small 16-foot pontoon boat flipped over by the high winds, and one of two pontoons on a 10-by-20-foot work boat tied to the barge was damaged. The craft had an inboard/outboard motor with a full 50-gallon gas tank.

The Contractor was directed to implement spill prevention measures by spreading an oil absorptive boom across the downstream area of the Afterbay Dam. It was discovered that the Contractor did not have enough to string all the way across.

In the meantime, the Yellowtail spill response team had been put on notice and the response trailer was prepped.

“The winds were about the strongest I’ve seen at the Afterbay,” said Tom Tauscher, Yellowtail Facility

Manager. “Although the winds alone would have given us cause to worry, the real issue on everyone’s mind was the 50 gallons of gas. It was a relief when the Contractor secured the boat in bay three, but it was even a bigger relief when we heard the gas had been removed from the craft altogether,” Tauscher added.

By late afternoon, the contractor was able to access and operate the 10’x 20’ pontoon boat and remove it from the Afterbay reservoir. No leakage of fuel was reported, and no damage to the tank was identified.

After several failed attempts, the damaged barge and smaller pontoon were removed from the Afterbay

Reservoir on Saturday, Feb. 4. The contractor cleaned up the site and transitioned back to working on the contract. “With project work or maintenance taking place at Yellowtail on an on-going basis, we remind ourselves to stay alert and be ready to react to any situation at any time of the day,” said Tauscher. “We have plans in place for just about any incident, and we participate in situational exercises, but my preference is to plan, be proactive, and be safe.”



**The contractor barge being hoisted from the reservoir after the wind storm. (Above left) The small pontoon boat thrashed by the high winds.**



# Coutant's Quick Action Saves Life



Regional Director Mike Ryan presents Brad Coutant (left) with the Department of the Interior's Exemplary Act Award on January 23 in recognition for his efforts to assist a fellow co-worker in distress.

By Tobias Taylor, Visual Information Specialist, GPRO

On Tuesday August 2, 2011, Regional Archeologist Brad Coutant saved a life. While at his workstation, Coutant heard labored breathing. Upon further investigation he discovered Rae Olsen, a co-worker in the Great Plains Resource Services Group, in a state of distress. He asked if she was choking and she confirmed by using the universal sign for choking, both hands clutching the throat. Coutant rendered assistance employing the Heimlich maneuver. He was able to successfully dislodge the obstruction and open her airway. After several moments Olsen was able to regain her abilities.

"After I helped Rae I discovered that I had performed the Heimlich incorrectly," said Coutant. "I had placed my fist in her sternum rather than in her diaphragm as you're supposed to. Fortunately, it still worked. I encourage people to learn how to perform the Heimlich correctly, but if you find yourself in a situation like that you need to do something, even if you're not exactly sure how to do it."

For his quick action, Coutant earned the Department of the Interior's Exemplary Act Award. An award established to recognize employees whose prompt decisions or actions significantly contributed to the saving of a life or helped another person in need of physical assistance.

## Choking

Choking occurs when a foreign object becomes lodged in the throat or windpipe, blocking the flow of air. Because choking cuts off oxygen to the brain, administer first aid as quickly as possible.

The universal sign for choking is hands clutched to the throat. If the person doesn't give the signal, look for these indications:

- Inability to talk
- Difficulty breathing or noisy breathing
- Inability to cough forcefully
- Skin, lips and nails turning blue or dusky
- Loss of consciousness

To perform the Heimlich maneuver on someone else:

1. Stand behind the person. Wrap your arms around the waist. Tip the person forward slightly.
2. Make a fist with one hand. Position it slightly above the person's navel.
3. Grasp the fist with the other hand. Press hard into the abdomen with a quick, upward thrust — as if trying to lift the person up.
4. Perform a total of 5 abdominal thrusts, if needed. If the blockage still isn't dislodged, repeat the five-and-five cycle.

If you're the only rescuer, perform abdominal thrusts before calling 911 or your local emergency number for help. If another person is available, have that person call for help while you perform first aid.



Source: Mayo Clinic



**Engineer of the Year**  
**Great Plains Region**

**2011**

**Doug Davis**

**Regional Native American Affairs Specialist**



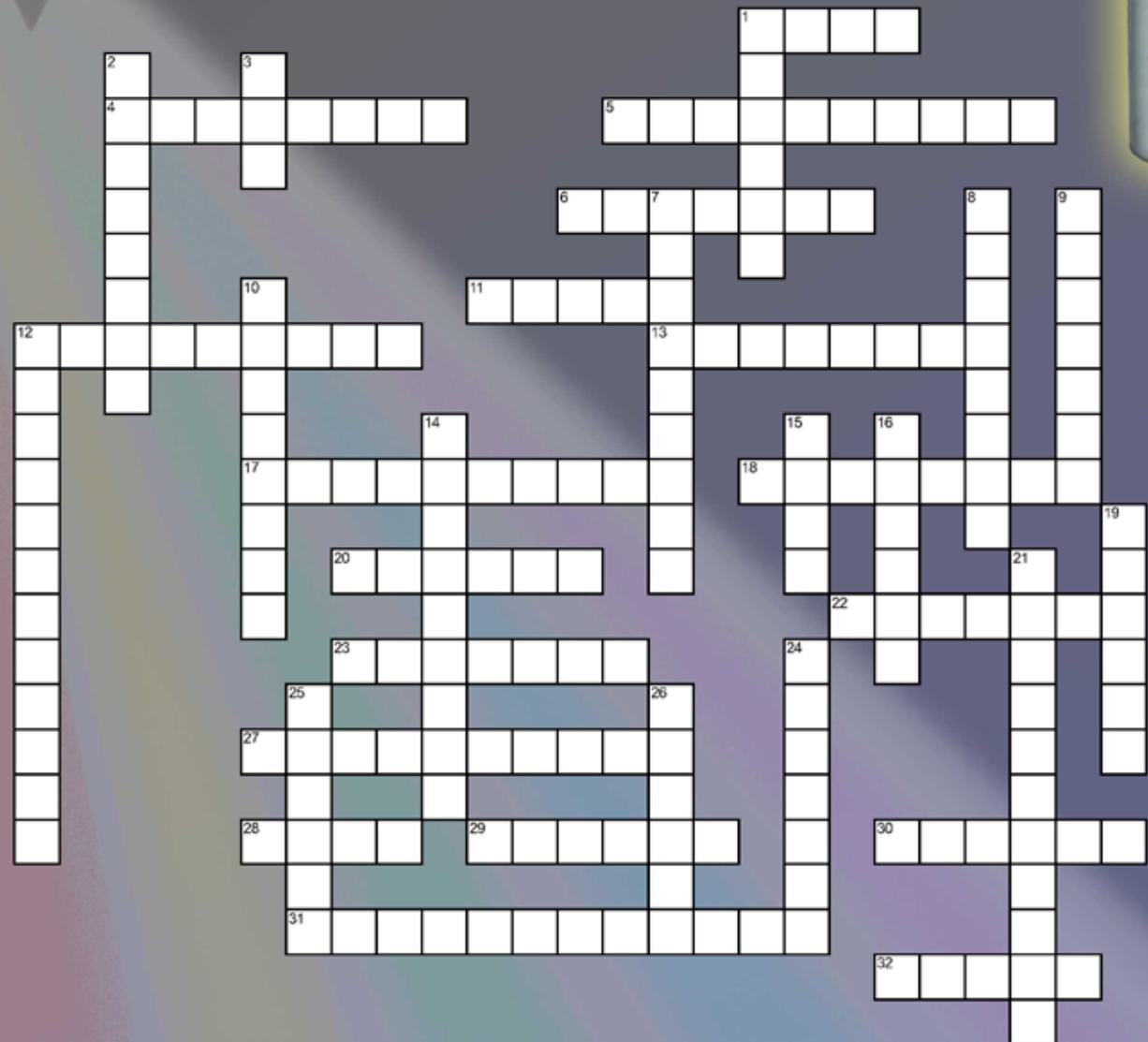
Doug Davis, center, along with other members of the Native American Affairs staff in the Great Plains Regional Office, participates in one of the final conference calls about the Crow Tribal Municipal, Rural & Industrial (MR&I) 638 contract. Davis was appointed as the Federal Implementation Team Chair by the Regional Director, the Commissioner and the Secretary's Indian Water Rights Office.

(At right) Davis receives the Engineer of the Year Award from Great Plains Regional Director Mike Ryan.





# Power Puzzle



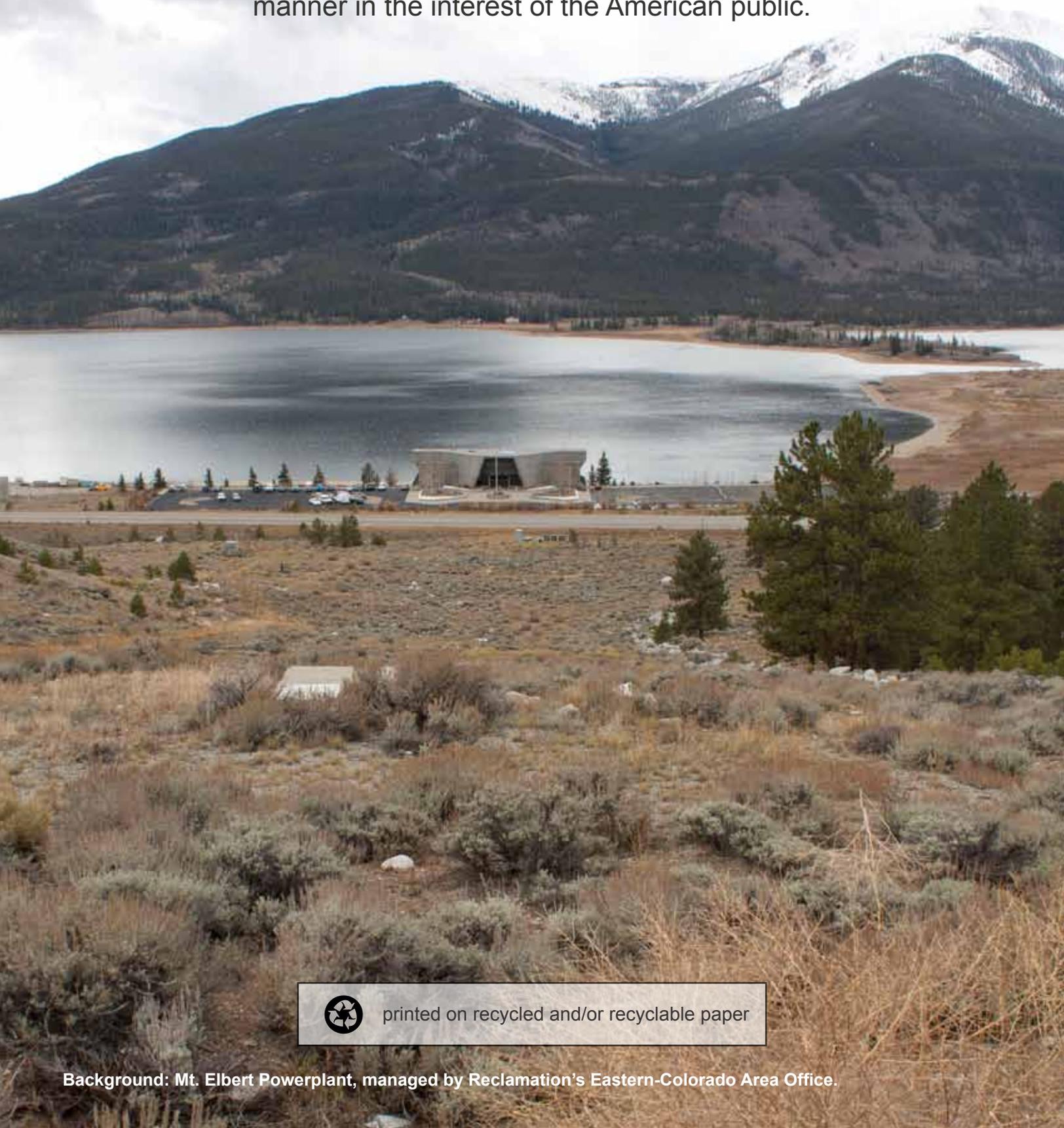
## ACROSS

## DOWN

- 1 Federal Energy Regulatory Commission.
- 4 GP powerplant received recent water conveyance upgrade (2 words).
- 5 Facility that switches, changes or regulates electric voltage.
- 6 Converts water pressure to motion.
- 11 Power generated by Reclamation.
- 12 Green power.
- 13 GP powerplant shares old (not in service) and new generators.
- 17 Outlet currently under construction in GP (2 words).
- 18 Measure of electrical energy (in thousands).
- 20 Worldwide \_\_\_\_\_ percent of all electricity is hydropower.
- 22 Amount of unused available capacity.
- 23 Spike in power demand.
- 27 Largest producer in GP Region.
- 28 Used to be part of Reclamation.
- 29 Creature impacting water and power facilities.
- 30 Reclamation is the \_\_\_\_\_ largest producer of hydro-electric power in the U.S.
- 31 \_\_\_\_\_ system.
- 32 \_\_\_\_\_ percent of U.S. dams produce power.
- 1 Fuels used to generate power.
- 2 \_\_\_\_\_ reserve: generating capacity at zero load and synchronized to system.
- 3 Generation less what is used by the powerplant.
- 7 First Reclamation powerplant.
- 8 Minimum amount of power delivered over time (2 words).
- 9 A conductor or series of conductors to carry electrical current.
- 10 Term denoting potential
- 12 Small capacity dam to minimize river fluctuation from peaking power generation.
- 14 Converts motion to electricity.
- 15 Delivers electricity.
- 16 One of Reclamation's iconic facilities.
- 19 Converted from falling water to electrical.
- 21 Device to change alternating current voltage.
- 24 27 \_\_\_\_\_ tons of CO2 are eliminated by Reclamation hydropower.
- 25 The rate power is delivered to or by a system.
- 26 Mount \_\_\_\_\_ Powerplant.

# Reclamation's Mission Statement:

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.



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