COLORADO
Colorado Water Conservation Board
Department of Natural Resources

1313 Sherman Street
Denver, CO 80203

P (303) 866-3441
F (303) 866-4474

Jared Polis, Governor

Dan Gibbs, DNR Executive Director

Rebecca Mitchell, CWCB Director

TO: Colorado Water Conservation Board Members

FROM: Kirk Russell, P.E., Chief, Finance Section

DATE: November 20-21, 2019 Board Meeting

AGENDA ITEM: 12a. 2020 Projects Bill
Non-Reimbursable Project Investments "En Bloc" Approval

Introduction

The Finance Committee reviewed the following Projects Bill - Non-Reimbursable Investment (NRI) applications on September 17, 2019 in Alamosa, Colorado. The Committee supported the projects listed below and recommended them for Board approval En Bloc. If approved, these NRIs will be provided to the Bill Sponsors for inclusion in the 2020 Projects Bill. Data Sheets for each project are included. No formal presentation will be made unless requested.

(1)	Satellite Monitoring System Maintenance Program - Continuation	Statewide	$380,000
(2)	Colorado Floodplain Map Modernization Program - Continuation	Statewide	$500,000
(3)	Weather Modification Permitting Program - Continuation	Statewide	$350,000
(4)	Colorado Mesonet Project - Continuation	Statewide	$150,000
(5)	Lidar Acquisition - Continuation	Statewide	$200,000
(6)	Litigation Fund – Refresh (up to $2M)	Statewide	Est.$1,200,000
(7)	Arkansas River DSS - Continuation	Arkansas	$500,000
(8)	CDSS Operations & Maintenance - Continuation	Arkansas	$500,000
(9)	Watershed Forecasting Partnership Program – Continuation	Statewide	$350,000
		Total	$4,130,000

Recommendation

Staff recommends the Board approve the Non-Reimbursable Investments listed above for inclusion in the 2020 Projects Bill.

Attachments: Data Sheets

COLORADO
Colorado Water Conservation Board
Department of Natural Resources

Satellite Monitoring/Maintenance Program

Colorado Water Conservation Board

November 2019 Board Meeting

PROJECT DETAILS	
Project Cost:	$380,000
NRI Funding Request:	$380,000
Funding Source:	*Construction Fund*
Project Type:	DWR Streamgaging
Type of Grantee:	State Agency

LOCATION	
Benefits:	Statewide
Water Source:	Various
Drainage Basin:	All Basins

This project entails the continued, long-term operational viability of the State Satellite Linked Monitoring System and Stream Gage Refurbishment Program, which is administered by the Division of Water Resources (DWR). This program currently encompasses 600 satellite stream gaging stations that require continued replacement of outdated data collection platforms, upgrades to transmission components, and refurbishment of the associated infrastructure. In addition, many existing gaging stations need to be modified to provide critical stream flow data for both flood and low flow monitoring. Changes in technology, which will ultimately increase reliability and real time data transmission rates, will require the DWR to continue to upgrade the system in the future. In addition, this project provides annual maintenance for the Arkansas River Basin Compact Lysimeter Research Project. The costs associated with the continued refurbishment and operational viability of the Satellite Monitoring System is currently approximately $330,000 per year. The cost associated with the Lysimeter Project is approximately $50,000 per year. The total project cost is $380,000.

Trinchera Creek Below Smith Reservoir – Cantilever and Radar Installation (Note these installations are more cost efficient as they require significantly less infrastructure than a typical stilling well and shelter)

COLORADO
Colorado Water Conservation Board
Department of Natural Resources

Colorado Floodplain Map Modernization

Colorado Water Conservation Board

November 2019 Board Meeting

PROJECT DETAILS	
Project Cost:	$5,600,000
NRI Funding Request:	$500,000
Funding Source:	*Construction Fund*
Project Type:	Matching Funds for Grants
Type of Grantee:	State Government

LOCATION	
Benefits:	Statewide
Water Source:	Various
Drainage Basin:	All Basins

Colorado has received approximately $29.32 million in federal grant dollars for floodplain mapping activities as part of the floodplain Map Modernization/Risk Map Program (Program) initiated by FEMA in 2003. The FEMA funds are being matched by CWCB and local cost-share dollars to implement the map update work to create updated digital floodplain maps and flood risk tools. The initial Program funds authorized in the 2003 and all subsequent Construction Fund Bills have provided the required non-federal matching dollars (80/20 cost share program). The State funds are further leveraged by local cost share dollars and in-kind services from many communities thus far. The total funding amounts have been instrumental in keeping Colorado as a lead state within FEMA Region 8 and will continue to benefit Colorado communities in the future. It is expected that significant FEMA funding will continue as long as the Program exists. Program deliverables will become part of the Flood DSS system to increase data capture and enhance Colorado's decision support tools.

The Program will eventually impact the entire state, and the objective is to develop updated watershed-based and/or countywide floodplain maps using current base map information within a digital environment. The use of GIS technology will be employed for all new countywide studies for ease of distribution, updating and viewing. The table below summarizes funding approved by FEMA for Federal Fiscal Year 2019, which starts October 1st and ends September 30, 2020.

Grant Description	FEMA Funding	Grant Description	FEMA Funding
FY19 CTP Grant	$352,409	Moffat County Phase 3	$480,005
FY19 Communications/Outreach Grant	$256,183	Las Animas Levee Pre-Analysis	$84,702
Delta County Risk Map Phase 3	$354,295	Prowers County Levee Pre-Analysis	$84,702
El Paso County Phase 2 Flood Risk Study	$536,651	Grand Junction Levee Pre-Analysis	$45,289
Teller County Phase 2	$206,876	SW BLE	$457,138
Bent/Otero Countywide Phase 2	$77,977	Lake County BLE	$111,078
Eagle County Phase 3	$120,821	Custer Fremont BLE	$183,150
Costilla Countywide Phase 3	$90,195	Bent/Otero BLE	$177,936
Phillips County Phase 3	$147,936	Prowers County BLE	$155,034
Lincoln County Phase 3	$56,835	Huerfano County BLE	$118,918
Mesa County Flood Risk Study Phase 2	$287,000	Park County BLE	$139,364
Lake County Phase 3	$187,190	Las Animas BLE	$208,164
Ouray County Phase 3	$145,984	Elbert County BLE	$134,551
San Miguel County Phase 3	$179,083	Gunnison County Phase 3	$242,846
Total FEMA Funding for FY 2019	**$5,622,312**		

COLORADO
Colorado Water Conservation Board
Department of Natural Resources

Weather Modification Permitting Program

Colorado Water Conservation Board

November 2019 Board Meeting

The CWCB has had grants since 2004 for water district sponsored cloud seeding programs developed after the early 2000s drought. In 2007, State-to-state agreements were signed to provide grants in Colorado. CWCB distributes grants from the CWCB, New Mexico Interstate Stream Commission, Southern Nevada Water Authority, Central Arizona WCD, and California Six Agency Committee. CWCB funding helps staff leverage pledged match funding from Lower Basin States water users. The CWCB goals are industry standard equipment in operation for efficient and effective programs.

PROJECT DETAILS	
Project Cost: $1.3M (matching from Lower Basin States and local sponsors)	
NRI Funding Request:	$350,000
Funding Source:	*Construction Fund*
Project Type:	Snowpack augmentation
Type of Grantee:	Local Water Districts

LOCATION	
Benefits:	Statewide
Water Source:	Various
Drainage Basin:	All Basins

Last year the State of Wyoming partnered with the CWCB and the Jackson Water Conservancy District helping to launch Colorado's first permitted aerial cloud seeding program. Some of the requested funding increase will help to continue this new state-to-state collaboration in the North Platte Basin. A 2015 National Center for Atmospheric Research Climatology of seeding potential study showed high seeding potential in the North Platte. The local goals are to augment snowpack in the southeastern part of the basin. Potential programs for this upcoming water year aim at siting new remote generators in locations that will provide an increase in snowpack to multiple watersheds.

Since 2007 the Lower Basin Water Users in the Colorado River (Southern Nevada Water Authority, California Six Agency Committee, and Central Arizona WCD) have donated $2.8M to match the CWCB's $2.6M to bolster locally sponsored cloud seeding in Colorado. Each year about $1M is spent with $175,000 or 18% from the CWCB and $175,000 or 17% from the Lower Basin and New Mexico. The other 65% of the funding comes from ski areas, water districts, towns and counties.

Effective cloud seeding requires siting cloud seeders high onto ridges in areas of good airflow to ensure the silver iodide particles are regularly transported into clouds. We have had success at helping upgrade programs with new high elevation seeders at: Winter Park, Grand Mesa, Crested Butte, above McPhee Reservoir, near Mancos, and Telluride. These seeders are now owned by water districts. It has been clearly demonstrated that low elevation manually operated seeders are not particularly effective at getting seeding material in cloud. High elevation seeding equipment is needed. Colorado has high elevation terrain and siting remote generators at high altitudes is vital for effective seeding.

The CWCB has ten years of facilitating successful multi-state collaborations to work on a watershed basin to benefit local water supplies and downstream river compact obligations. In 2015, a ten year $15M winter research experiment in Wyoming concluded that 5-15% increases in snowpack can be expected but only from about 30% of the storms appropriate for seeding. Therefore, a 1-5% increase in snowpack was demonstrated and can be expected in well designed and executed programs. As we move forward, Colorado must continue to investigate and pursue opportunities for collaboration between basins to benefit multiple watersheds and thus the entire state as a whole.

COLORADO
Colorado Water Conservation Board
Department of Natural Resources

Colorado Mesonet Project

Colorado Water Conservation Board

November 2019 Board Meeting

PROJECT DETAILS	
Project Cost:	$150,000
NRI Funding Request:	$150,000
Funding Source:	*Construction Fund*
Project Type:	Data Collection/Maint.
Type of Grantee:	State Government

LOCATION	
Benefits:	Statewide
Water Source:	Various
Drainage Basin:	All Basins

The Colorado Climate Center runs the Colorado Agricultural Meteorological (CoAgMet) network consisting of 75 stations statewide tracking agricultural weather, climate and drought. The Center also manages the Colorado Reginal Climate Reference Network (CO-RCRN) which consists of 17 high-quality precipitation and temperature monitoring stations located in pristine environments. These sites, started by NOAA, were intended to monitor the climate over long periods of time in areas free of urbanization and with datasets free of station moves, changes in observation time and other factors that create inhomogeneity in climate datasets. Current base funding for these networks does not allow for them to be run at high quality levels and still develop products to enhance the data. CO-RCRN needs multiple station visits per year to add and remove fluids from rain gauges. The CoAgMet network, in order to be run as a reliable mesonet for real-time weather monitoring, drought monitoring, and calculations of consumptive use needs close attention paid to quality control and making sure all sensors are functioning properly. If they aren't, a technician should be deployed as soon as possible to resolve issues (particularly during the growing season). Due to budget and staff constraints, products cannot be developed while providing the close attention needed for quality data.

July 2015, CoAgMet received the first funding from the state to begin moving towards a multipurpose state "Mesonet" focusing on agricultural and water resources as well as long-term climate monitoring and short term real-time weather tracking to aid weather prediction, emergency management and other diverse uses. With this funding, we have been able to develop products and tools greatly needed to enhance data, identify and implment areas for expansion and upgrading to newer technology in order to provide beneficial real-time weather data. Stations in the network are now transmitting data every 5 minutes and the network covers and reasonably represents the weather conditions of the majority of state, resulting in and broader application and surveillance capabilities.

In order to continue expanding and improving the Colorado Mesonet data and products, and track long term climate conditions that could impact our water resources, continuation of the state funding is needed. Funds will allow effective enhancements to the CoAgMET network, improved delivery of data and new products for water use planning and climate change monitoring. They will improve real-time monitoring capabilities to improve severe weather warnings and emergency management applications.

Importantly, this grant funding will be used to qualify for federal matching funds through the National Mesonet to support critical operations and maintenance needs.

COLORADO
Colorado Water Conservation Board
Department of Natural Resources

Colorado Lidar Data Acquisition Program

Colorado Water Conservation Board

November 2019 Board Meeting

PROJECT DETAILS	
Project Cost:	$2,200,000
NRI Funding Request:	$200,000
Funding Source:	*Construction Fund*
Project Type:	Matching Funds for Grants
Type of Grantee:	State Government

LOCATION	
Benefits:	Statewide
Water Source:	Various
Drainage Basin:	All Basins

Colorado has received approximately $5.6 million in federal grant dollars for elevation data acquisition activities to support the floodplain Map Modernization/Risk Map Program in Colorado. High quality topographic data is necessary to develop accurate FEMA flood hazard mapping. Additionally, the Colorado Hazard Mapping program relies on high quality elevation data for debris flow mapping and fluvial hzard mapping. The FEMA funds can be leveraged through the U.S. Geological Survey (USGS) 3DEP Program (3D Elevation Program).

The 3DEP Program (Program) was developed to respond to a growing need for high quality topographic data nationwide. The primary goal of this Program is to systematically collect 3D elevation data in the form of light detection and ranging (lidar) across the U.S over an 8-year period. Lidar technology has many uses and is utilized across many different industries. In addition to floodplain mapping, other examples of lidar uses include determining forest biomass, measuring snow pack, transportation planning, identification of reclamation mining sites, and geohazard mapping.

The Program is a unique opportunity for collaboration between all levels of government and to leverage services and expertise of private sector mapping firms to acquire the data. The CWCB has been contacted by several local, State, and Federal organizations, including the Colorado Department of Transportation (CDOT), Colorado Geological Survey (CGS), Division of Reclamation and Mining Services (DRMS), and the U.S. Forest service, with great interest in partnering on future lidar acquisitions in Colorado. The CWCB can leverage FEMA and State funds to obtain USGS funding through the 3DEP Program. This Program requires a 25% non federal cost share for acquisition projects in order to receive USGS matching funds up to 50% of the total cost of the projects.

Similar to the FEMA Map Modernization Program where the CWCB has leveraged millions of federal dollars for floodplain mapping Colorado, this is a rare opportunity to leverage additional federal funds with State dollars and provide communities across the State with up to date, accurate elevation data that can be utilized for a multitude of purposes.

COLORADO
Colorado Water Conservation Board
Department of Natural Resources

Litigation Fund

Colorado Water Conservation Board

November 2019 Board Meeting

PROJECT DETAILS	
Project Cost:	$1,452,700
NRI Funding Request:	*Up to* $2,000,000
Funding Source:	*Construction Fund*
Project Type:	Legal Support
Type of Grantee:	State Government

LOCATION	
Benefits:	Statewide
Water Source:	N/A
Drainage Basin:	All Basins

Section 37-60-121(2.5) provides that the Colorado Water Conservation Board is authorized "to expend, pursuant to continuous appropriation and subject to the requirements of paragraph (b) of this subsection (2.5), a total sum not to exceed the balance of the litigation fund, which is created, for the purpose of engaging in litigation…to defend and protect Colorado's allocations of water in interstate streams and rivers…" Paragraph (b) of section 121(2.5) provides: "pursuant to the spending authority set forth in paragraph (a) of this subsection (2.5), moneys may be expended from the litigation fund at the discretion of the board if (I) with respect to litigation, the Colorado Attorney General requests that the Board authorize the expenditure of moneys in a specified amount not to exceed the balance of the fund for the costs of litigation associated with one or more specifically identified lawsuits meeting the criteria set forth in paragraph (a) of this subsection (2.5)."

The CWCB has received a letter from Attorney General Phil Weiser stating that a total of $1,452,700 will be needed in FY19/20 to adequately: defend in negotiations; litigation; and other processes the State's apportionments under the Compacts. The funds will be allocated as follows:

1) Colorado River Basin: $695,000 for FY19/20
2) Republican River Basin: $110,000 for FY19/20
3) Rio Grande Basin: $647,700 for FY19/20

The CWCB will request a refresh of the Litigation Fund up to $2,000,000 each year through annual appropriations in order for the Board to respond to unforeseen legal challenges.

COLORADO
Colorado Water Conservation Board
Department of Natural Resources

Arkansas River Decision Support System

Colorado Water Conservation Board

November 2019 Board Meeting

PROJECT DETAILS	
Project Cost:	$7,590,000
NRI Funding Request:	$500,000
Funding Source:	*Construction Fund*
Project Type:	Other
Type of Grantee:	State Government

LOCATION	
Benefits:	Statewide
Water Source:	N/A
Drainage Basin:	Arkansas

Colorado's Decision Support Systems (CDSS) are a joint effort of CWCB and DWR, with the purpose of providing data and analytical tools to aid in water resources planning and management in the State. Basin DSSs take a deep-dive into each major river basin in Colorado and add information, data, and models for that Basin to the statewide sets. Currently there are Basin DSSs in place for the Colorado River, Rio Grande, and South Platte Basins.

The Arkansas River Decision Support System (ArkDSS) is the last DSS to be developed for CDSS. The feasibility study was completed in December 2011, resulting in an estimated total cost of $7,590,000. $2,750,000 has previously been approved by the Board. Work will conclude in 2020 on the first phase of ArkDSS, which includes three major components of ArkDSS: spatial system integration (GIS); consumptive use analysis and surface water planning model development; and administration and accounting tool development.

The funding requested herein will be used to continue the ArkDSS implementation (Phase II). Phase II priorities include additional surface water modeling in support of the Trinidad Reservoir 10-year review, additional administration tools, an update of the StateCU graphical user interface (GUI), compilation of groundwater data into full gridded datasets, and installation and maintenance of streamflow gages, monitoring wells, and telemetry equipment.

COLORADO
Colorado Water Conservation Board
Department of Natural Resources

Colorado's Decision Support System (CDSS) Operation & Maintenance

Colorado Water Conservation Board

November 2019 Board Meeting

This funding request is for ongoing operation and maintenance of Colorado's Decision Support Systems (CDSS), a joint effort between CWCB and DWR to provide data and modeling tools to assist in water resource planning and management in Colorado. Over the last 25 years, HydroBase databases, GIS databases, analytical tools, and consumptive use, surface water allocation, and groundwater models have been developed and implemented for most of the State, with development of the Arkansas River DSS finishing its first phase in 2020. These CDSS components require maintenance and operational revisions to protect the State's investment and keep the tools viable as water resource planning becomes more technical and data-driven in the future. CDSS data and tools are crucial in State planning, including the Water Plan Technical Update and studies involving the Compacts, water court engineering analysis, federal water accounting for endangered fish flow, and protection of the State's interests when it comes to Compact allotment and negotiations of agreements such as the upcoming Colorado River Interim Guidelines.

PROJECT DETAILS	
Project Cost:	$500,000
NRI Funding Request:	$500,000
Funding Source:	*Construction Fund*
Project Type:	Operations & Maintenance
Type of Grantee:	State Government

LOCATION	
Benefits:	Statewide
Water Source:	N/A
Drainage Basin:	All CDSS Basins

COLORADO
Colorado Water Conservation Board
Department of Natural Resources

Water Forecasting Partnership Project

Colorado Water Conservation Board

November 2019 Board Meeting

The water forecasting partnership project began in the FY2016/2017 under SB 16-174. This original authorization appropriated $300,000, and was reauthorized for in both HB17-1248 and SB18-218 for $800,000 each fiscal year. Of those original appropriations, $200,000 remains unencumbered. Staff requests $350,000 be appropriated for continuation of this work in FY 2020/2021. The new funds will be used to complete the projects described in the table below. The goal of this program is to acquire new data and refine water supply forecasting. Matching funds will be sought from partners.

A highlight from previous funding years is the RIO-SNO-FLOW project; a multi-year scientific collaboration between CWCB, Conejos Water Conservancy District, NCAR, NASA, and NRCS to refine water supply forecasting in the Conejos Basin.

PROJECT DETAILS	
Project Cost:	$550,000
NRI Funding Request:	$350,000
Funding Source:	*Construction Fund*
Project Type:	Data and Modeling Upgrades
Type of Grantee:	Funding for Partnerships

LOCATION	
Benefits:	Statewide
Water Source:	Various
Drainage Basin:	All Basins

FY 2020-21 Proposed Funding			
Location	**Item**	**Cost**	**Notes**
Gunnison	NASA ASO Flight	$250,000	One peak snow flight for Ohio, Taylor, and East River Basin for winter 2020-2021. These flights are meant to help forecast inflows into Taylor and also compliment Crested Butte in a large multi-year research project funded by Department of Energy conducted by the Lawrence Berkeley National Lab (LBNL). LBNL has also funded proposals to evaluate the NASA datasets in the Gunnison Basin.
Rio Grande	NCAR	$40,000	Maintain 6 stations in Conejos Gunnison basin in partnership with Conejos WCD. Provide forecasts using NOAA's multi-radar multi sensor method from the new radar into the national water model.
Statewide	SNODAS DSS Work	$40,000	Maintain (SNODAS) daily snowpack data in the DSS and on the Open Water Foundation website.
Southwest	NCAR	$85,000	Provide experimental forecasting using multi-radar multi-sensor methods to calibrate the radar. This includes 3 new SNOTEL-Lite stations for snowpack runoff and flash flood forecasting.
Continuing Projects			
Statewide	Soil & solar radiation sensors	$35,000	Soil moisture and solar radiation sensors will be installed on SNOTEL Stations.
Statewide	NRCS SNOTEL Stations	$60,000	Upper Gunnison River WCD requested one NRCS SNOTEL Station, Upper Arkansas River WCD requested two SNOTEL Stations.
Western Slope	CSAS Database	$40,000	Develop online database for Center for Snow and Avalanche Studies.
Total:		$550,000	
Available Balance		$200,000	
New Request		**$350,000**	