

December 1, 2015

Ms. Molly Otto
Legislative Librarian
Colorado Legislative Council
Room 029, State Capitol
Denver, CO 80203

Representative Millie Hamner
Chair, Joint Budget Committee

Representative Ed Vigil
Chair, House Agriculture, Livestock, & Natural Resources


Senator Jerry Sonnenberg
Chair, Senate Agriculture, Natural Resources, and Energy Committee
c/o Colorado General Assembly
200 East Colfax
Denver, CO 80203

Dear Ms. Otto and Representatives Hamner and Vigil and Senator Sonnenberg:

Pursuant to §23-41-210 C.R.S., I respectfully submit the following annual report on the Colorado Geological Survey to the Colorado General Assembly.

Please let me know if you have any questions on the report or would like additional information.

Best regards,



Karen Berry
State Geologist and Director
Colorado Geological Survey at the Colorado School of Mines
(303) 384-2640
kaberry@mines.edu

2015 Report to Colorado General Assembly on the Transfer of the Colorado Geological Survey

I. Overview and Update

Pursuant to §23-41-201 C.R.S., the Colorado Geological Survey transferred from the Department of Natural Resources to the Colorado School of Mines on January 31, 2013. The survey reports to the Dean of the College of Earth Resource Sciences and Engineering at Mines. This organizational structure allows CGS to collaborate with key departments of Geology & Geological Engineering, Geophysics, Mining Engineering, and Economics and Business, which all report to the same college.

CGS continues to assist communities devastated during the 2013 flooding disaster. Hundreds of debris flows and landslides were triggered along the Front Range causing loss of life and extensive damage to public and private infrastructure. To help local communities avoid or mitigate existing and future hazards, CGS recently completed a debris flow susceptibility map of Larimer County and will complete additional debris flow and landslide susceptibility maps for other Front Range counties; including El Paso County.

In 2014, a very large, extremely rapid, landslide occurred in Mesa County killing three local residents. Ongoing potential threats to residents include additional landsliding and flooding. CGS recently completed an investigation and released a report on the landslide and continues to provide assistance to the county. In addition, CGS will complete an evaluation of landslide hazards throughout Mesa County using new mapping tools (LiDAR).

In 2015, following heavy spring precipitation, landslides damaged homes along the west side of Colorado Springs. CGS provided emergency assistance to the city and the Colorado Department of Emergency Management and continues to provide technical assistance as needed.

CGS will release a report on the mineral and energy industry activities in the state for 2014-15 in January. CGS is also gathering information on the approximately 23,000 abandoned mines sites across the state for the Colorado Department of Health and Environment. Several abandoned mine inventories have been conducted by various federal and state agencies since 1970. However, the inventories are separate databases that are not easily accessible by the public, emergency planners, state agencies and researchers. CGS is developing a single, accessible database and will identify gaps in existing data. The goal is to prioritize areas for additional assessment of environmental and public safety risks from abandoned mines.

II. Functions and Objectives of Colorado Geological Survey

In the executed memorandum of understanding between Colorado School of Mines and the State of Colorado's Department of Natural Resources, the State provided funding, from the Operational Severance Tax Trust Fund, for the following public safety functions:

- Review of schools for geologic hazards.
- Review of preliminary development plans for geologic hazards.

- HB1041 Areas/Activities of State Interest – Geologic hazard technical assistance to state and local governments.
- Create Guidelines for land use in natural hazard areas.
- Designate suitable areas for hazardous waste disposal.
- Define and map geological hazards for city/county master plans.
- Determine areas of natural geologic hazards that could affect the safety of or economic loss to the citizens of Colorado.
- Assist and advise state and local governments on geologic problems.
- Collect and preserve geologic information related to geologic hazards.
- Evaluate the physical features of Colorado, related to natural hazards, for human and animal use.
- Prepare, public and distribute reports, maps and bulletins when necessary to meet statutory mission related to land use and geologic hazards.

Through SB13-230, the General Assembly provided funding (General Fund) for the Geological Survey to perform additional functions related to mineral, energy, and water resources:

- Provide technical assistance to state and local governments on mineral and energy resources including geothermal.
- Assist and advise state and local governments on geologic problems related to mineral and energy resources.
- Prepare, publish and distribute reports, maps and bulletins when necessary to meet statutory mission related to mineral and energy resources.
- Provide advice and assistance to the Oil and Gas Conversation Commission as necessary.
- Collect and preserve geologic information related to mineral and energy resources.
- Update maps of commercial mineral deposits.
- Inventory and analyze the State’s mineral and energy resources as to quantity, chemical composition, physical properties, location and possible use.
- To conduct scientific studies of how geology affects and controls water resources, especially within Colorado.

It is anticipated that these functions will remain the priority of the Colorado Geological Survey for FY 16-17 pending continued funding levels from the Operational Severance Tax Trust Fund and the General Fund.

However, efforts to provide these statutory functions, at the same service levels prior to the transfer, are limited by budget and staffing constraints. As part of the transfer, overall appropriations from the Operational Severance Tax Trust Fund to CGS were reduced by 40% and STAX appropriations to the mineral, energy, and water resources functions were eliminated.

As noted above, SB13-230 restored some funding to the non-public safety functions but total funding and FTE was reduced by 70%. Prior to the transfer, total appropriations for the mineral resource, ground water and energy functions were \$1,336,333. Of this amount, \$924,121 was from the Operational Severance Tax Trust Fund.

III. Funding

State funding. For fiscal year 2015-16, \$1,408,265 has been appropriated from the Operational Severance Tax Trust Fund and \$442,211 has been appropriated from the General Fund. In addition, through SB15-245, the General Assembly authorized \$100,000 in General Fund for CGS to complete the debris flow mapping outlined in Section I.

The FY15-16 general fund appropriation includes the addition of 1 FTE and an increase of \$105,494. The additional resources allow CGS to improve assistance to local governments and agencies on geologic hazard maps and planning, providing post-disaster response and recovery technical assistance.

The support from the General Fund is greatly appreciated. Without this funding, the Colorado Geological Survey would not have sufficient funding to continue to provide services related to mineral, ground water and energy resources listed in Section II of this report.

Major funding sources outside of severance tax or general fund include:

- Colorado Department of Transportation
- Colorado Water Conservation Board
- Colorado Department of Health and Environment
- USGS
- Fees for Services to Local Governments
- NASA
- Colorado Energy Office

IV. FTE

15.5 positions are budgeted to fulfill the prioritized functions of the Survey.

V. Collaborations and funding sources

Below is a chart identifying collaborations and partners by functional areas.

Statutory Objective	Partner	Partner	Partner	Partner	Partner
Geologic Hazards					
Review of schools, development plans, and land-use plans for geologic hazards. Provide technical assistance to local governments.	Municipalities, Counties and School Districts	Colorado Department of Emergency Management	Colorado Water Conservation Board	Colorado Department of Local Affairs	Colorado Recovery Office
Prepare, publish, and distribute reports, maps and bulletins when necessary to meet statutory mission	Colorado School of Mines	Colorado Department of Emergency Management	Colorado Oil & Gas Conservation Commission	USGS	
Determine areas of natural geologic hazards that could affect the safety of or economic loss to the citizens of Colorado	Colorado Department of Emergency Management	Colorado School of Mines	Municipalities and Counties	Colorado Recovery Office	Colorado Water Conservation Board and OIT
Mineral and Energy Resources					
Identify areas with commercial mineral deposits	Municipalities and Counties	Colorado State Land Board	USGS		
Promote economic development of mineral and energy resources	Colorado Energy Office	Colorado School of Mines	Municipalities and Counties	Colorado State Land Board	
Prepare, publish, and distribute reports, maps and bulletins when necessary to meet statutory mission	Colorado Mining Association	Colorado School of Mines	University of Colorado	Colorado State Land Board	Municipalities, and Counties
Inventory and analyze the state's mineral and energy resources as to quantity, chemical composition, physical properties, and possible use	Colorado School of Mines	Municipalities, and Counties	Colorado State Land Board	NASA	Colorado Energy Office
Water Resources					
To conduct scientific studies of how geology affects and controls water resources	Colorado Water Conservation Board	Coalition for the Upper South Platte	Counties	Colorado School of Mines	Colorado Department of Health and Environment
Prepare, publish, and distribute reports, maps and bulletins when necessary to meet statutory mission	Colorado Water Conservation Board	Coalition for the Upper South Platte	Counties	Colorado Department of Health and Environment	Colorado School of Mines