



## Meeting Minutes

### Big Dry Creek Watershed Association Meeting

**Date/Time:** December 8, 2020, 1:00 to 3:00 p.m.

**On-Line:** Microsoft Teams Meeting

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- 1. AgES and SWAT Modeling of Hydrological Processes and Nitrate Transport in the Big Dry Creek Watershed:** Dr. Timothy R. Green at USDA-ARS in Fort Collins provided an update on the research that he and Anoop Valiya Veettil at Colorado State University conducted in the Big Dry Creek Watershed using two models: AgES (Agricultural Ecosystems Services) and SWAT (Soil and Water Assessment Tool). BDCWA provided data from its long-term water quality monitoring program to support the research. Modeling results for hydrological processes and nitrate transport in the Big Dry Creek Watershed were provided in a Powerpoint presentation. Highlights included:
  - Spatially distributed process models represent soil-water-plant-nutrient interactions within a watershed. CSU/ARS investigated spatial patterns of water balance components and nitrate transport simulated using the fully distributed AgES (Agricultural Ecosystems Services) and the semi-distributed SWAT (Soil and Water Assessment Tool, 2012) models in the Big Dry Creek Watershed.
  - CSU/ARS researchers analyzed patterns of hydrological fluxes using daily model outputs for the period 2010–2018. The two models simulated drastically different spatial patterns. SWAT predicted extremely low interflow and routed excess irrigation water to surface runoff and groundwater discharge. AgES produced realistic estimation of streamflow, irrigation return flows, and nitrate; simulation of less surface runoff and greater interflow and baseflow contributed to improved simulation of nitrate transport in the interior watersheds. This study demonstrated the impacts of simulating spatially explicit hydrology that captures interactions among fields and other areas within a managed watershed.

- Accurate treated wastewater inputs and simulated irrigation return flow were critical for simulating nitrate transport.
- The study was accepted for publication in *Environmental Modeling and Software* and is accessible here: <https://doi.org/10.1016/j.envsoft.2021.105000>.

Discussion:

- The group expressed interest in modeling results for total phosphorus, in addition to nitrogen model outputs described in the presentation.
2. ***E. coli* Special Study Progress Update:** Jane Clary provided a summary of the *E. coli* special study between Standley Lake and I-25 that included instream and dry weather outfall sampling. The City of Westminster is following up on a few areas and an update will be provided at a future BDCWA meeting in 2021. The conclusions of the study to date according to study objective include:
- Do stormwater outfalls flowing under dry weather conditions have elevated *E. coli* concentrations?
    - i. 2 of 13 stormwater outfalls flowing under dry weather conditions (outfalls 73 and 74) had *E. coli* elevated above the stream standard for the study period based on the geometric mean concentration of five sampling events conducted during a 61-day period under dry weather conditions.
    - ii. 6 of 13 outfalls had one or more individual *E. coli* sample results above 126 MPN/100 mL.
  - Do flowing outfalls with elevated *E. coli* under dry weather conditions have human source contributions?
    - i. 3 stormwater outfalls (#73, 46 and 69) flowing under dry weather conditions had one or more sample results with HF183 elevated above a 1,000 copies/100 mL threshold.
    - ii. 1 outfall (#73 in the Stratford Lakes area) had both persistently elevated HF183 and elevated *E. coli* above the stream standard for the study period.
    - iii. 2 outfalls (#46 and 69) had geometric mean *E. coli* results below the stream standard, but intermittently had one or more HF183 sample result greater than 1,000 copies/100 mL. These observations are based on three sampling events that included HF183 analysis.
  - What are potential sources of *E. coli* upstream of WWTP discharges in the stream segment?

- i. The findings from this study, as well as the previous exploratory study by the City and County of Broomfield, indicate that a combination of sources may be contributing to elevated E. coli instream.
- ii. Human sources are present at three outfalls and bird sources are present at the  $10^3$  to  $10^4$  copies/100 mL level instream.
- iii. Other sources such as dogs (and other canines) were not evaluated in the 2020 study

Discussion:

- The potential role of reclaimed water in HF183 detections was identified as warranting further discussion.
- Westminster staff are continuing to conduct follow-up investigations reviewing CCTV for Outfall 73.
- The City of Westminster has a major upcoming sanitary interceptor replacement project in the Westminster Open Space area. The City is doing before and after upstream monitoring for E. coli and other pollutants to assess whether the project has an effect on instream E. coli.

**3. Business Items:**

- Julianna Archuletta described her vision for an outreach map that highlights key features in the Big Dry Creek Watershed, particularly those that can be accessed along the bike trail. She has started the process and would like input in 2021 to complete this outreach piece.
- Jane will complete preparation of the Big Dry Creek annual newsletter by the end of the year. Additionally, dues requests will be sent to financially supporting members in January 2021 at the levels agreed upon at the September 2020 Board meeting.
- Biological monitoring was successfully completed by Aquatics Associates and volunteers from the cities in October. Findings from the sampling will be available in 2021. Tami Schneck will provide a brief update for the 2020 newsletter.
- The Non-standard MS4 Stormwater Discharge Permit was put out for a second public notice and a final version is expected in 2021. The permit will likely have dry weather monitoring requirements and other requirements for Front Range Community College and serve as a preview of likely requirements in the standard MS4 Phase 2 permits, which affect the cities and counties in the watershed.

4. **Next Meeting:** Virtual Meeting for Watershed Annual Water Quality Report will be held in April or May 2021, date and meeting method to be determined, but likely an on-line Microsoft Teams meeting.

**Attendance (Via Online Teams Meeting)**

Anoop Valiya Veetil, Colorado State University  
Tim Green, USDA Agricultural Research Service  
Kenan Diker, Colorado Department of Public Health and Environment  
Holm Kipka, Colorado State University  
Juliana Archuleta, Adams County  
Kelly Cline, City of Westminster  
Lesa Julian, City and County of Broomfield  
Bob Fiehweg, Citizen  
Lyndsay Holbrook, Weld County  
Laura Hubbard, City and County of Broomfield  
Jake Moyer, City of Westminster  
Heather Otterstetter, City of Westminster  
Al Quintana, City of Thornton  
Shelley Stanley, City of Northglenn  
Tony Steck, City of Northglenn  
Tara Wilson, City of Westminster  
John Winterton, City of Northglenn  
Jim Kaiser, City of Thornton  
Dominic Baca, City and County of Broomfield  
Stephen Scafe, City and County of Broomfield  
Haley Rogers, Wright Water Engineers  
Jane Clary, Wright Water Engineers

These minutes of action constitute the record of the meeting of the General Membership and Board of Directors of the Corporation and any officer of the Corporation is hereby authorized to certify any action taken by these minutes of action as having been duly taken or ratified by the Board of Directors of the Corporation on December 8, 2020, notwithstanding the date of actual signing. Meeting minutes were prepared for the Secretary by Watershed Coordinator, Jane Clary.

By: \_\_\_\_\_  
BDCWA Secretary