

Stream discharge monitoring in seven watersheds on Mt. Desert Island, ME

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7 New Discharge Monitoring Stations:

Continuous stream discharge measurements are necessary to answer questions about a watershed at a range of scales relevant to many sectors of society such as: water quality, long-term trends, non-point source pollution, watershed conservation, restoration projects, infrastructure planning, erosion and weathering processes, or land-use impacts.

Planning:



This project is a collaborative effort between ANP, FOA and COA initiated by COA student, Will Minogue. We chose gage sites that align with our collective goals (Cromwell Brook at Park Look Rd Site; photo S. Hall).

Installing:



Each site was equipped with a camouflage box containing the gaging equipment donated by the USGS Water Science Center, Tampa, FL (Cromwell at Sieur de Monts Site; photo S. Hall).

Calibrating:



During April and May, discharge measurements were made weekly on each stream in order to establish a rating curve (see below) relating stage height to discharge (photos by A. Wolf and S. Hall).

Teaching:



Students were instructed how to measure discharge in order to prepare for long-term data collection and care of the sites. (photo C. McCarthy-Edwards).



View upstream from Mill Brook Gage



Monitored Watersheds: Eastern MDI

Watersheds listed north to south:

Mill Brook: Small part of basin within ANP, mostly residential/farmed, adjacent to COA-owned properties (including a farm with livestock)

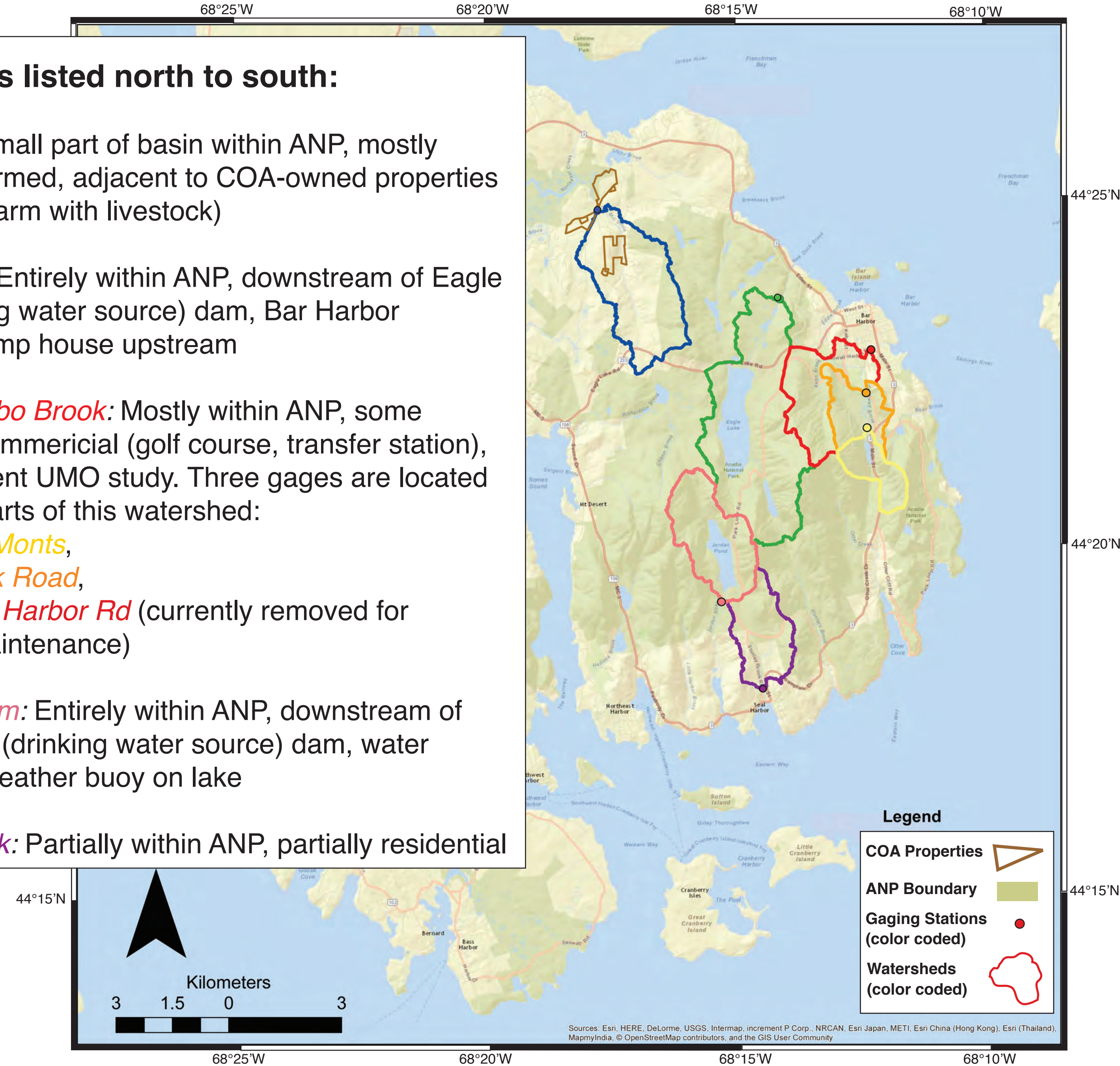
Duck Brook: Entirely within ANP, downstream of Eagle Lake (drinking water source) dam, Bar Harbor Municipal pump house upstream

Cromwell/Kebo Brook: Mostly within ANP, some residential/commercial (golf course, transfer station), focus of current UMO study. Three gages are located in different parts of this watershed:

Sieur de Monts, Park Look Road, Cromwell Harbor Rd (currently removed for bridge maintenance)

Jordan Stream: Entirely within ANP, downstream of Jordan Pond (drinking water source) dam, water quality and weather buoy on lake

Stanley Brook: Partially within ANP, partially residential



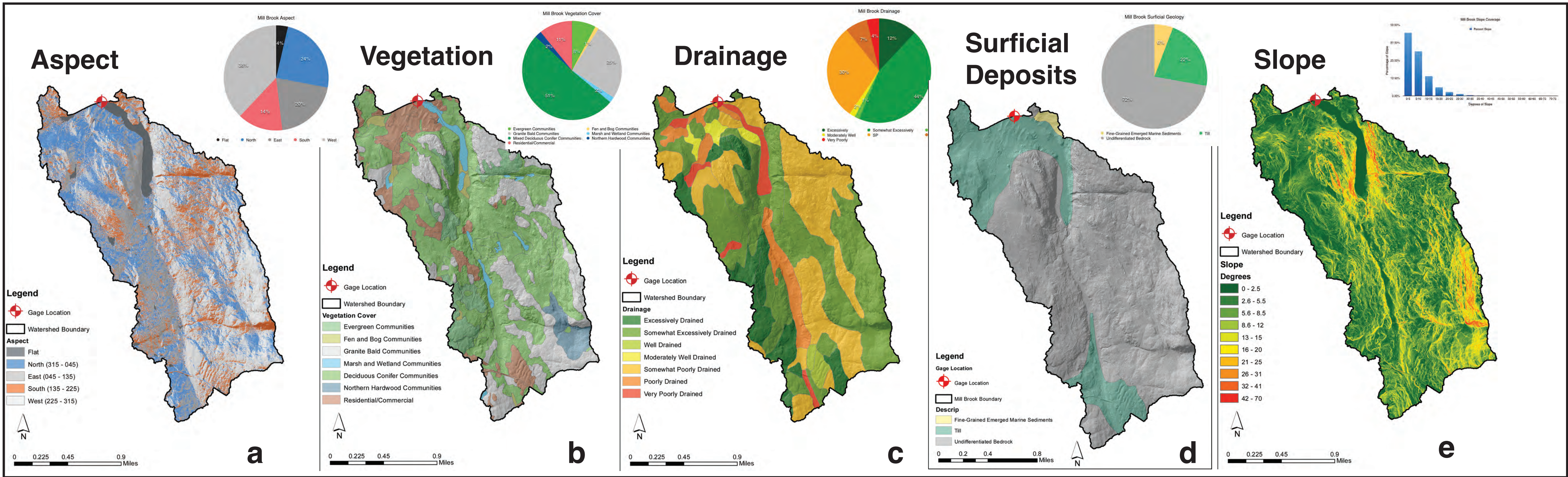
Site Components: example, Mill Brook, tributary to Northeast Creek



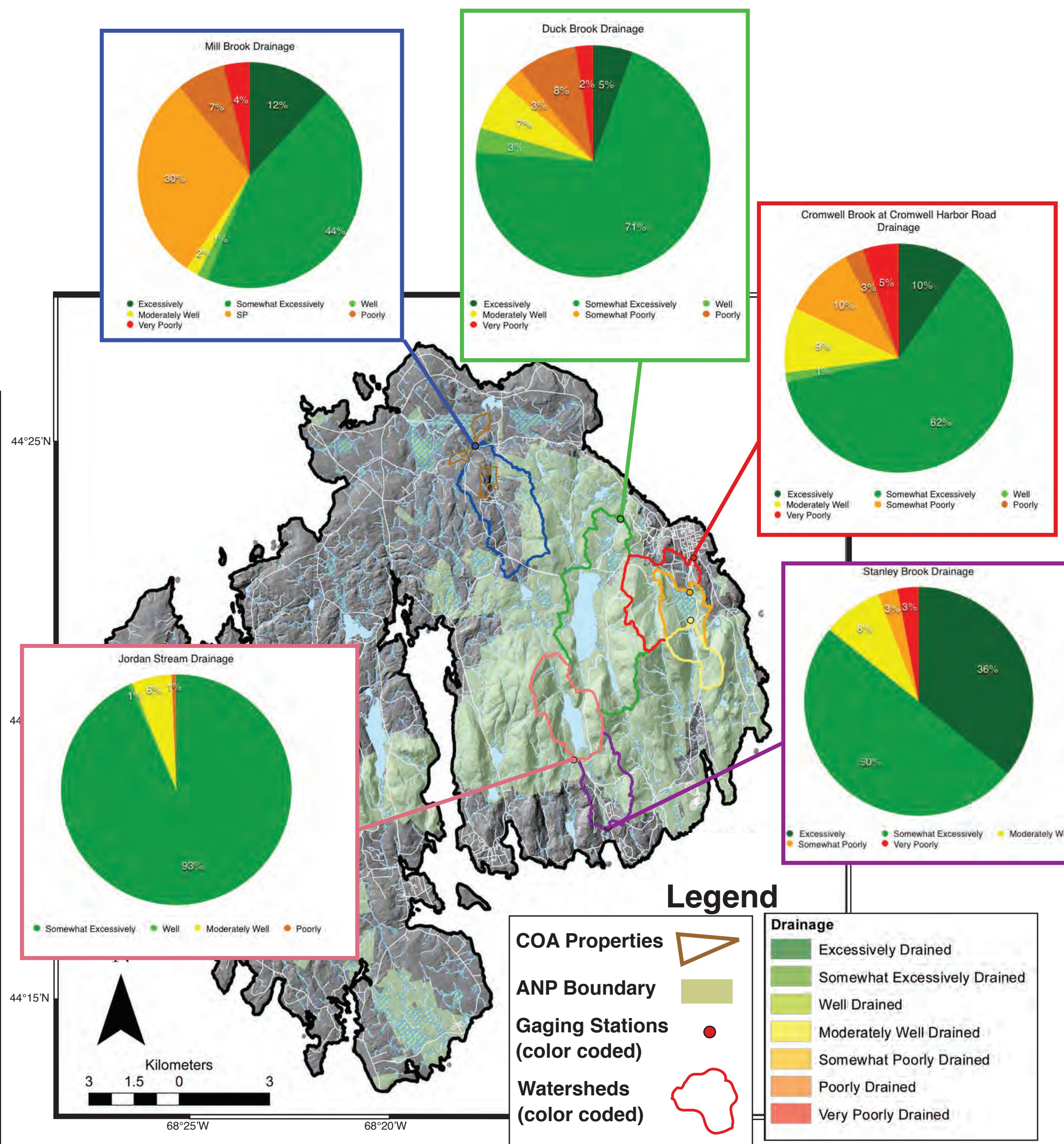
At the corner of Crooked Rd and Norway Dr (a), the camphage box blends in well with the bridge stone (b). This site is of interest to COA because it is adjacent to the COA-run farm. It is also a major tributary to Northeast Creek (photo by W. Minogue)

Equipment is mounted to the side of the bridge at a stream culvert. A camouflage pvc pipe (c) protects the tape and stills the water. A solar panel (d) fixed to the side of the aluminum box provides power to the instrument. Inside the box, is a battery, regulator, and data logger attached to the tape (e; photos by W. Minogue).

Watershed Characteristics: Using spatial data to quantify parameters in Mill Brook Basin



Drainage potential for 5 main basins:



Preliminary Findings:

We can detect small and short-lived changes in discharge related to activities within the watershed such as:

- * Culvert grate cleaning
- * Extra pumping than normal (unscheduled withdraw from lake water source)

We can see a lag in peak flow following rain events that seems to be related to basin drainage potential.

Future Directions:

- * Compile existing chemical data (including new baseline data collected in Spring 2016) to overlay with physical basin parameters in order to identify trends in chemical data.
- * Complete field based geomorphic mapping of each stream to define reaches and refine the land-use dataset.
- * Establish a system for collecting, processing, and storing data (at ANP) so that all parties and the public may access our data.

Acknowledgments:

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A Public Water Supply: Jordan Stream, outlet from Jordan Pond



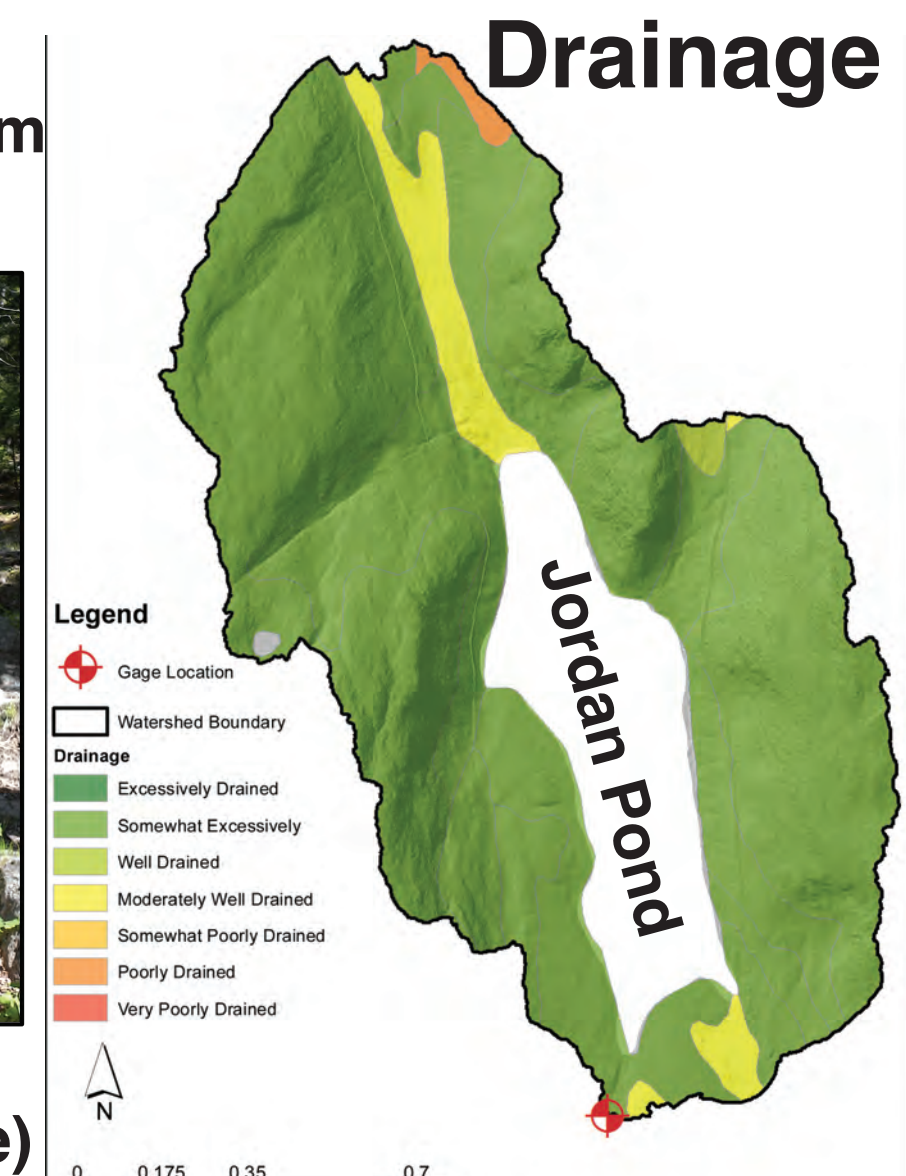
Jordan Stream Gage, downstream from lake (photo W. Minogue)



View upstream from Jordan Stream Gage (photo W. Minogue)



Jordan Pond Buoy (<http://www.jpbuoy.com/>)



Jordan Stream originates at the dam outlet of Joran Pond. When lake levels are low, very little water can pass over the top of the dam resulting in low or no flow in the stream. Supplementing discharge measurements, ANP staff regularly collect field parameters and water samples (nutrients) at this site. The Jordan Pond Buoy collects and reports water quality and weather data in 15 min increments as well.

Discharge and Precipitation

