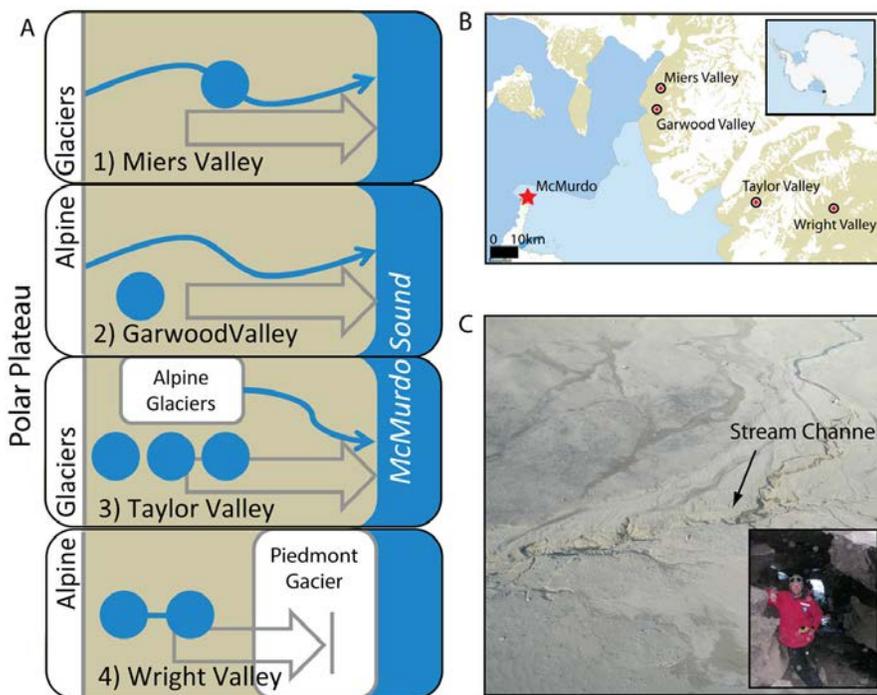


## New monitoring and Lake, Stream, and Soil Research – Byron Adams and Berry Lyons

One of the most ambitious expansions of MCM4 is the establishment of monitoring stations beyond Taylor and Wright Valleys, into Miers and Garwood Valleys. The addition of these two unique valley systems is a natural complement to investigating the role that topological variation plays in biogeochemical processes (H3), and provides insight into the potential future conditions in Taylor Valley.

Prior to this proposal the aquatic studies of MCM-LTER were focused on the closed basin lakes in Taylor Valley. Because these lakes have no outlets, the high solute concentration influences many in-lake processes. Lake Miers is the major flow-through lake in the MCM system and by monitoring both the inflow and outflow streams, we will be able to determine to what extent the lake is a biogeochemical reactor under more dilute conditions and at what rate various solutes are removed. The Garwood system is also much different than the Taylor Valley ones as the valley itself is underlain by large amounts of buried ice that can impact both the geochemistry and the hydrology of the system. In addition, Garwood Stream flows directly into the ocean, and provides an assessment of direct terrestrial-marine connectivity in the MCM region.



(A) Changes in connectivity mediated by geographic variation among valleys: 1) aeolian (gray arrow) and freshwater fluxes interact with flow-through lake, 2) aeolian and freshwater fluxes **from distal** sources carried by a large stream, 3) aeolian and freshwater fluxes from near-coast sources with closed basin lakes, and 4) piedmont glacier blocks all but aeolian sources.

(B) Location map of MDV

(C) Thermokarst erosion of Garwood Stream after a warm summer hydrological pulse event.

New monitoring experiments established here include meteorological stations, stream gauges, algal transect sites, lake stations, elevational transects (soil), aeolian material fluxes, focused sampling along environmental gradients, soil active layer monitoring, mass flux quantification and metagenomic analyses of samples associated with nearly all of these activities.

