Issues

* Cation exchange with salt sprayed on road
* Natural causes: wildfires
  + Determine # years fires can have impact on metal concentrations in system
* Analysis from river recon outing-lots of roofs/ELPs along mainstem
* Impervious surfaces adjacent to
  + Reference traffic data along sterling hwy, etc…. (compare summer vs winter)
* Create table depicting effects on juvenile, adult salmon
* Culverts??
* Determine effects of glacial melt: do metals have different effects/behave differently in glacial waters (bind to sediment?)
* Determine effects of flow on metals—dropping out sooner in slower systems?
  + What types of soils do metals bind more readily to?
* Imperfect stormwater systems
  + Interesting: <https://news.wsu.edu/2018/02/12/salmon-double-whammy-stormwater/>
  + <https://wsg.washington.edu/saving-salmon-from-roadway-runoff/>
* Look into copper/zinc in volcanic ash….

Solutions

* Local green infrastructure programs-reference other Alaskan programs already established
  + Rain gardens, education programs, presentations, hands-on learning
  + Develop list of native Alaskan plants effective at phytoremediation in riparian, upland settings
  + <https://copperriver.org/programs/dont-run-off-salmon/how-does-stormwater-run-off-affect-rural-communities/>
* Work with WWTPs to improve outflow filtration?
* Determine alternatives to spraying salt on roads (cation exchange….)
  + Avoid spraying on/near bridges? Buffers at road crossings?
* Additional sampling
  + Soil testing or metal testing in transects?
    - Contact geologists-local?
  + Intensive monitoring before/during/after heavy rain or snowmelt event in tributary(ies) displaying high concentrations of metals to determine the % increase in concentrations related to rains/melt
* Develop impervious surface shapefile; where/how much water flows into tribs/mainstem KR; consider groundwater flow
  + Sample at these influx locations during heavy rain
  + Test puddles/other accumulated water on large parking lots
  + Encourage the
  + Work with municipalities to improve their stormwater system
  + Drainage from Kenai/Soldotna Airports?