Grand Canyon Intervening Flows

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Description

This is an R Markdown document. This document uses the USBR Natural Flow Database (1907 to 2016) to show Grand Canyon Intervening Flows from Lake Powell to Lake Mead. Included are:

1. Paria River
2. Little Colorado River
3. Virgin River
4. Seeps, springs, etc. into the Colorado River

Three plots show: 1. Box and whiskers of total intervening flow 2. Correlation of Grand Canyon intervening flows to Lee Ferry natural flow 3. Sequence Average plot of intervening flow using code of Salehabadi and Tarbotton (2020)

Findings (Recommendations in bold)

1. Grand Canyon tributary flows are commonly discussed as 0.8 to 1.0 maf per year. The lower value is consistent with the historical record of 1906 to 2016.
2. Flows since 2000 have been 0.3 maf per year lower (on average). More like 0.5 maf per year.
3. There are 4- and 5- year sequences, including since 2000, when tributary flows were lower still, such as 0.25 maf per year.
4. Grand Canyon intervening flows are a critical component of inflow to Lake Mead and their variability should be considered in Lake Mead operations.

Requested Citation

David E. Rosenberg (2021), "Grand Canyon Intermediary Flows." Utah State University. Logan, Utah. https://github.com/dzeke/ColoradoRiverFutures/tree/master/ICS

References

Homa Salehabadi and David Tarboton (2020), "Sequence-Average and Cumulative Flow Loss Analyses for Colorado River Streamflow at Lees Ferry." Hydroshare. http://www.hydroshare.org/resource/bbe8dffacb07458783b2e6924aa615bb.

Figure 1. Grand Canyon intervening flow as a Box and Whiskers plot

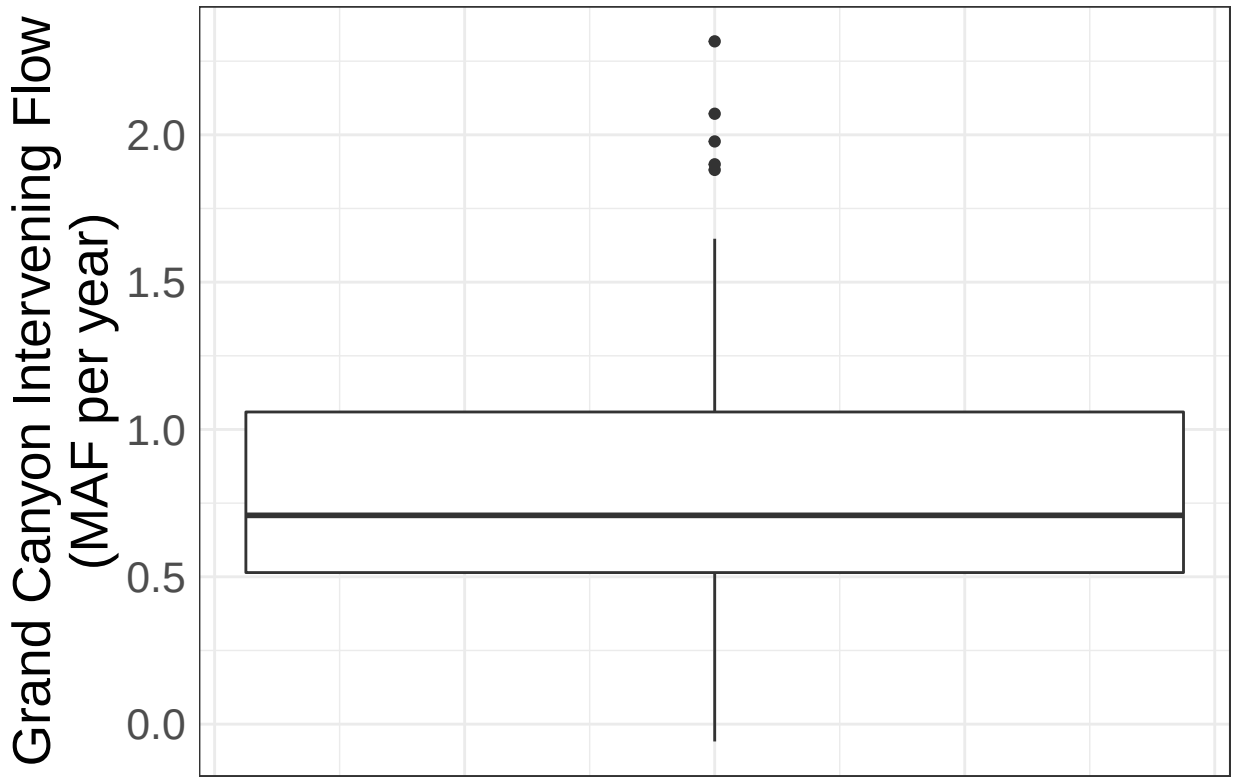
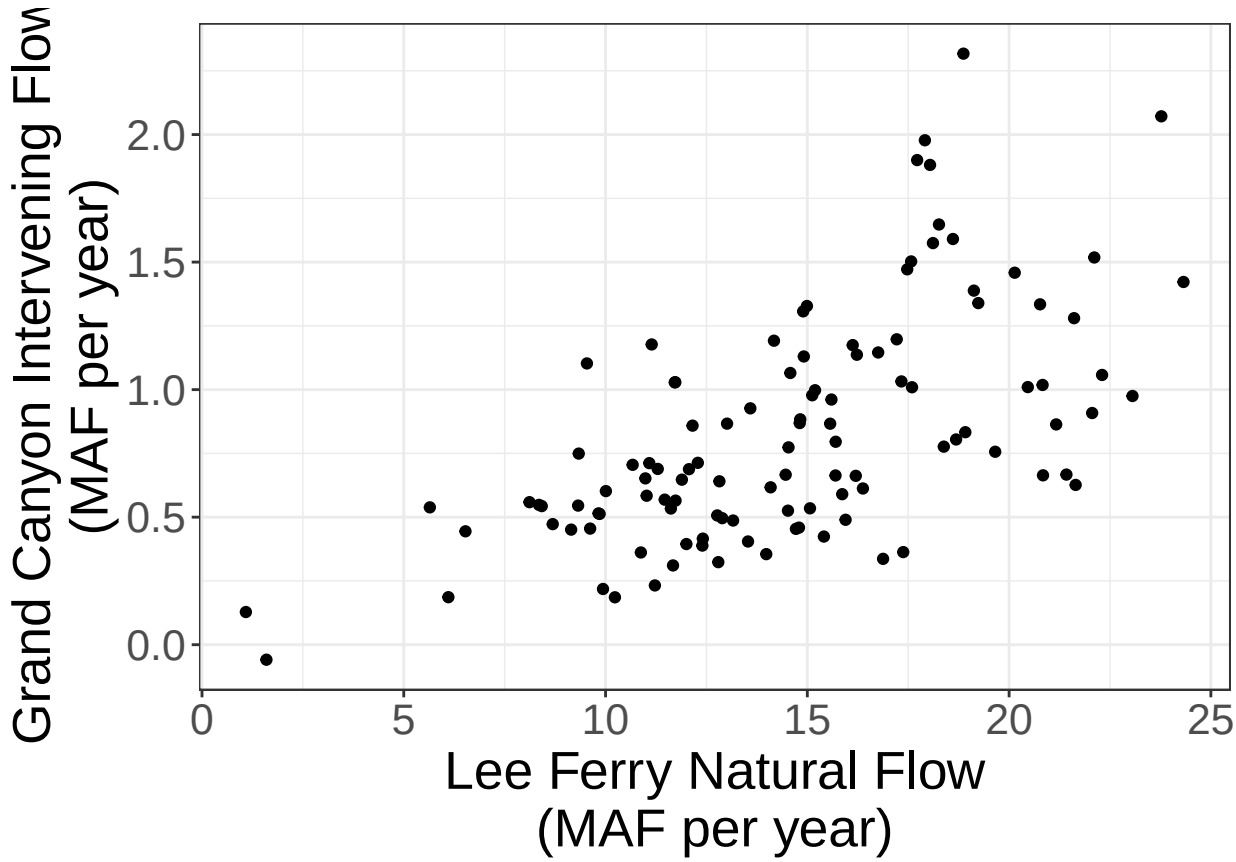


Figure 2. Correlation between Grand Canyon intervening flow and Lee Ferry natural flow

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## [1] "Correlation =  0.62"
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Figure 3. Sequence average flows