Appendix 3

Area 06- Douglas Gardner CU Chum Salmon

Coastland

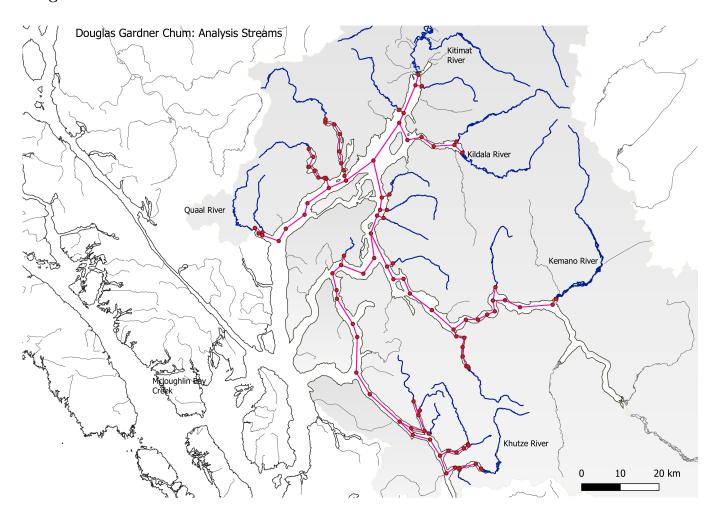
2022-12-04

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Study area

Douglas Gardner CU



Summary statistics

Bubbleplot of escapement by enhancement rank

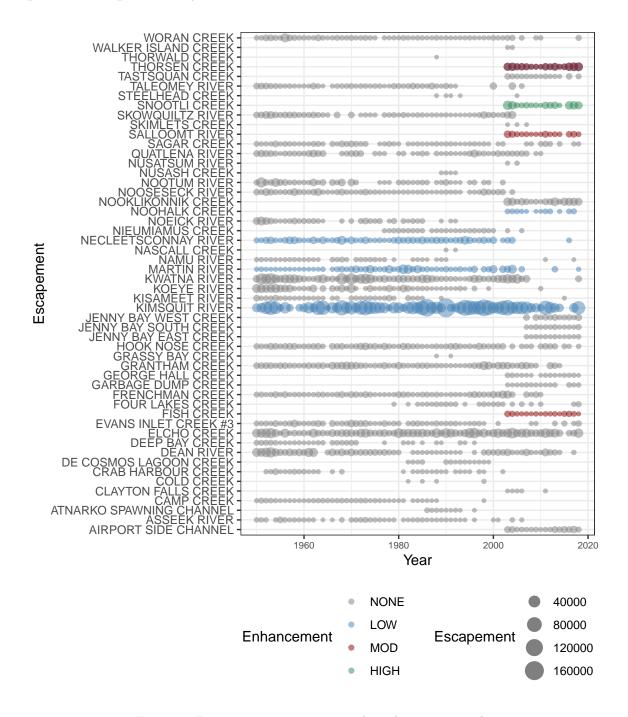


Figure 1: Escapement to area streams by enhancement rank.

Plot of total releases to area

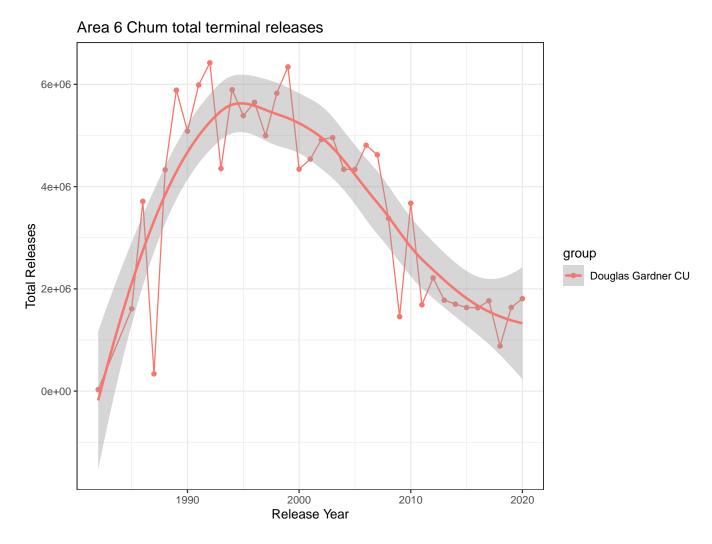


Figure 2: Total releases for area 6 (not including McLoughlin Bay)

Escapement by enhancement rank per system

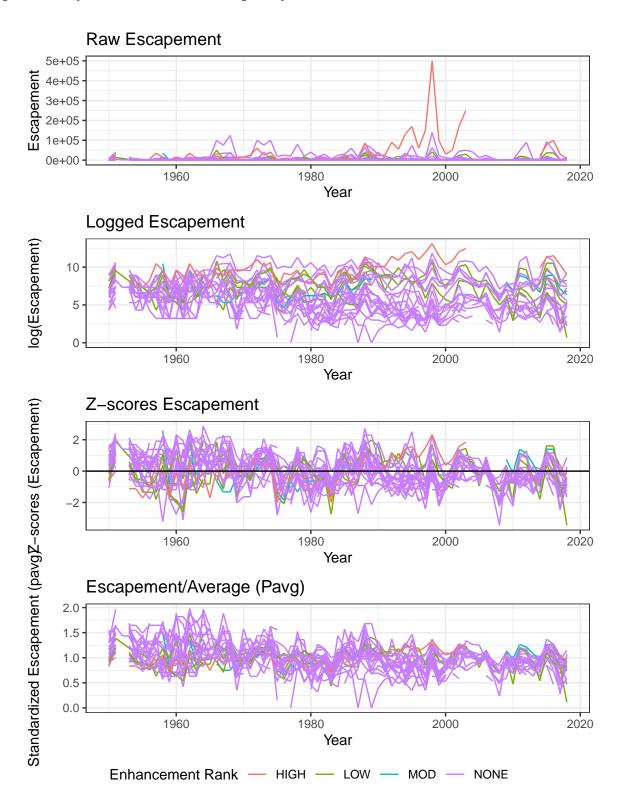


Figure 3: Various plots for escapement and transformations.

Moving average and LOESSS fit on enhancement ranking of log escapements

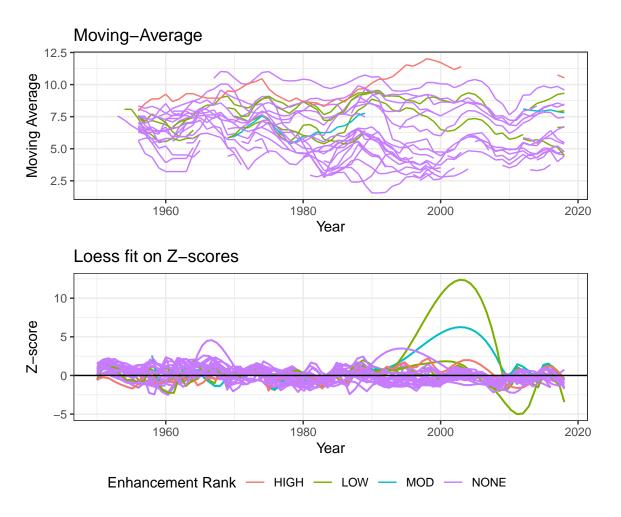


Figure 4: Moving average and LOESS fits on logged escapement by enhancement ranking.

Escapement to streams by enhancement rank

Area 6 Escapement (filtered streams) AALTANHASH RIVER **BISH CREEK BRIM RIVER CRAB RIVER** DALA RIVER **EVELYN CREEK FOCH RIVER** GILTTOYEES CREEK **HEAD CREEK** 121 HIRSCH CREEK **HUGH CREEK HUMPHRYS CREEK** 6888 2888 2888 \$888 2888 Escapement **KEMANO RIVER** KHUTZE RIVER KILDALA RIVER KILTUISH RIVER KITIMAT RIVER KITKIATA CREEK KLEKANE RIVER LITTLE WEDEENE RIVER MARMOT COVE CREEK MARSHALL CREEK PIKE CREEK QUAAL RIVER SCOW BAY CREEK WATHL CREEK WEEWANIE CREEK 1960 1980 2000 2020 1960 1980 2000 2020 1960 1980 2000 2020 Year Enhancement Level → HIGH → LOW → MOD → NONE

Figure 5: Facet plot of escapements by enhancement level

Facet plot of all releases in Area 6

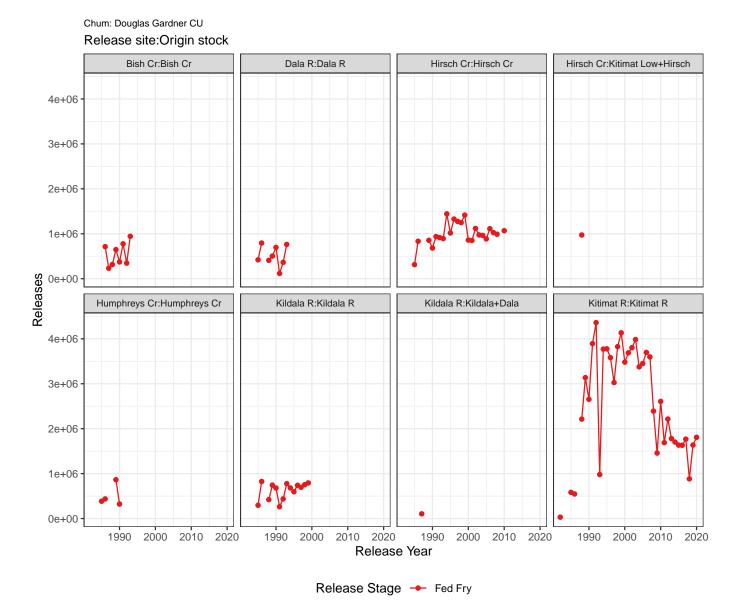


Figure 6: Facet plot of all releases in area 6

Recruits per spawner by system

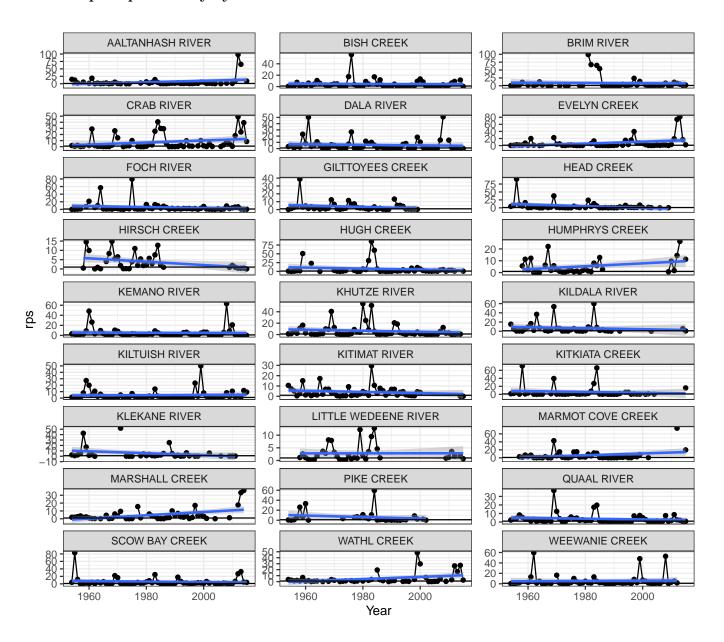


Figure 7: Recruits per spawner by system

Log recruits per spawner by system

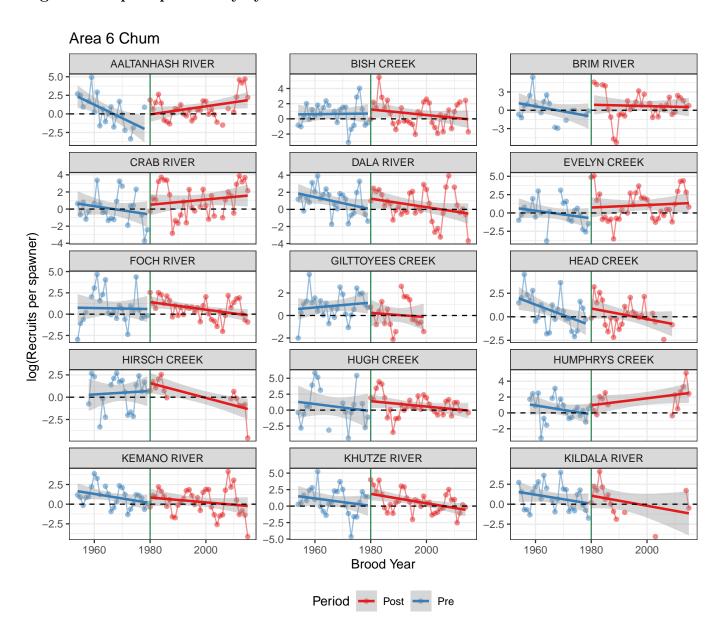


Figure 8: Log recruits per spawner by system

Boxplot of log RPS by system

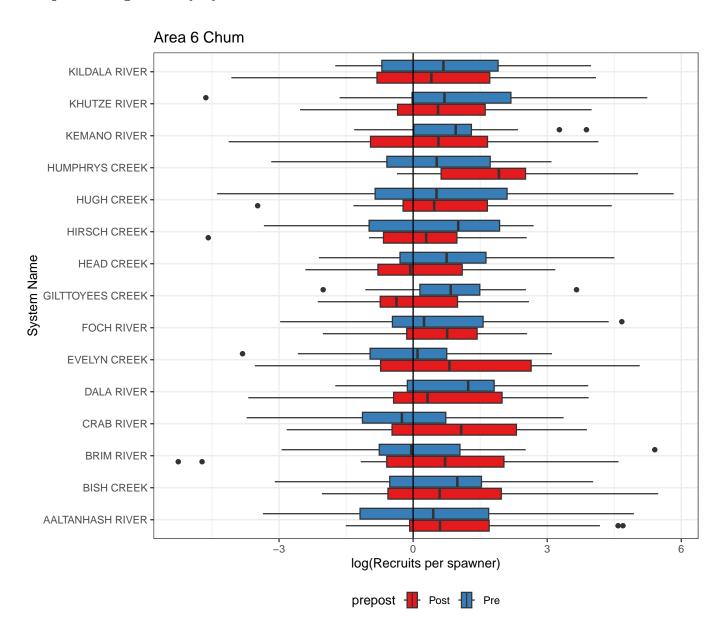


Figure 9: Boxplot of log recruits per spawner by system

Table of Douglas Gardner CU by distance from enhancement

| Stream | Dist. from enhancement |
|-------------------|------------------------|
| BISH CREEK | 11.998 |
| WATHL CREEK | 4.470 |
| DALA RIVER | 32.303 |
| KILDALA RIVER | 34.146 |
| KEMANO RIVER | 111.829 |
| BRIM RIVER | 97.710 |
| HUGH CREEK | 37.112 |
| PIKE CREEK | 41.635 |
| WEEWANIE CREEK | 39.982 |
| GILTTOYEES CREEK | 52.216 |
| FOCH RIVER | 52.191 |
| QUAAL RIVER | 65.544 |
| KITKIATA CREEK | 63.528 |
| KILTUISH RIVER | 91.658 |
| CRAB RIVER | 55.985 |
| EVELYN CREEK | 64.768 |
| MARSHALL CREEK | 133.004 |
| KLEKANE RIVER | 124.855 |
| SCOW BAY CREEK | 122.091 |
| MARMOT COVE CREEK | 117.746 |
| AALTANHASH RIVER | 132.200 |
| KHUTZE RIVER | 138.697 |
| HEAD CREEK | 132.104 |

Correlation analyses

Cross correlation plots

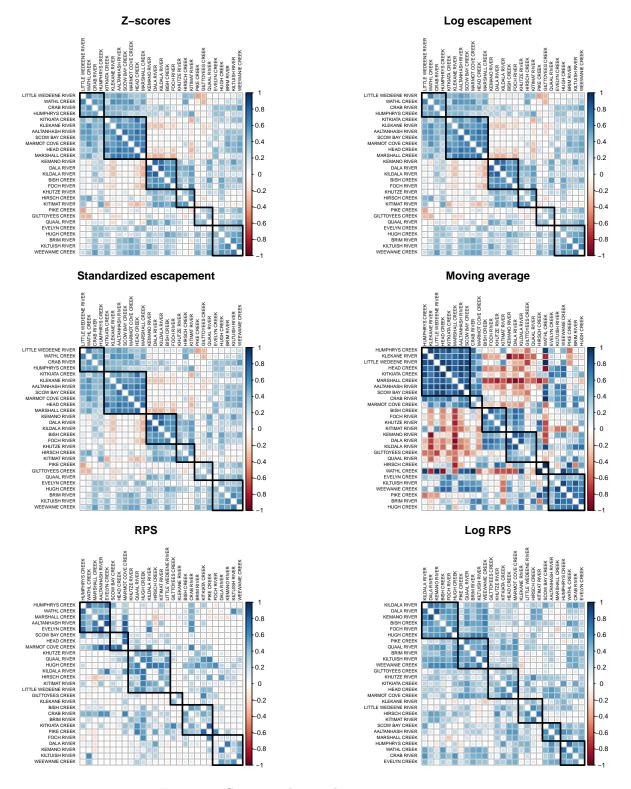


Figure 10: Cross correlation plots to compare metrics.

Dendrogram clusters analysis

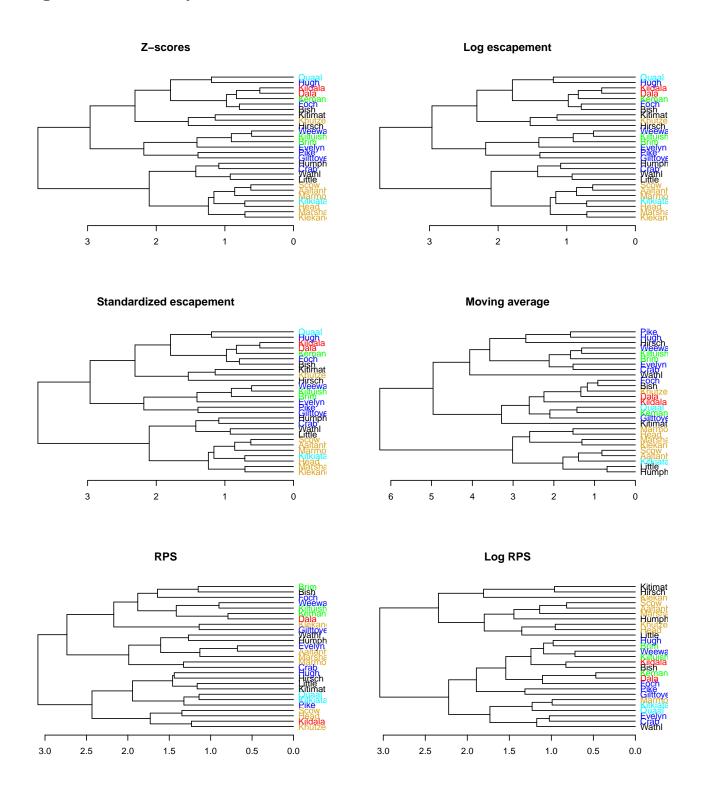


Figure 11: Dendrogram cluster analysis to compare uses of different metrics. Colours plotted by subinlet; Dala = red; Douglas = blue; Kemano = green; Khutze = yellow; Kitimat arm = black; Quaal = turquoise

Tanglegrams

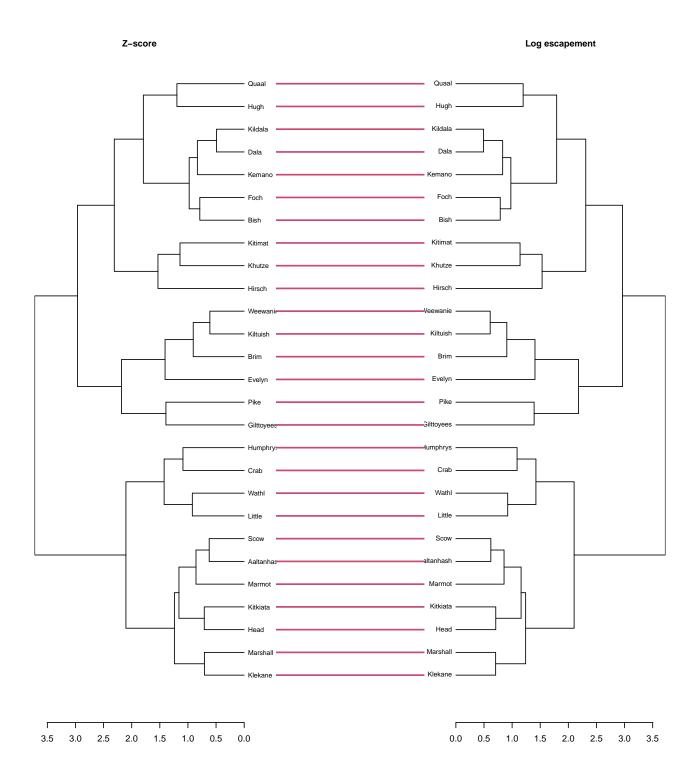
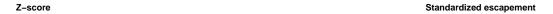


Figure 12: Tanglegram of z-score vs. logged escapements



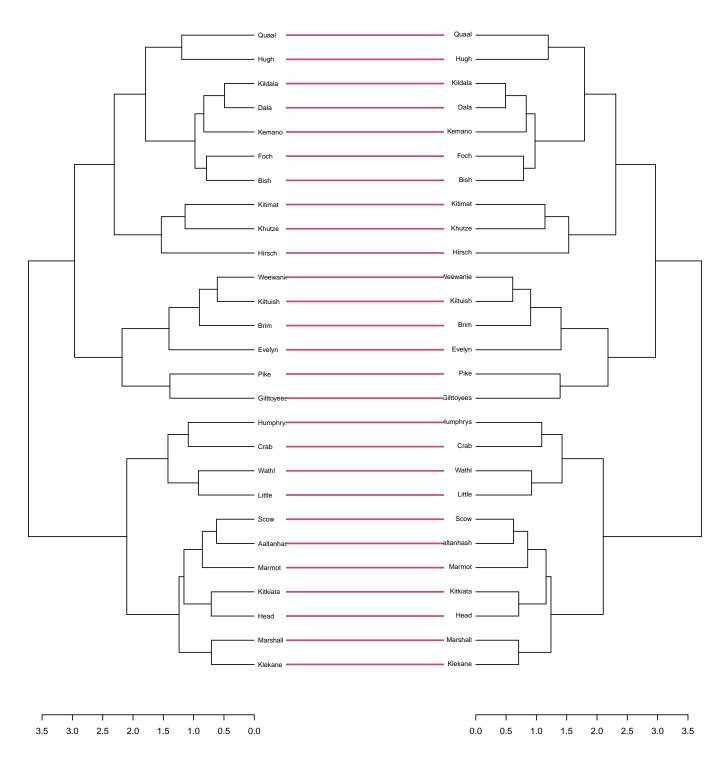


Figure 13: Tanglegram of z-score vs. standardized escapements $\,$

Z-score Moving average

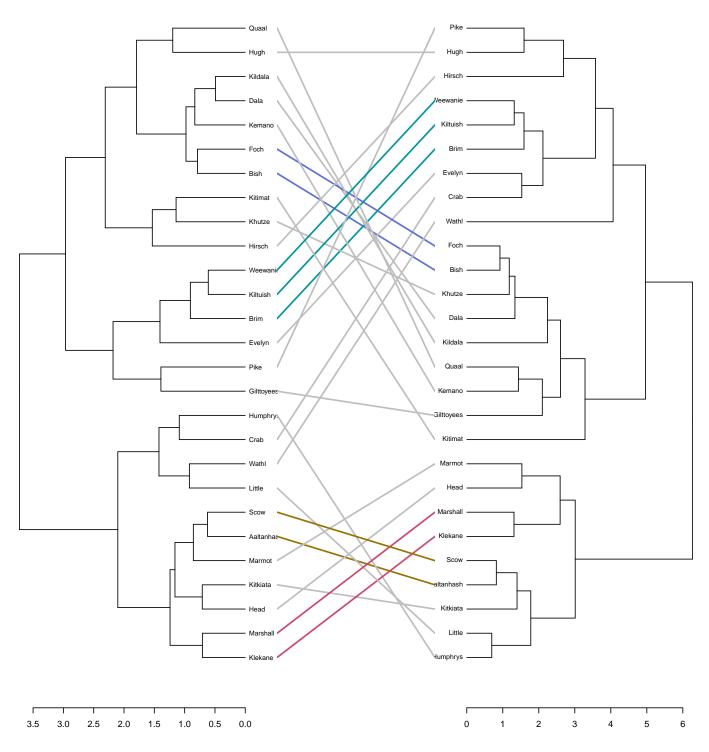


Figure 14: Tanglegram of z-score vs. moving average

Z-score Log RPS

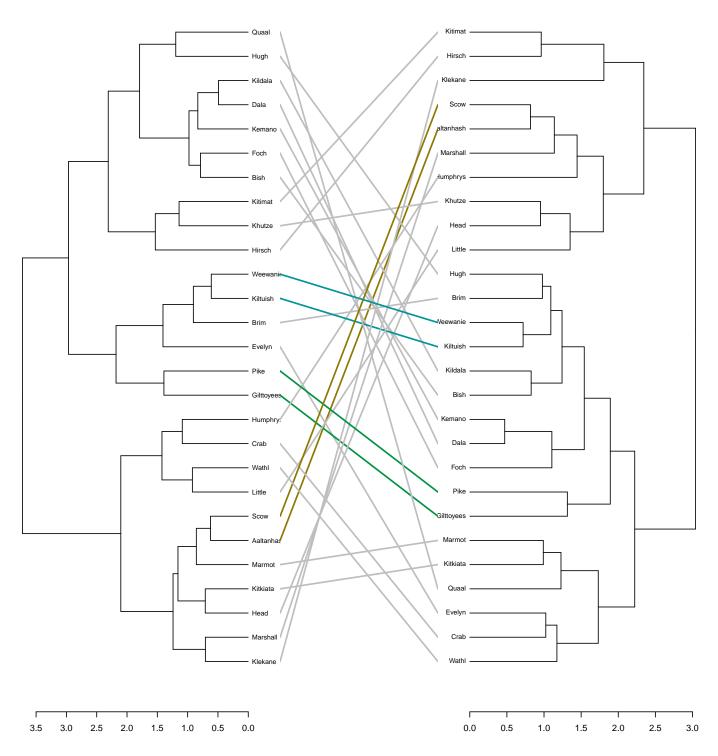


Figure 15: Tanglegram of z-score vs. Log RPS $\,$

Pre- and post-1980 correlation analyses

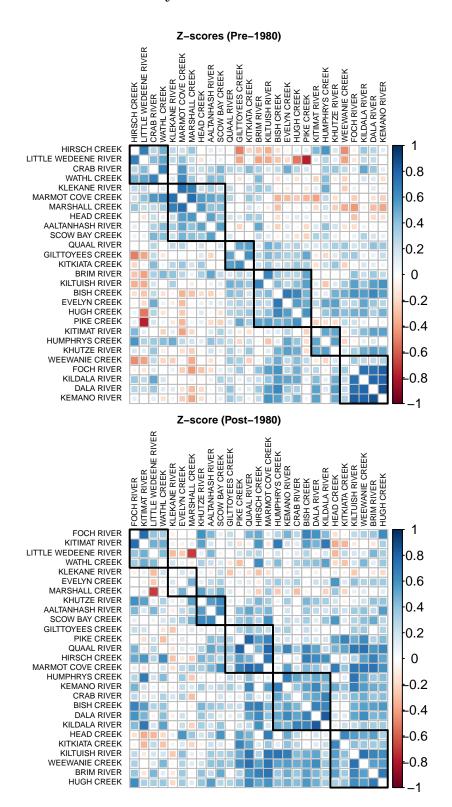


Figure 16: Cross correlation plots of z-scores to compare pre- and post-enhancement.

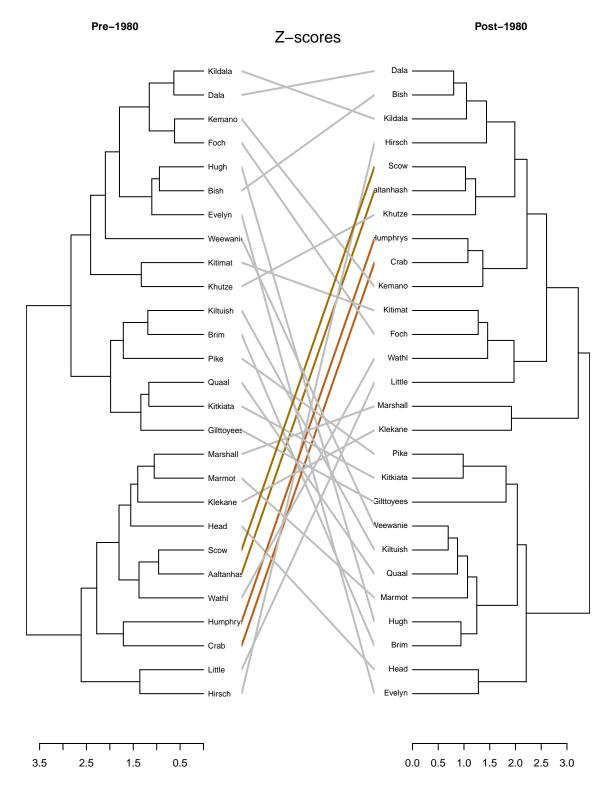


Figure 17: Tanglegram comparing z-scores pre- and post-enhancement (1980)

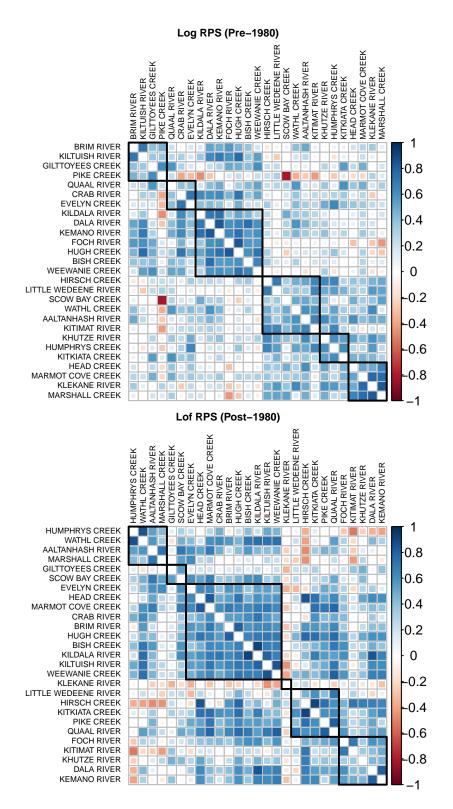


Figure 18: Cross correlation plots of Log RPS to compare pre- and post-enhancement.

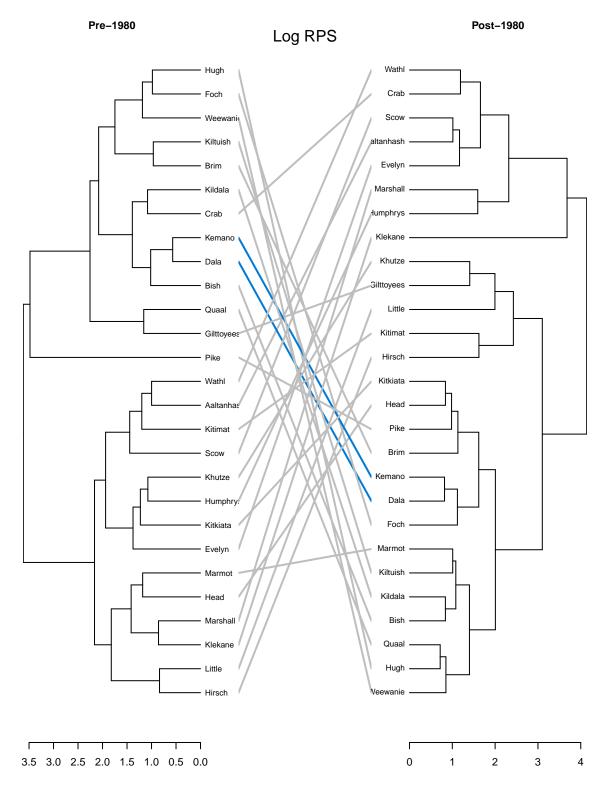


Figure 19: Tanglegram comparing Log RPS pre- and post-enhancement (1980)

Statistical models

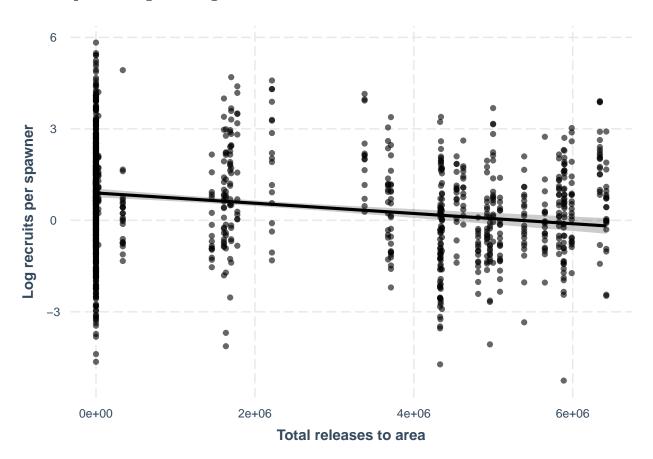
Table of log RPS candidate models and AIC selection

| Candidate model | df | AIC |
|-------------------------------------|----|----------|
| $Log RPS \sim dist + totrel + year$ | 5 | 4640.250 |
| $Log RPS \sim dist + totrel$ | 4 | 4649.087 |
| Log RPS ~ dist | 3 | 4674.840 |
| $Log RPS \sim dist + year$ | 4 | 4675.224 |
| $Log RPS \sim releases$ | 3 | 5213.524 |
| $Log RPS \sim year$ | 3 | 5237.491 |

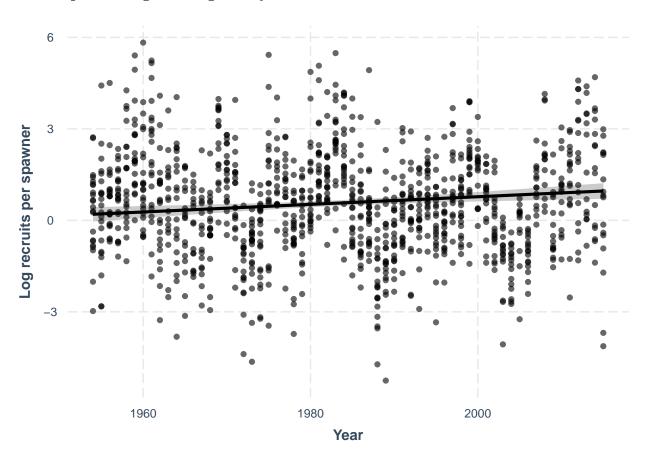
Table of log escapement candidate models and AIC selection

| Candidate model | df | AIC |
|-------------------------------------|----|----------|
| $Log esc \sim dist + year$ | 4 | 5455.093 |
| $Log esc \sim dist + totrel + year$ | 5 | 5457.085 |
| $Log esc \sim dist + totrel$ | 4 | 5468.276 |
| Log esc ~ dist | 3 | 5478.798 |
| Log esc ~ year | 3 | 6220.673 |
| $Log esc \sim releases$ | 3 | 6236.895 |

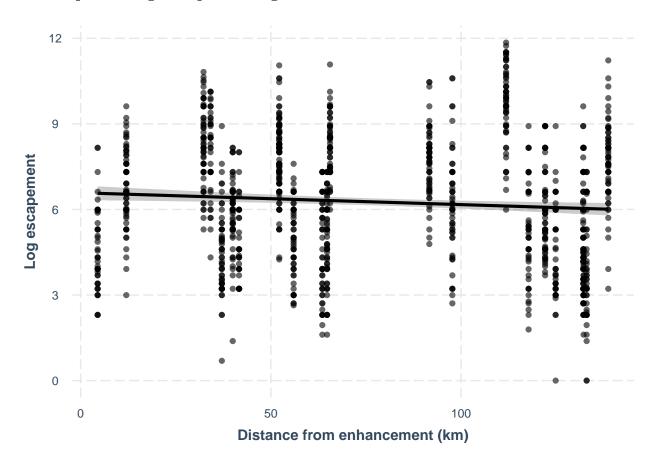
Effects plot of log RPS against releases to area



Effects plot of log RPS against year



Effects plot of log Escapement against distance from enhancement



Effects plot of log Escapement against year

