# Perennial Stream Condition in California

CRAM Results from the PSA, RCMP and SMC Monitoring Programs (2007-2015)

CALIFORNIA WETLANDS MONITORING WORKGROUP

FEBRUARY 2nd 2016

# Introduction

- With grant funding, Riverine CRAM assessments initially collected by CCWG in 2007 at 30 CMAP sites from multiple years
- In 2008 Riverine CRAM was incorporated into the PSA, RCMP and SMC monitoring programs
- Data collection has continued through 2015
- CRAM data collection for PSA and RCMP *may* stop in 2017
- PSA/RCMP data has not been worked up yet (no reports using CRAM on SWAMP website)
  - Andy Rehn is preparing a tech report on multi-indicator analysis for statewide data, comparing bugs (using the CSCI), the hybrid algae index, and CRAM.
- SMC data has been used for:
  - 5-year Regional Stream Survey Report (SCCWRP #844)
  - San Gabriel River Regional Monitoring Program 2012 Annual Report (SGRRMP #868)

Acronyms:

- PSA: Perennial Stream Assessment
- RCMP: Reference Condition Monitoring Program
- SMC: SoCal Stormwater Monitoring Coalition
- CSCI: California Stream Condition Index

CRAM
California Rapid Assessment Method

CCWG
central coast wetlands group

# Methods

- Full download of all Riverine CRAM data from EcoAtlas.org on 1/25/2016
- Removed all assessments using version prior to 5.0
- Extracted all PSA, RCMP and SMC assessments using spreadsheet provided by Raffi at SCCWRP
- Many project codes are missing
  - used the project site id and AA name to select as many correct assessments as possible
- CFDs generated for groups with n>20

EcoAtlas

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# Statewide and SMC Region Results

# Summary Statistics

RCMP:

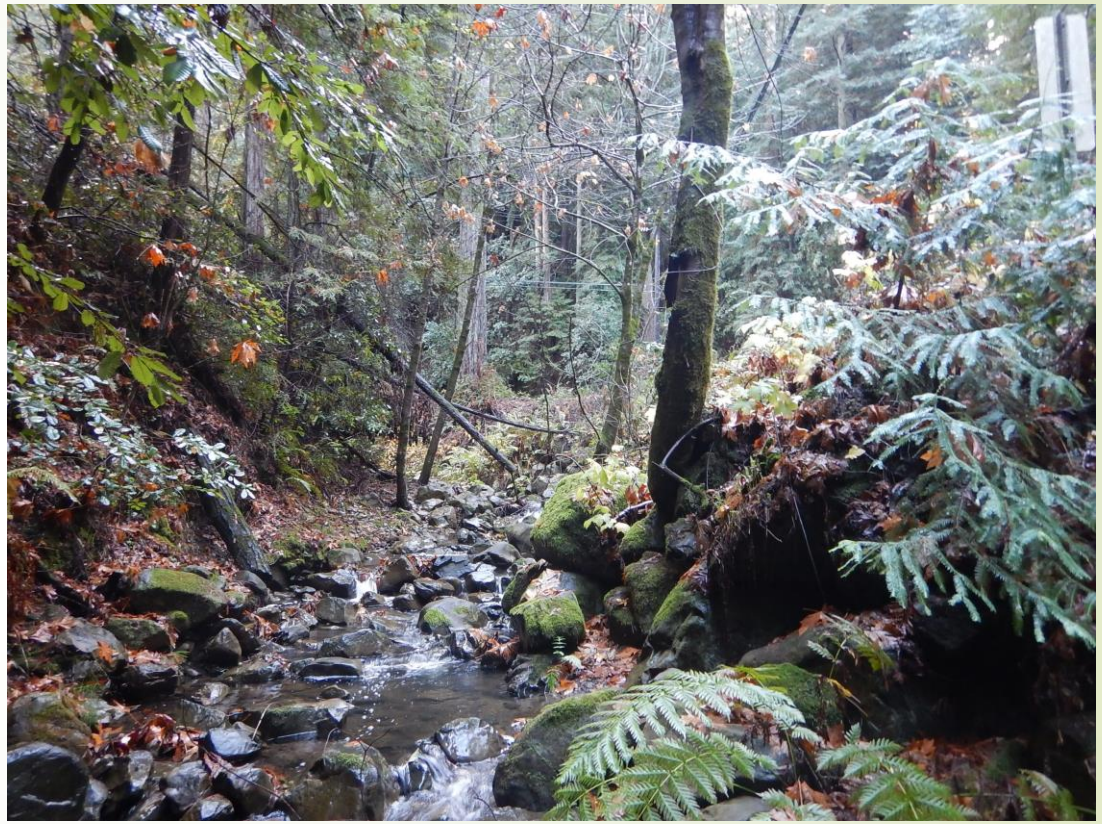
- n=302 (2008-2015)
- min score: 30 (Sac Valley)
- max score: 99 (South Coast)
- average score: 83

PSA:

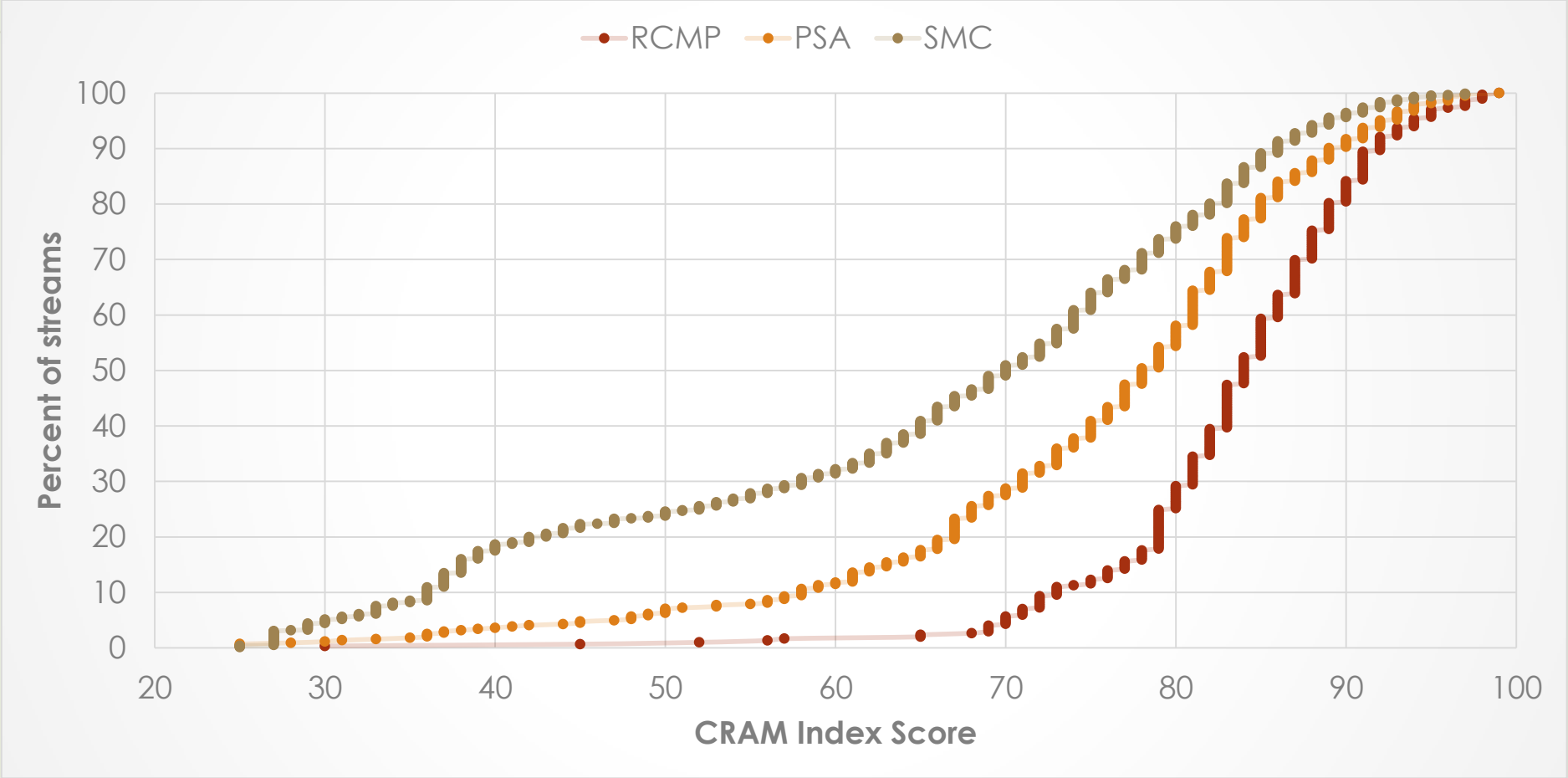
- n=443 (2007-2015)
- min score: 25 (Sierra)
- max score: 99 (Sierra)
- average score: 75

SMC:

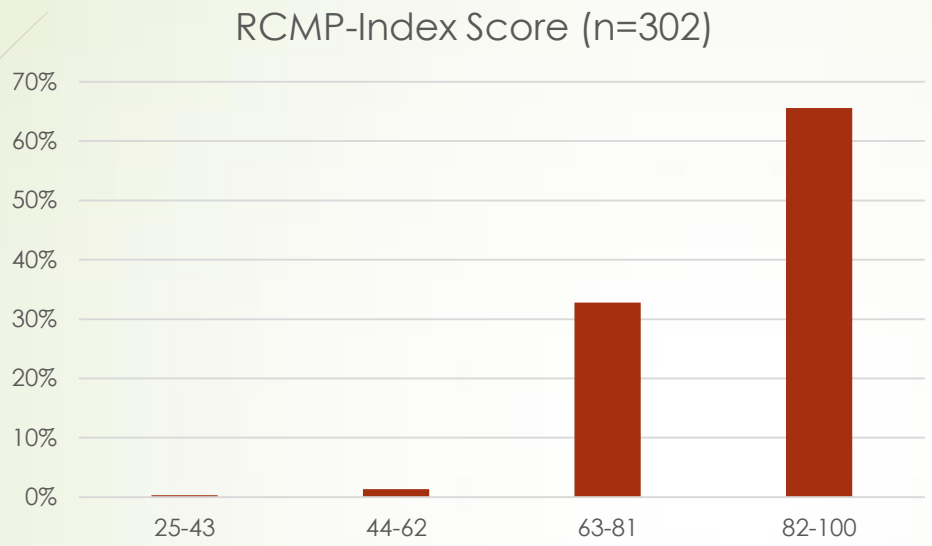
- n=827 (2008-2015)
- min score: 25
- max score: 98
- average score: 65

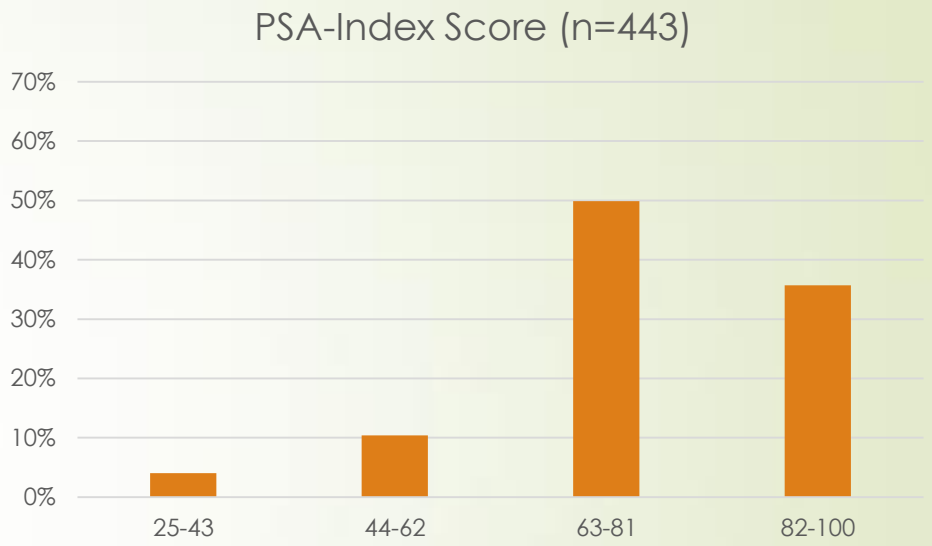


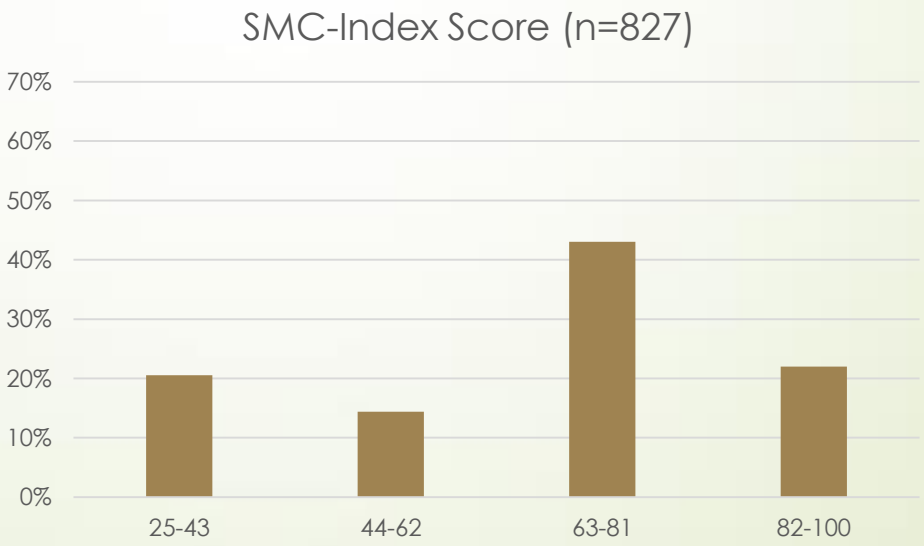
# Cumulative Frequency Distributions



# Index Scores

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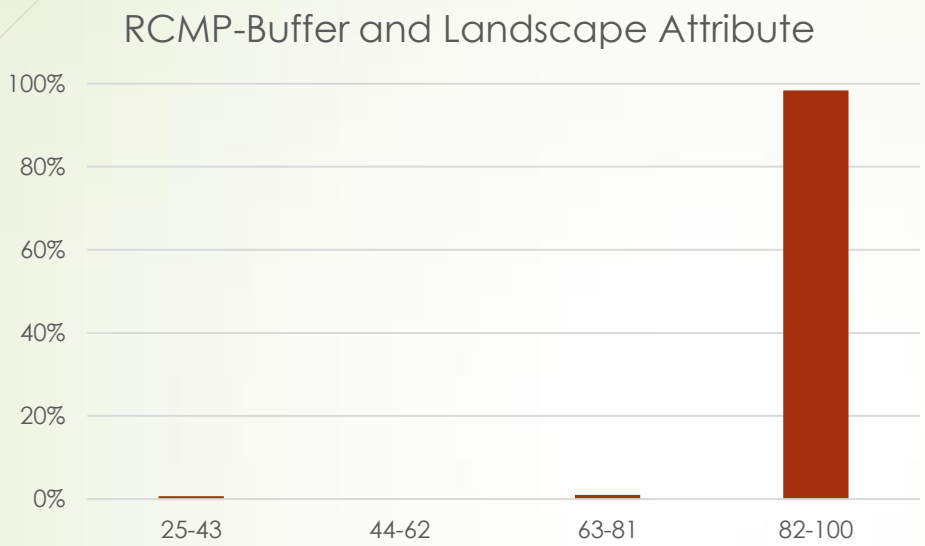
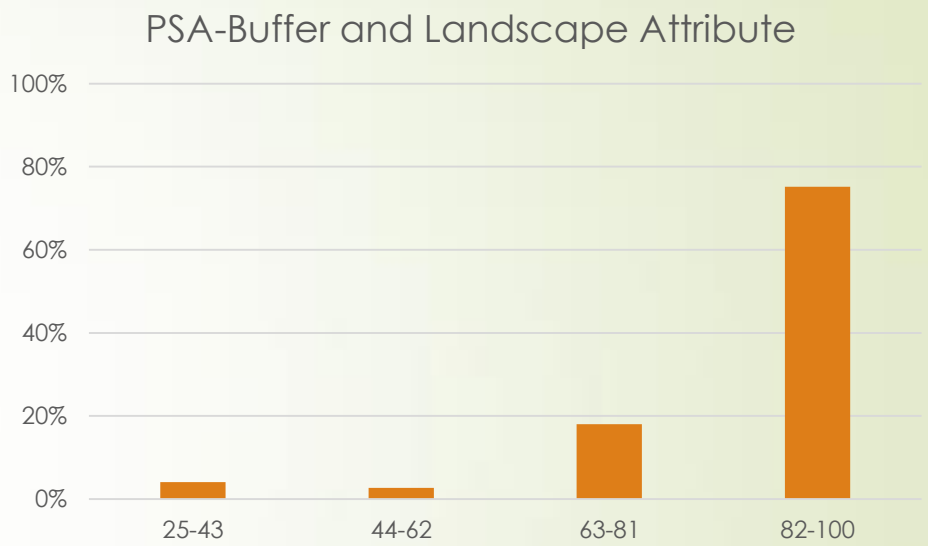
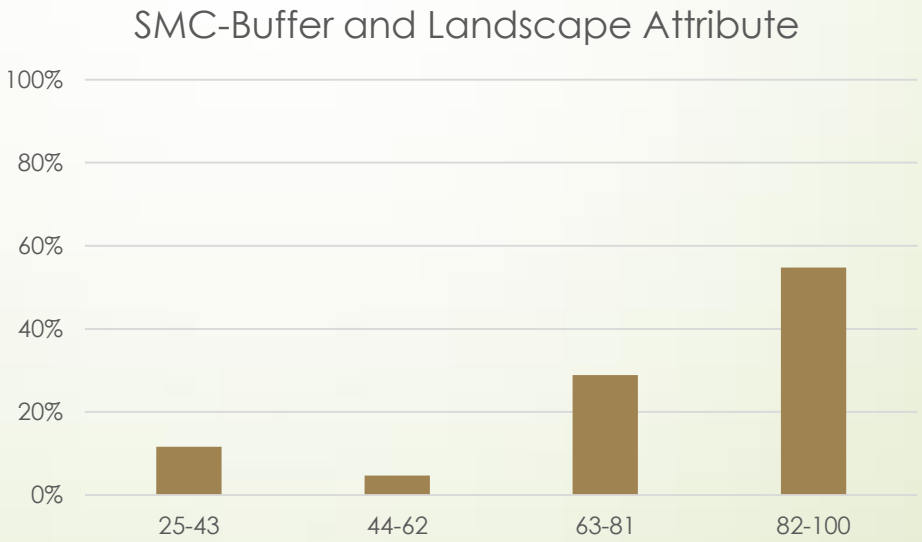
# Buffer and Landscape Context

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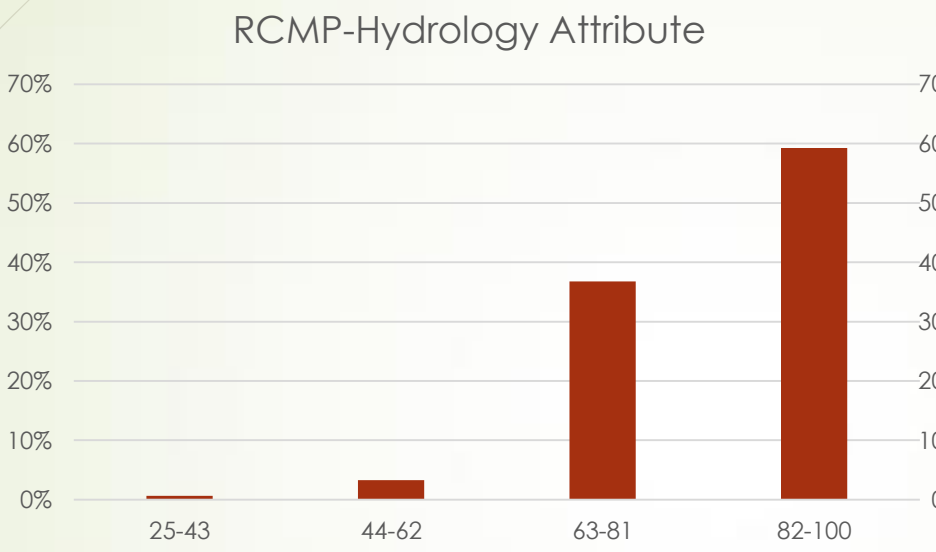
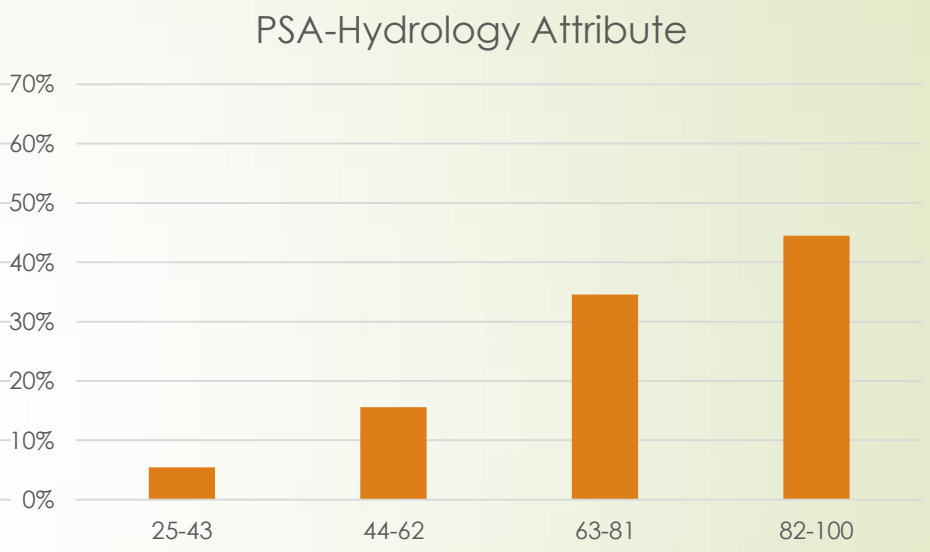
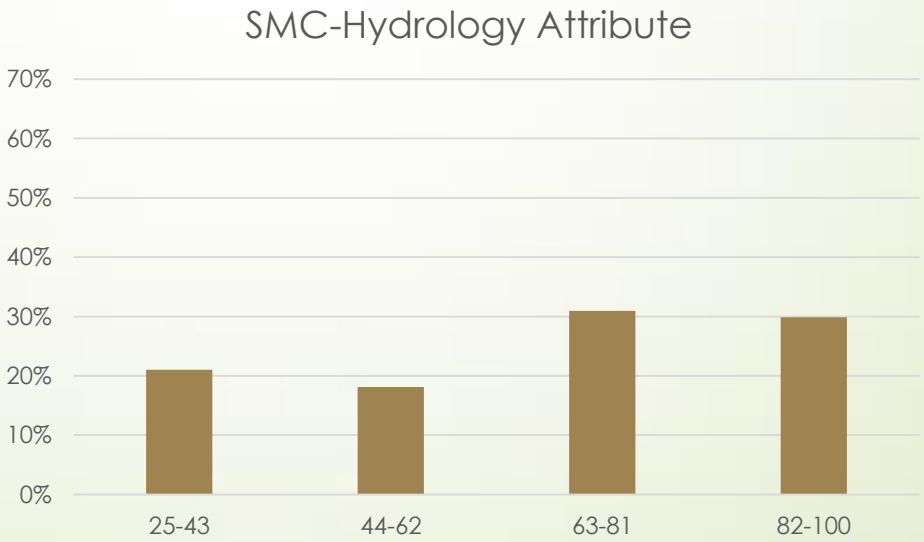
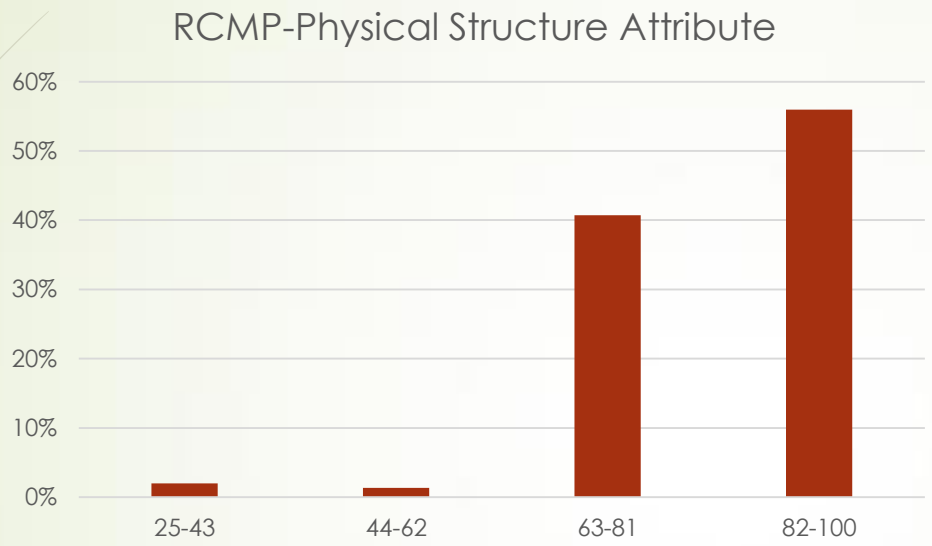
# Hydrology Attribute

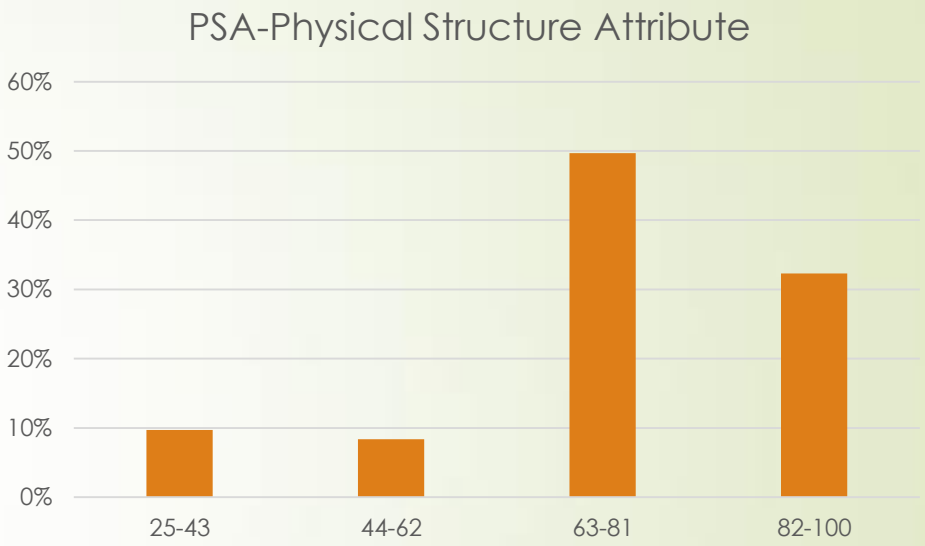


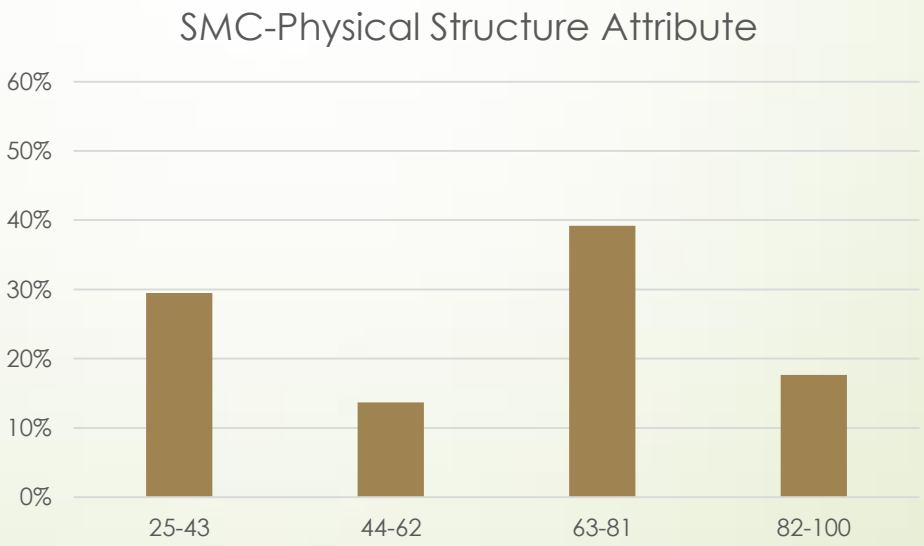



# Physical Structure Attribute

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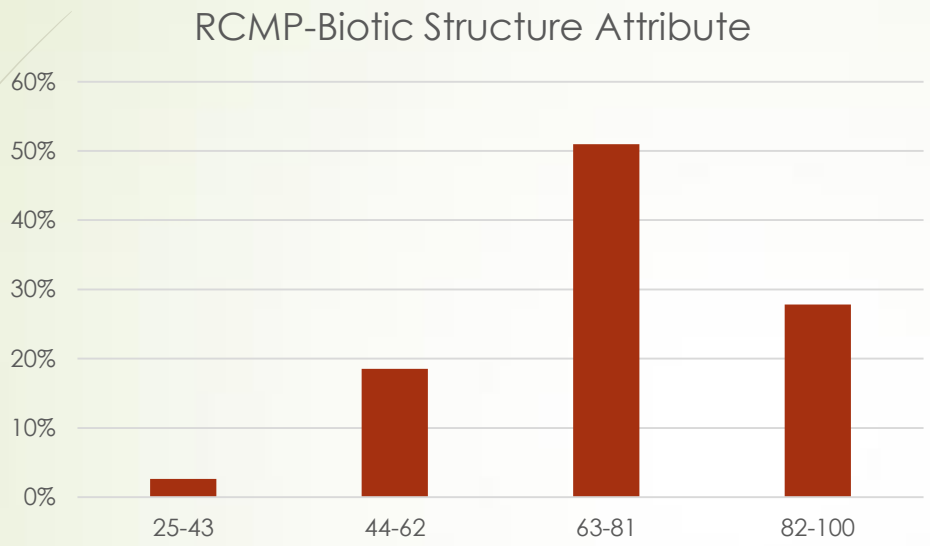
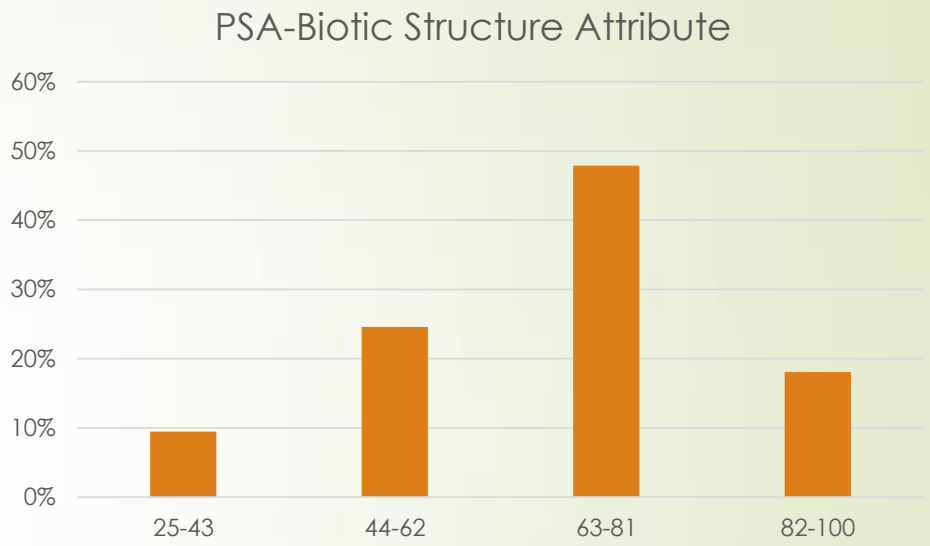
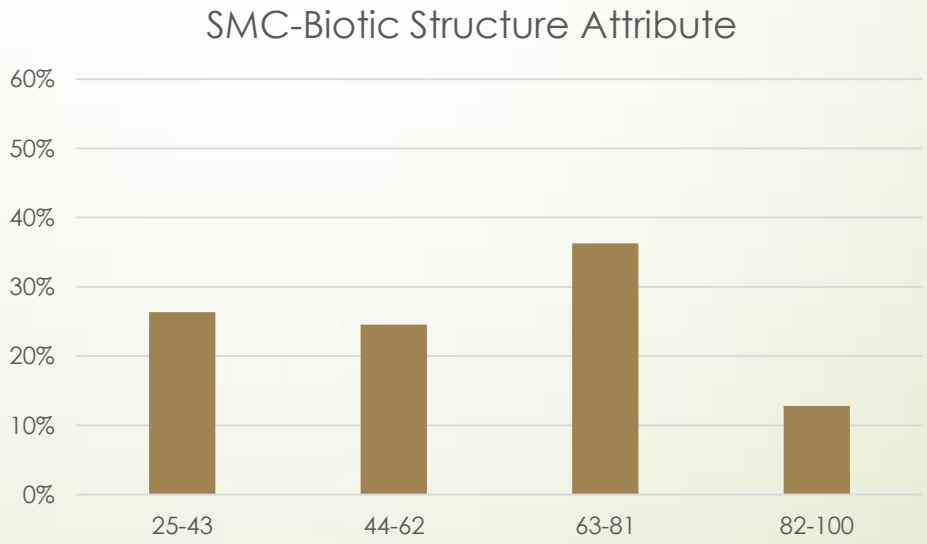
# Biotic Structure Attribute



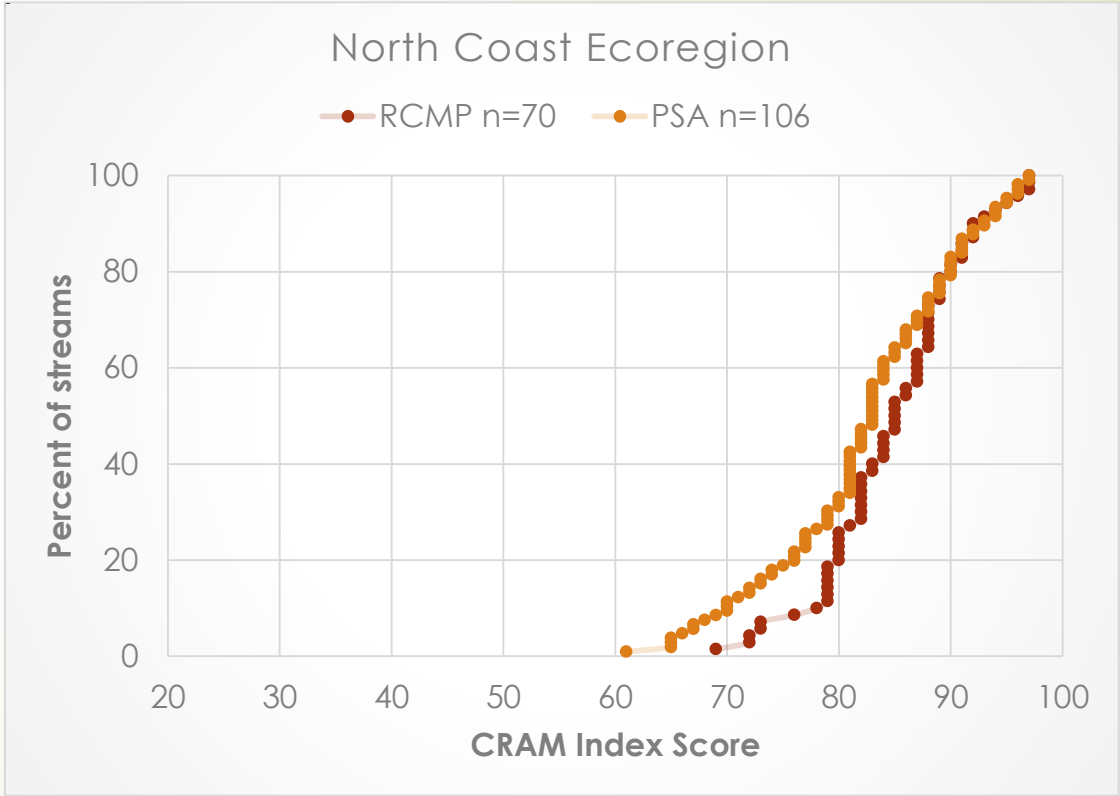



# Results By Ecoregion

North Coast, Bay/Delta, Central Coast, Modoc, South Coast, Sierra, Sacramento Valley, Mojave, San Joaquin, Colorado Desert

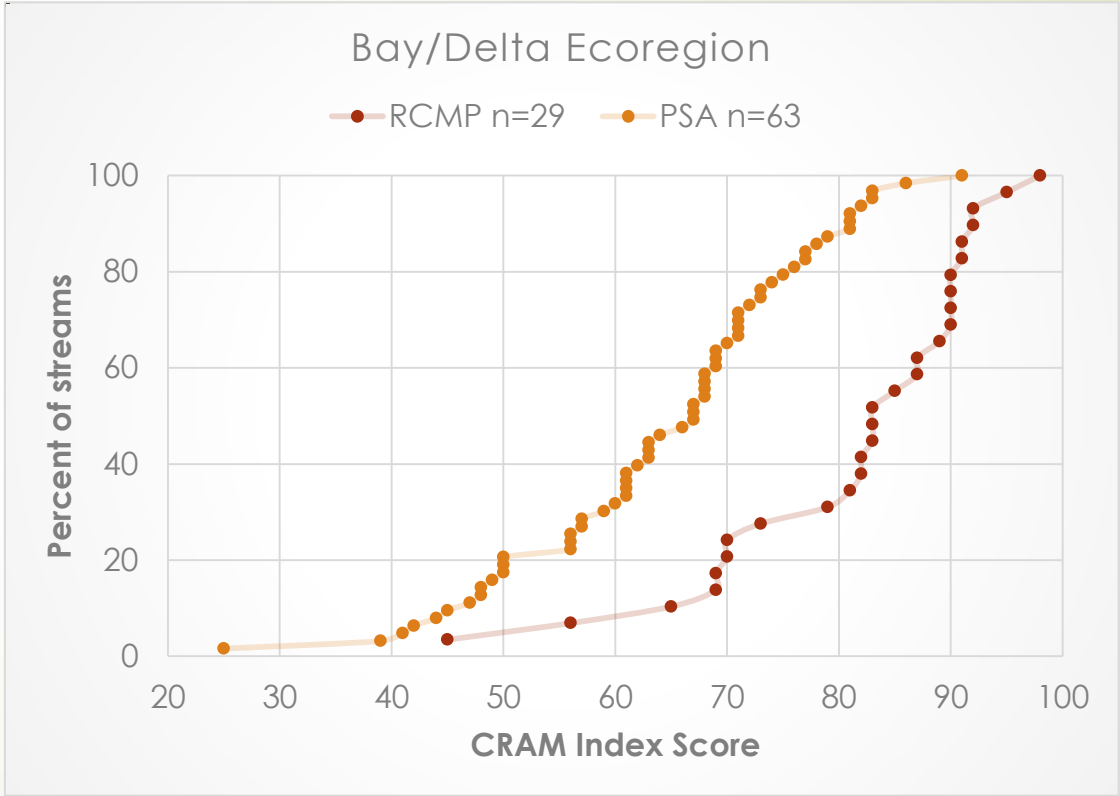
# North Coast

- RCMP Average:
  - Index: 85
  - B&L Attribute: 98
  - Hydrology Attribute: 83
  - Physical Attribute: 83
  - Biotic Attribute: 76
- PSA Average:
  - Index: 82
  - B&L Attribute: 94
  - Hydrology Attribute: 81
  - Physical Attribute: 80
  - Biotic Attribute:74



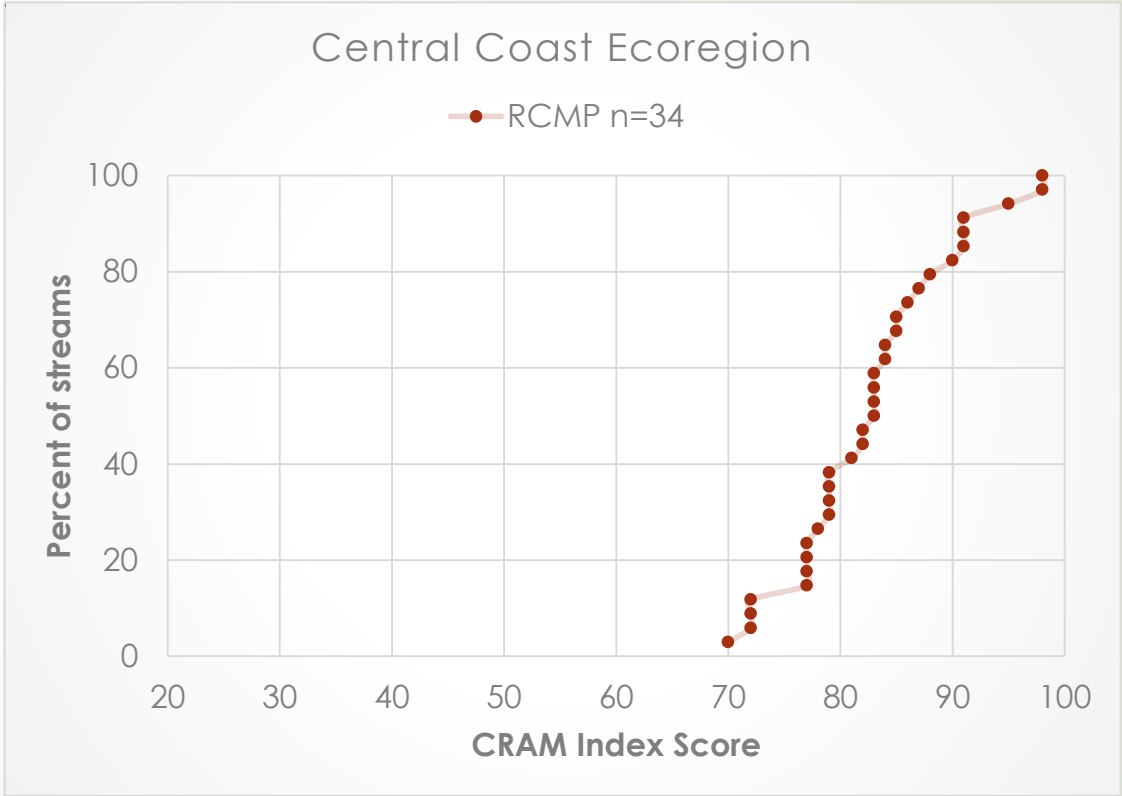
# Bay/Delta

- RCMP Average:
  - Index: 81
  - B&L Attribute: 92
  - Hydrology Attribute: 77
  - Physical Attribute: 79
  - Biotic Attribute: 77
- PSA Average:
  - Index: 64
  - B&L Attribute: 70
  - Hydrology Attribute: 63
  - Physical Attribute: 60
  - Biotic Attribute: 65



# Central Coast

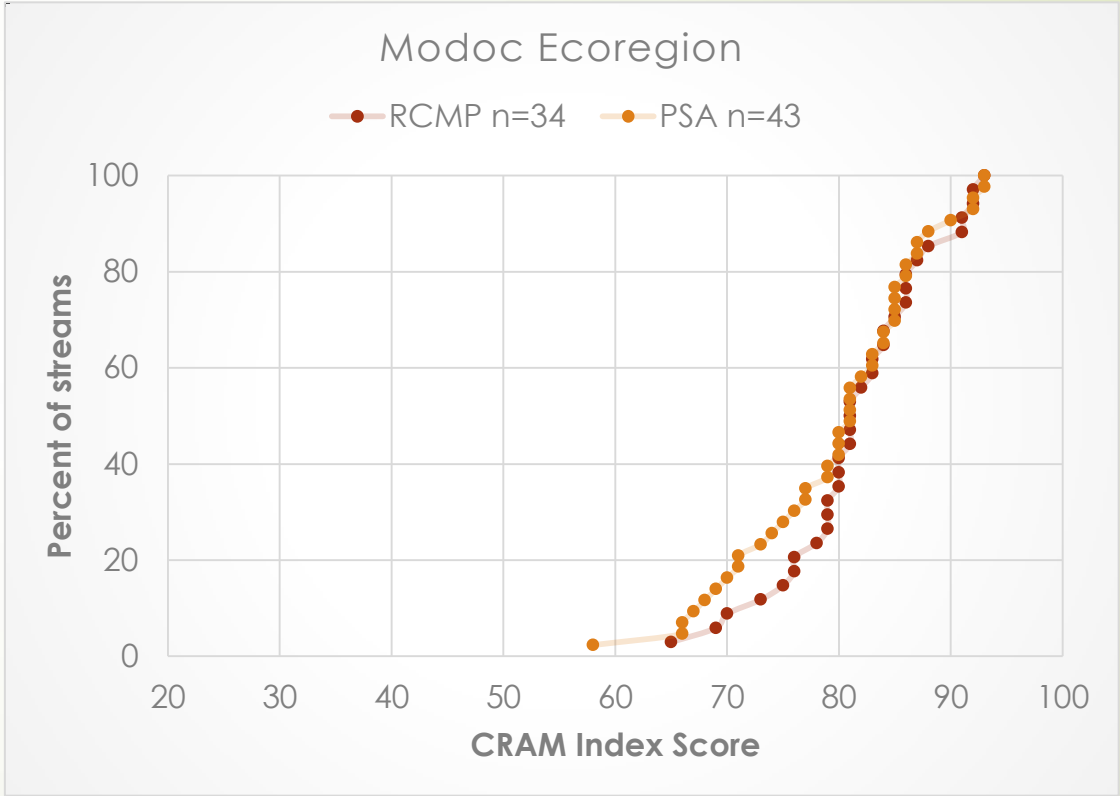
- RCMP Average:
  - Index: 83
  - B&L Attribute: 96
  - Hydrology Attribute: 81
  - Physical Attribute: 83
  - Biotic Attribute: 71
- *PSA Average:
  - Index: 77
  - B&L Attribute: 88
  - Hydrology Attribute: 77
  - Physical Attribute: 75
  - Biotic Attribute: 69




*PSA has insufficient data for CFD (n=13)

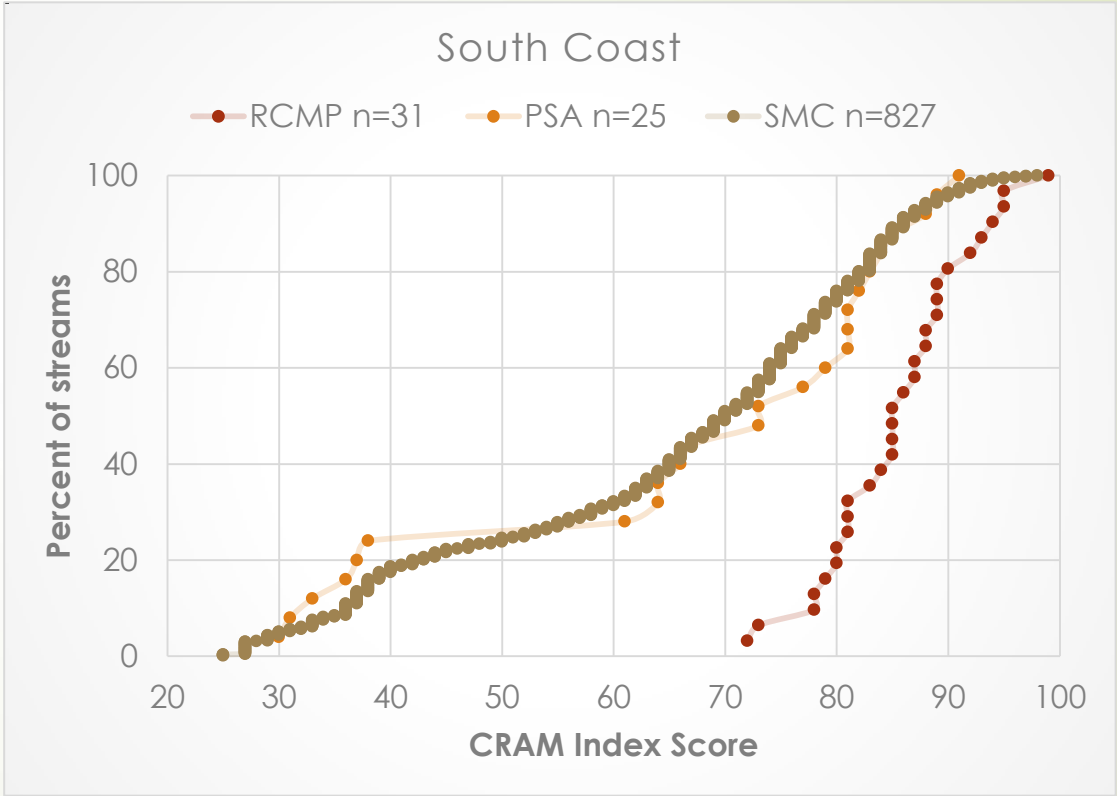
# Modoc

- RCMP Average:
  - Index: 82
  - B&L Attribute: 96
  - Hydrology Attribute: 85
  - Physical Attribute: 75
  - Biotic Attribute: 70
- PSA Average
  - Index: 80
  - B&L Attribute: 94
  - Hydrology Attribute: 82
  - Physical Attribute: 75
  - Biotic Attribute: 68



# South Coast

- RCMP Average:
  - Index: 86
  - B&L Attribute: 97
  - Hydrology Attribute: 86
  - Physical Attribute: 82
  - Biotic Attribute: 76
- PSA Average
  - Index: 67
  - B&L Attribute: 77
  - Hydrology Attribute: 71
  - Physical Attribute: 66
  - Biotic Attribute: 54



# Sierra

- RCMP Average:
  - Index: 84
  - B&L Attribute: 98
  - Hydrology Attribute: 82
  - Physical Attribute: 83
  - Biotic Attribute: 74
- PSA Average
  - Index: 79
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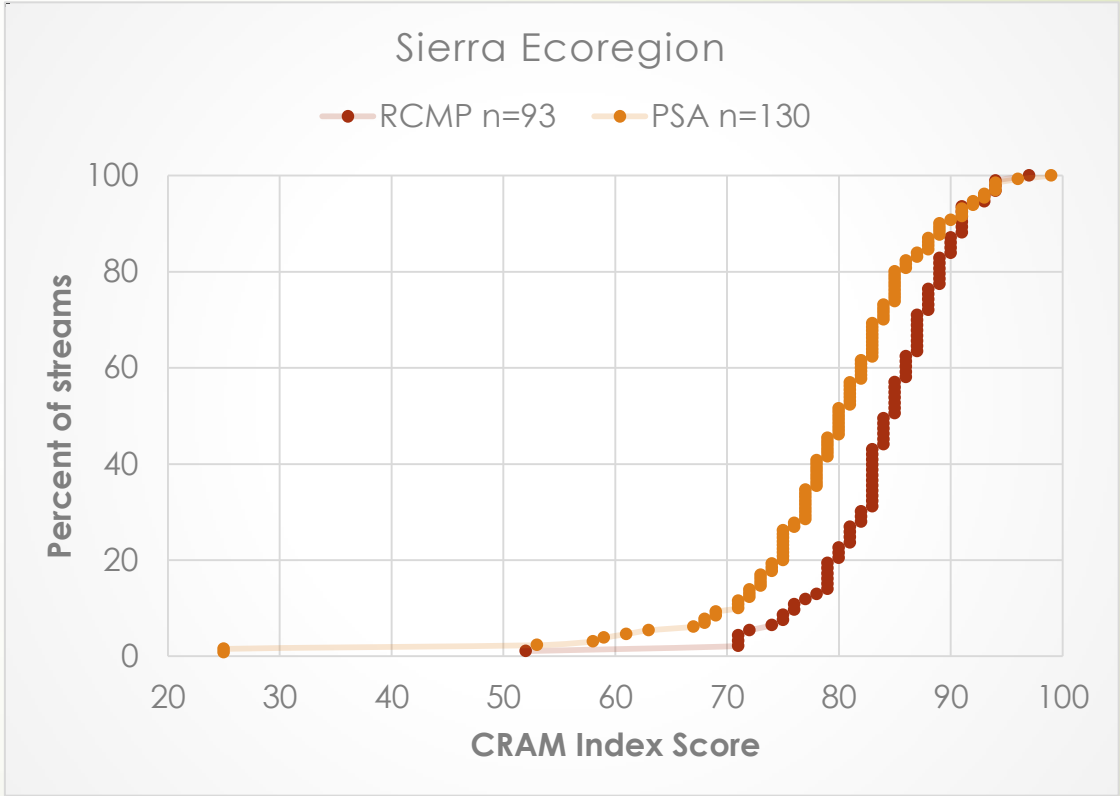
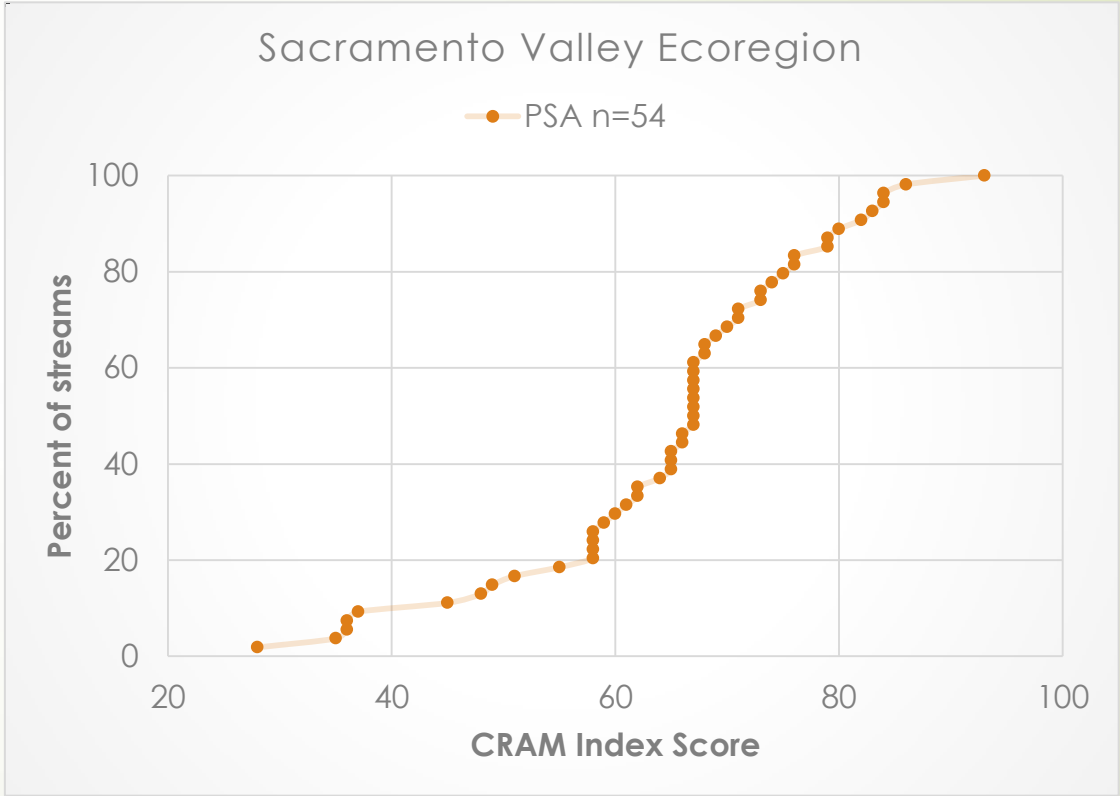
  - Physical Attribute: 76
  - Biotic Attribute: 68



# Sacramento Valley

- *RCMP Average:
  - Index: 66
  - B&L Attribute: 75
  - Hydrology Attribute: 62
  - Physical Attribute: 66
  - Biotic Attribute: 58
- PSA Average
  - Index: 65
  - B&L Attribute: 73
  - Hydrology Attribute: 61
  - Physical Attribute: 61
  - Biotic Attribute: 64




*RCMP has insufficient data for CFD (n=4)

# Mojave

- *RCMP Average:
  - Index: 77
  - B&L Attribute: 97
  - Hydrology Attribute: 79
  - Physical Attribute: 63
  - Biotic Attribute: 68
- *PSA Average:
  - Index: 75
  - B&L Attribute: 97
  - Hydrology Attribute: 79
  - Physical Attribute: 63
  - Biotic Attribute: 58
- Insufficient data for CFD
  - RCMP: n= 2
  - PSA: n= 2

# San Joaquin Valley

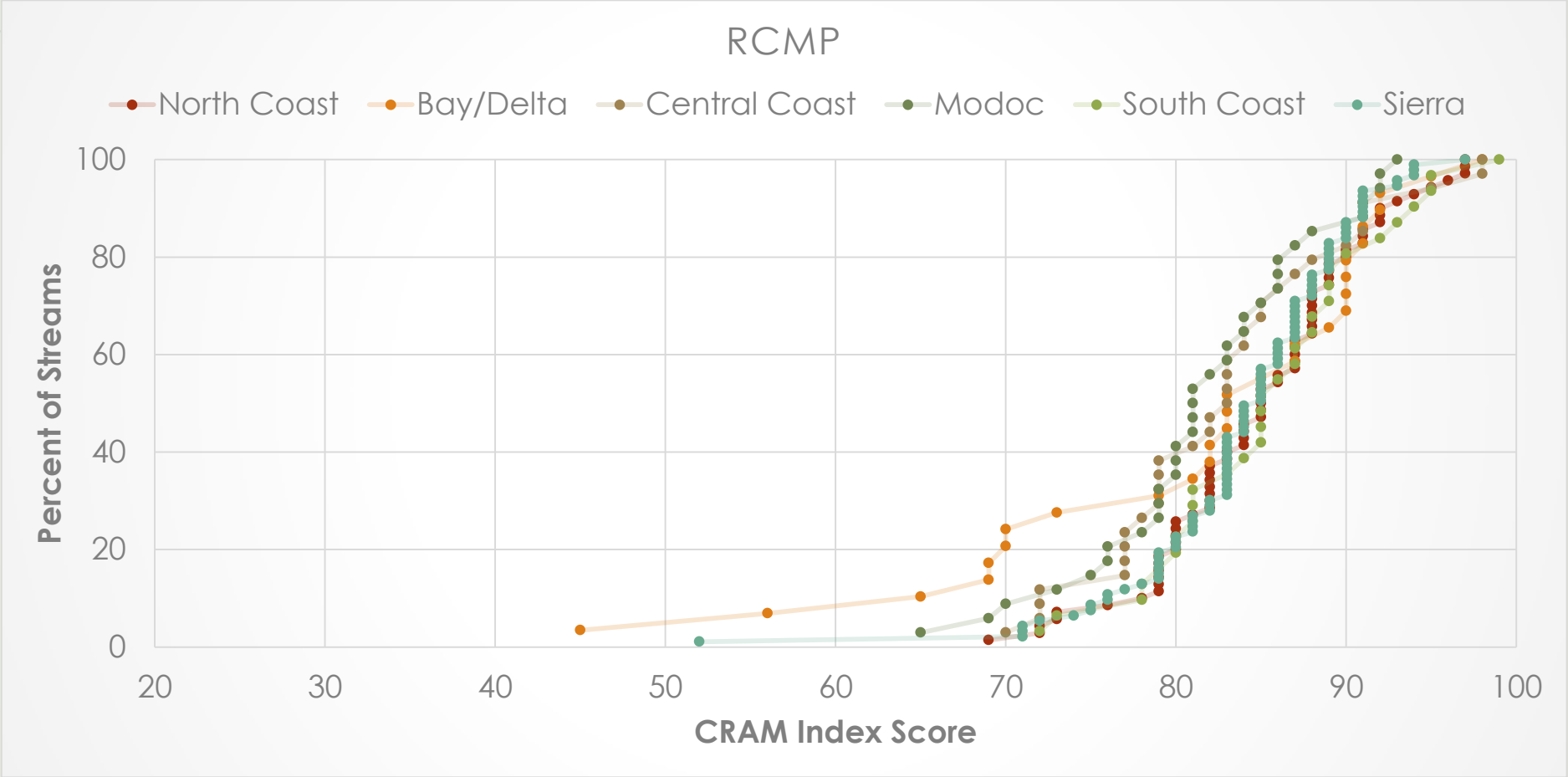
- RCMP Average:
  - Index: NA
  - B&L Attribute: NA
  - Hydrology Attribute: NA
  - Physical Attribute: NA
  - Biotic Attribute: NA
- *PSA Average:
  - Index: 60
  - B&L Attribute: 79
  - Hydrology Attribute: 60
  - Physical Attribute: 46
  - Biotic Attribute: 54
- Insufficient data for CFD
  - RCMP: n= 0
  - PSA: n= 6

# Colorado Desert

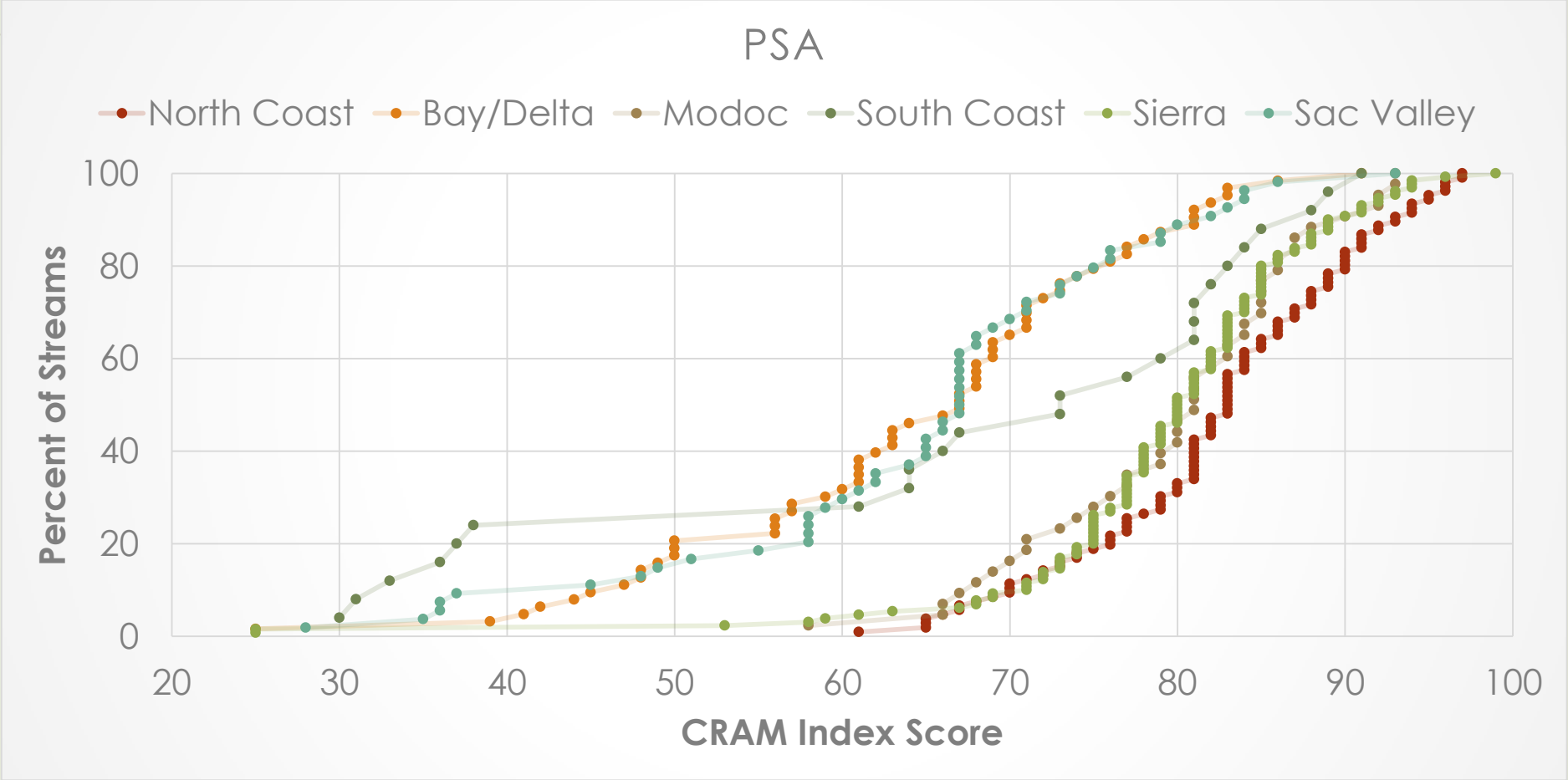
- *RCMP Average:
  - Index: 76
  - B&L Attribute: 92
  - Hydrology Attribute: 83
  - Physical Attribute: 80
  - Biotic Attribute: 50
- *PSA Average:
  - Index: 78
  - B&L Attribute: 100
  - Hydrology Attribute: 92
  - Physical Attribute: 63
  - Biotic Attribute: 56

- Insufficient data for CFD
  - RCMP: n= 5
  - PSA: n= 1

# All Ecoregions



# All Ecoregions



# Conclusions

- Ambient condition varies significantly by ecoregion
  - Bay/Delta and Sac Valley at the lower end
  - Sierra, Modoc and north Coast at higher end
  - South Coast has the widest range of scores
- Reference condition is consistent across the state

# Next steps

- Ecoregional curves for each attribute
  - Valuable information for stream restoration planning and implementation
  - Valuable information for regulatory requirements
- Explore data analysis perspectives in relation to existing level 1 and 3 data sets
- Suggest additional data collection to allow for CFDs for each region
  - PSA-Central cost Ecoregion
  - RCMP- Sacramento Valley Ecoregion
  - Both- Mojave, San Joaquin and Colorado Desert Ecoregions