Can YOU do better? Lessons from 3 years of competitive sockeye forecasting for Columbia, Fraser, and Bristol Bay Sockeye stocks

Gottfried Pestal (SOLV Consulting)
Sean Simmons (Angler's Atlas)
and the
Salmon Prize Community



OUTLINE

- **The Salmon Prize**
  - What is it?
  - What's the point?

- **Highlights**
  - 2024 and 2025: full sockeye competitions
  - 2026: no results yet , but can compare team submissions

- **How to get involved**
  - Organization
  - Research

The Salmon Prize

The Salmon Prize: What is it?

A competition …

- Annual event for teams from around the world
  - We provide them a standard data pack in the early summer
  - They try to predict salmon returns *before the season*
  - Official run sizes available in spring -> evaluate performance
  - Symposium and awards at WA/BC AFS Meeting
  - Repeat!
- So far: Sockeye stocks from Columbia, Fraser, Bristol Bay
- Lots of (small) cash prizes (e.g., top 3 overall and by basin)

… And a community

- Monthly calls (methods, hypotheses, updates)
- Github repositories for collaboration
- Youtube channel: www.youtube.com/@SalmonPrize/videos

The Salmon Prize: What's the Point?

- Encourage people to try new ideas/methods
- Recruit totally different approaches from outside salmon world
- Learn from each other and over time
- See if we can do better than the official forecasters (ADFG, DFO, CRITFC)
- Spin-off benefits (streamlining data exchange between agencies, environmental covariates research)

Highlights: Participation

- So far, 22 teams have registered and many have competed more than once.
- All teams provide brief method descriptions.
- Some have provided detailed supplementary documentation
- Some have even shared zenodo archives or github repositories with fully reproducible code and data

=> Let's meet some of the teams



OldRetiredGuy

Captain: **Alec MacCall**

Competitions joined **5**

- **2024 Overall Winner**
- Focus on large-scale regime shifts
- Qualitative judgment incorporated

Hooked On Data

Captain: **Julia Schmid**

Competitions joined **1**

- **2025 Overall Winner**
- Tested alternative machine learning algorithms

Voda IQ

Captain: **Brian Beckley**

Competitions joined **1**

- Used LLM to identify, program, and evaluate alternative forecasting models
- Evaluated whether LLM helped



Salmon Cruz

Captain: **Anna Poulton**

Competitions joined **4**

- Used Gaussian Process Empirical Dynamic Models (GP-EDM)
- Model forms combined spawners, returns, and many env. covars

Salmon Counts

Captain: **Yi Xu**

Competitions joined **3**

- Focus on simple, practical tools
- Used combination of Nearest-Neighbours and Recruits-Per-Spawner

Salmon ForecastR

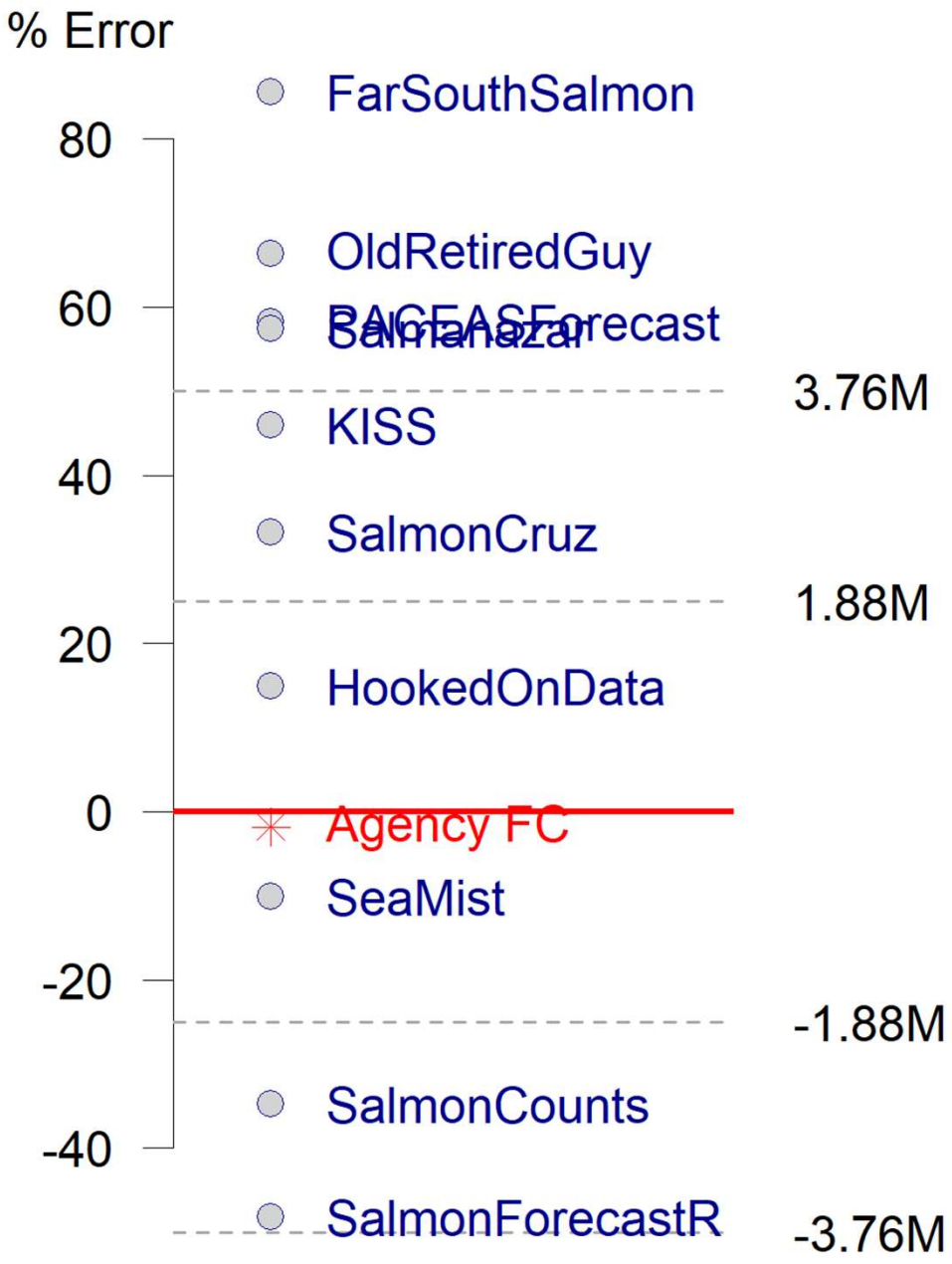
Captain: **Gottfried Pestal**

Competitions joined **4**

- Focus on testing and improving the *forecastR* tool kit (shiny app, R package)

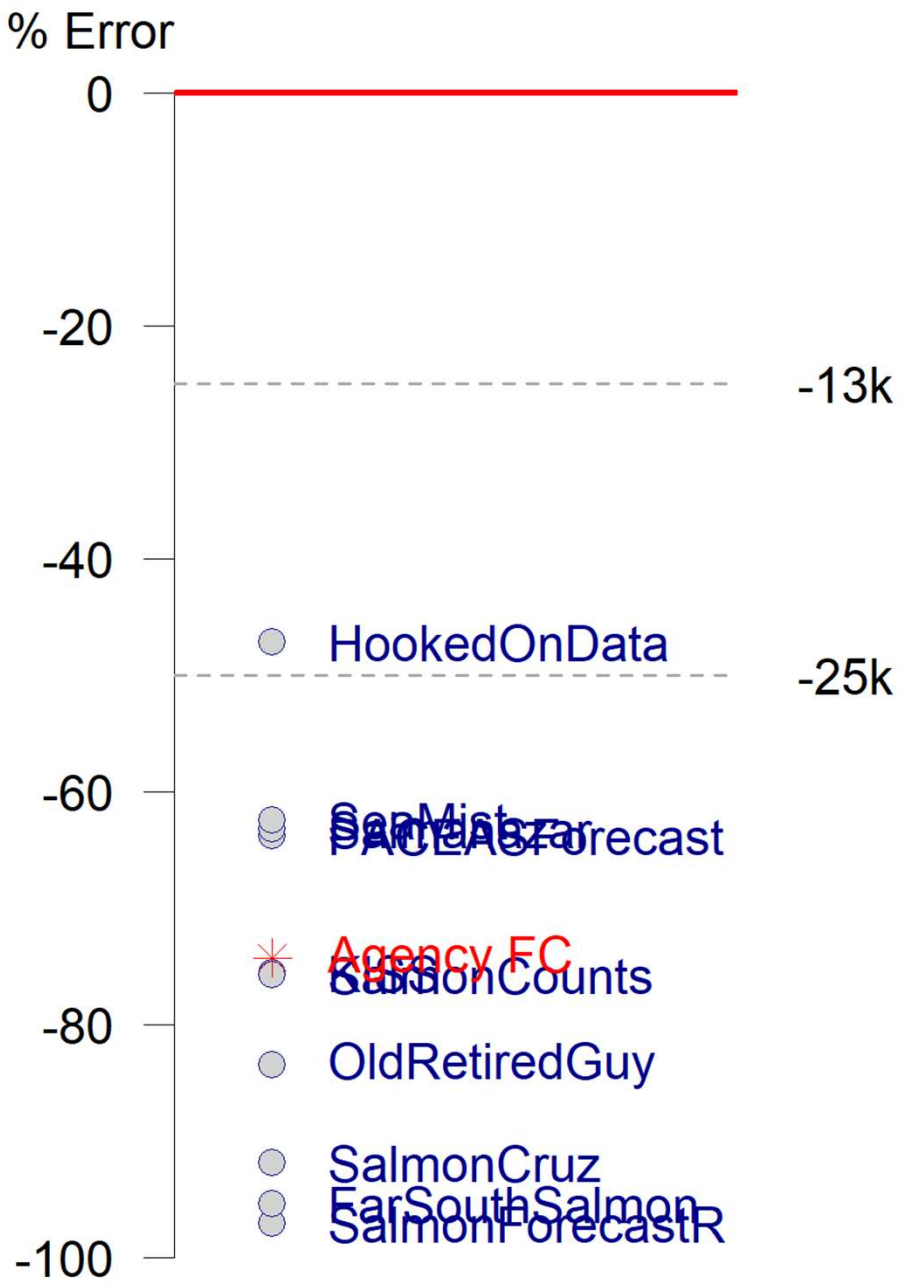
=> *Explore the rest of the teams at:* ***salmonprize.com/teams***

Highlights:
Every stock a different story



Kvichak (Bristol Bay): 2025

- Observed run: 7.5 Million
- Official agency forecast closer than any team
- Most teams within ± 50%



Raft (Fraser): 2025

- Observed run: 50,500
- Everybody substantially underestimated return
- Half the teams came closer than the official agency forecast

Highlights:
Salmon Prize vs. The Agencies

Salmon Prize vs. The Agencies: 2025 Overall

Team	Rank (MAPE)
HookedOnData	1
AgencyFC	**2**
Salmanazar	3
Ensemble_Mean	**4**
OldRetiredGuy	5
Ensemble_Median	**6**
SalmonCounts	7
KISS	8
SeaMist	9
SalmonForecastR	10
SalmonCruz	11
FarSouthSalmon	12
PACEASForecast	13

Salmon Prize vs. The Agencies: 2025 Bristol Bay (8 Stocks)

Team	Rank (MAPE)
AgencyFC	**1**
Ensemble_Mean	**2**
OldRetiredGuy	3
Salmanazar	4
HookedOnData	5
Ensemble_Median	**6**
SalmonForecastR	7
KISS	8
SalmonCounts	9
PACEASForecast	10
SalmonCruz	11
FarSouthSalmon	12
SeaMist	13

Salmon Prize vs. The Agencies: 2025 Fraser (5 Stocks)

Team	Rank (MAPE)
HookedOnData	1
KISS	2
AgencyFC	**3**
Salmanazar	4
OldRetiredGuy	5
Ensemble_Mean	**6**
SalmonCounts	7
Ensemble_Median	**8**
SeaMist	9
SalmonCruz	10
PACEASForecast	11
FarSouthSalmon	12
SalmonForecastR	13

Salmon Prize vs. The Agencies: 2025 Columbia (1 Aggregate)

Team	Rank (MAPE)
HookedOnData	1
SalmonCounts	2
SeaMist	3
Salmanazar	4
SalmonForecastR	5
Ensemble_Median	**6**
AgencyFC	**7**
Ensemble_Mean	**8**
OldRetiredGuy	9
FarSouthSalmon	10
KISS	11
SalmonCruz	12
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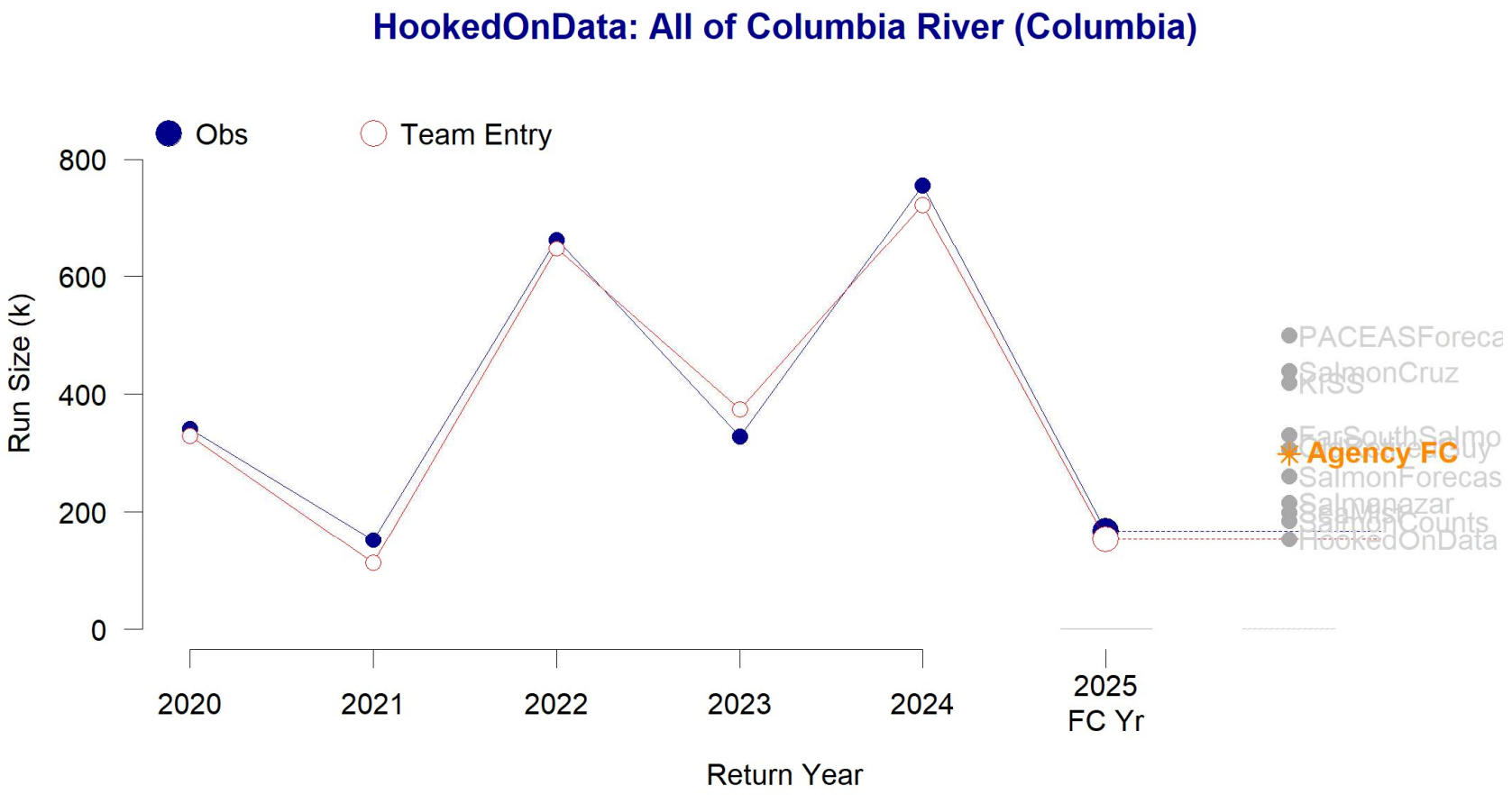
Highlights:
Is retrospective model selection still useful?

Is retrospective-based model selection still useful?

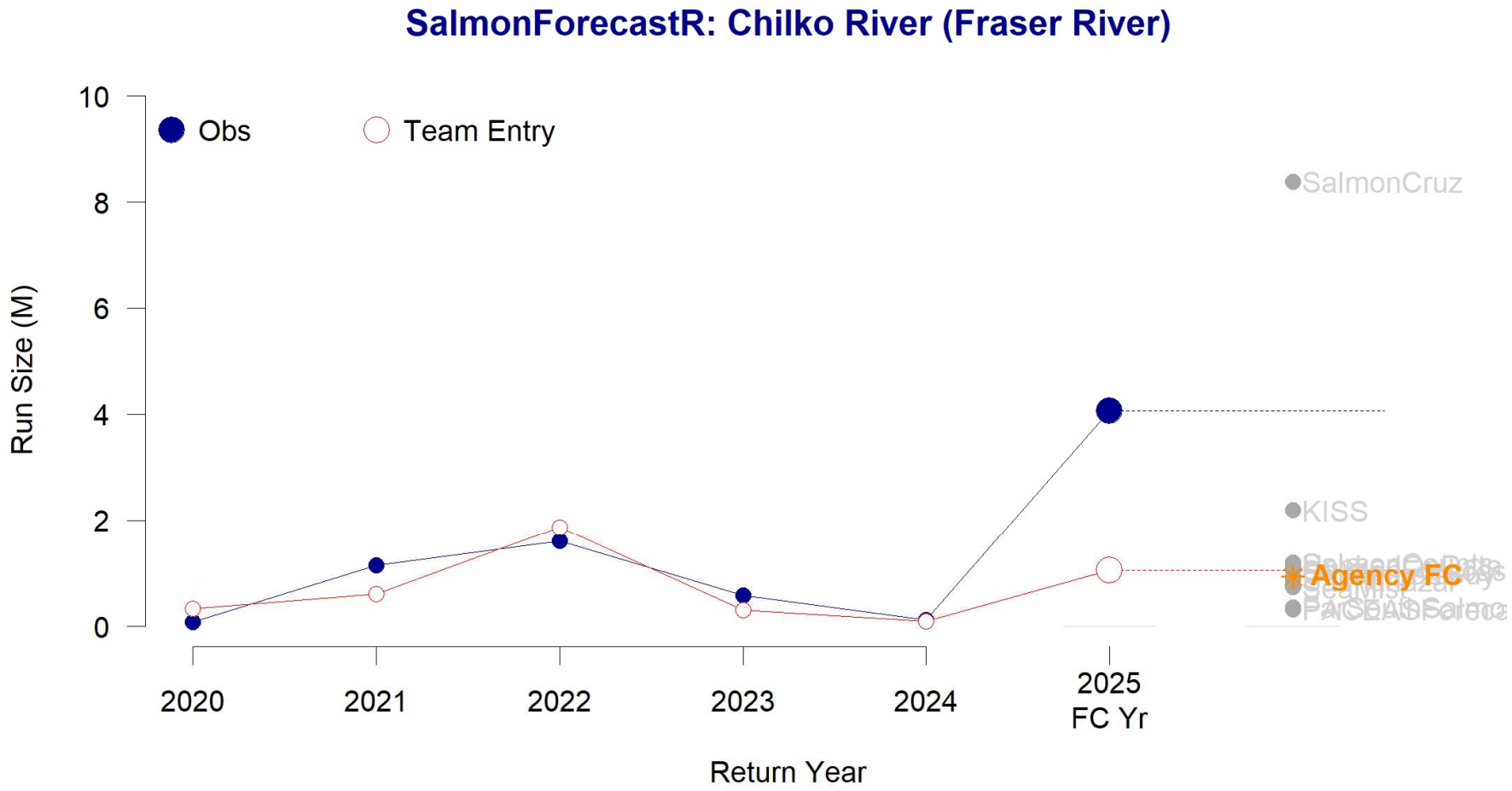


Team Model:

Agency Model:

Let's work together to build meta-data descriptors for these models, so that we can more systematically analyze performance across model types.

Is retrospective-based model selection still useful?



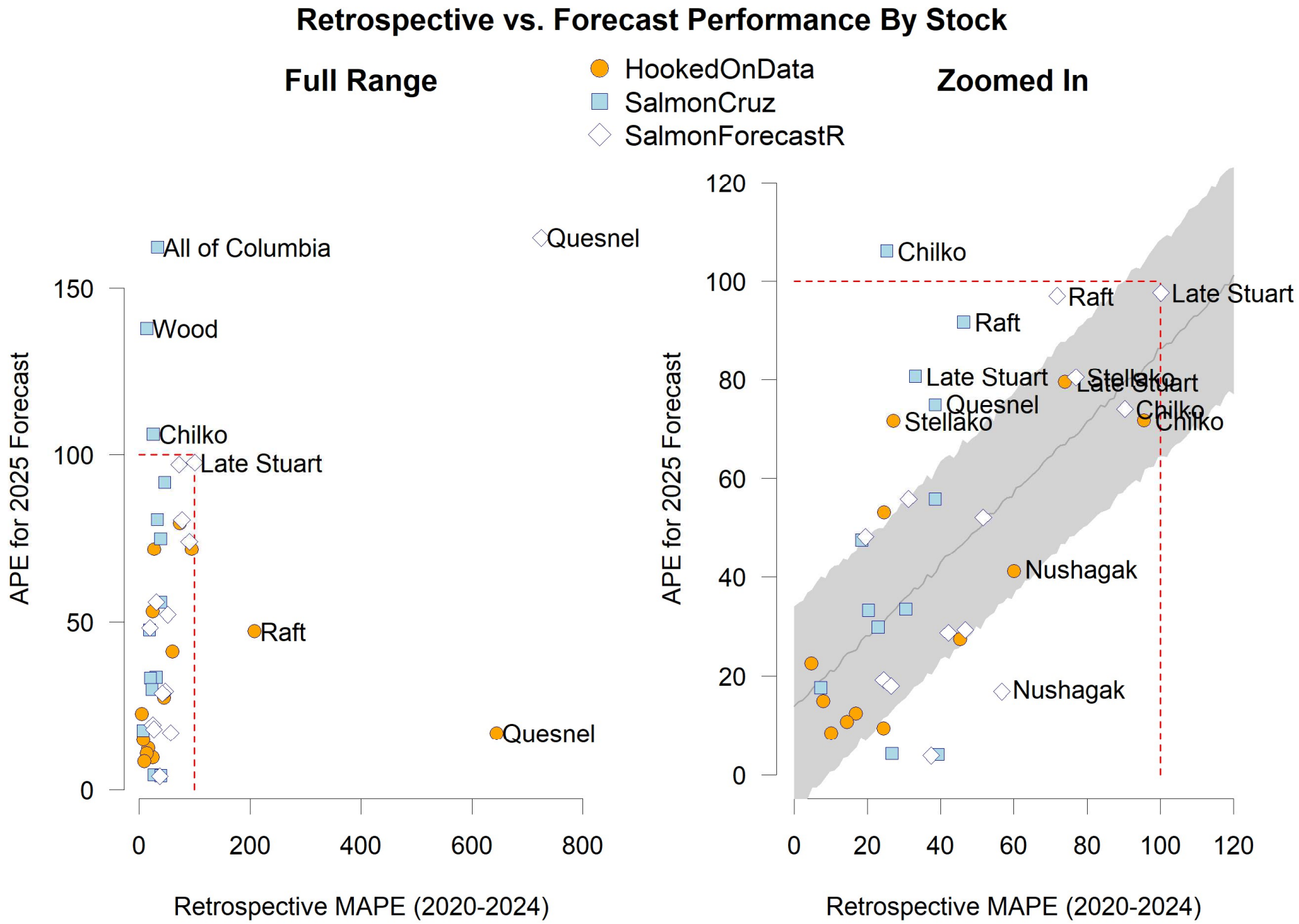
Team Model:

Age-specific model ranking in ForecastR App comparing various naive models; time series models; and sibling regressions. Age 3 used Naive 4-yr running Avg. Age 4 used log-power sib reg. Age 5 used sib reg with time-varying slope parameter (Kalman Filter).

Agency Model:

Cyclic Ricker model for age 4; sibling regression for age 5

Is retrospective-based model selection still useful?



Highlights:
2026 Team Submissions

Team name	Predicted # of salmon	Predicted # of runs
Salmon Cruz	48,366,333	8 / 8
Salmon ForecastR	45,910,538	8 / 8
Mako Dynamics	42,835,000	8 / 8
OldRetiredGuy	42,794,086	8 / 8
CBR Recruits	20,931,948	8 / 8

Bristol Bay: 2026

- 4 of 5 teams close in total forecast
- 1 team at ~ half that
- But: 8 stocks , portfolio effect

Team name	Predicted # of salmon	Predicted # of runs
PACEAS Forecast- PACific Ec	7,975,608	5 / 5
OldRetiredGuy	5,199,965	5 / 5
Mako Dynamics	4,052,492	5 / 5
Salmon Cruz	3,695,966	5 / 5
Salmon ForecastR	2,402,028	5 / 5

Fraser: 2026

- Much wider range
- Highest FC is more than **3 times** the lowest
- But: also fewer stocks

Team name	Predicted # of salmon	Predicted # of runs
PACEAS Forecast- PACific Ec	1,646,912	3 / 3
Salmon Counts	1,235,322	3 / 3
Salmon Cruz	690,090	3 / 3
CBR Recruits	590,297	3 / 3
OldRetiredGuy	352,436	3 / 3
Salmon ForecastR	156,958	3 / 3

Columbia: 2026

- Even wider range
- Highest FC is more than **10 times** the lowest

How to get involved

How to get involved

Organize

- Have some idea for funding source or sponsors?
- Want to start a competition for another salmon species?
- Want to start a competition for another region? (Japan? Scotland?)
- Want to help with wrangling the multi-agency data pack?

=> *Connect with us!*

Lots of Research to Be Done

- Have some salmon hypothesis or forecasting method ?

  => *Try it in the 2027 competition!*

- Curious about lessons so far?

  => *Help us get the meta-analysis team off the ground!*

Salmon Prize Links

- **Main Page:** https://salmonprize.com/
- **Diagnostics Repo:** https://github.com/SOLV-Code/SalmonPrize_Diagnostics
- **Data Management Repo:** https://github.com/SOLV-Code/SalmonPrize_DataManagement

Salmon Prize Diagnostics