Tuesday, July 30th, 2019

Post-season analysis of the 2019 Yukon River Chinook run timing forecast

With Chinook test fishing nets out of the water and ADF&G transitioned into Fall season management, we can now take a look at how the run timing forecast worked in 2019. As discussed in the pre-season outlook [1], due to unusually warm springtime weather including record low sea ice cover, we were expecting a bit of a curveball. In the end, the actual run timing was not all that far off the preseason forecast. Our initial forecast was for moderate run timing, with a 50% point of June 18th. By June 26th, the pre-season run timing forecast was matching the in-season data poorly enough to warrant refitting the forecast model [2] to the inseason data. The refit forecast [3] moved the 50% point to June 21st.

In the end, the actual 50% point observed at the Lower Yukon Test Fishery was June 23rd, a total of five days later than initially forecast (Table 1) and two days later than the refit forecast.

Table 1. Forecasted dates of percentiles of total catch per unit effort (CPUE) at the Lower Yukon Test Fishery in 2019 pre-season, in-season, and actual.

Percentile of total CPUE	Date Observed		
	Pre-season	Refit (In-season)	Actual
15	June 11	June 15	June 17
25	June 14	June 17	June 19
50	June 18	June 21	June 23

Historically, the forecast model tends to be, on average, two days off of the true run timing. We calculate this using hindcasting, which simulates how the model would have been performed if we had been running this project for decades. Hindcasting back to 2004 (an

arbitrarily-chosen 15 year window), we see that the forecast model has an average error of two days and a maximum error of six days. We can also see that, 87% of time, the actual run timing is within four days of the forecast.

Altogether, this year's forecast wasn't as good as some we've had but well within the historical range we've been seeing since starting this project. We thank the ADF&G Yukon staff for their continued support in operating test fishing and sonar projects along the river as well as for their critical communication throughout the pre-season and during the season. We also thank the Alaska Ocean Observing System (AOOS) and Axiom Data Science for logistical support with press releases and project website hosting.

Credits

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Footnotes

[1] https://aoos.org/wp-content/uploads/2019/05/2019-yukonchinook-finaltimingforecast.pdf

[2] Phillip R. Mundy, Danielle F. Evenson, Environmental controls of phenology of high-latitude Chinook salmon populations of the Yukon River, North America, with application to fishery management, ICES Journal of Marine Science, Volume 68, Issue 6, July 2011, Pages 1155–1164, https://doi.org/10.1093/icesjms/fsr080

[3] https://aoos.org/wp-content/uploads/2019/06/2019-yukonchinook-midseason-press-release.pdf