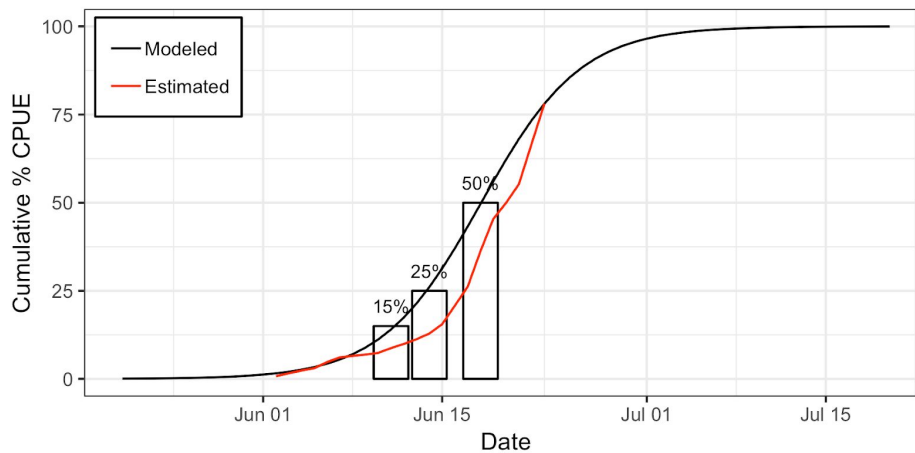




Wednesday, June 26th, 2019

## 2019 Mid-Season Yukon River Chinook Run Timing Forecast Update

The forecast and the test fishing catches in the Lower Yukon Test Fishery continue to drift apart (Figure 1) as the run progresses and an update to the forecast based upon the in-season catch data is in order.



**Figure 1:** Before the refit: Modeled (black line) and estimated (red line) cumulative percent catch per unit effort (CPUE) prior to the refitting process shows the mis-match between the two curves.

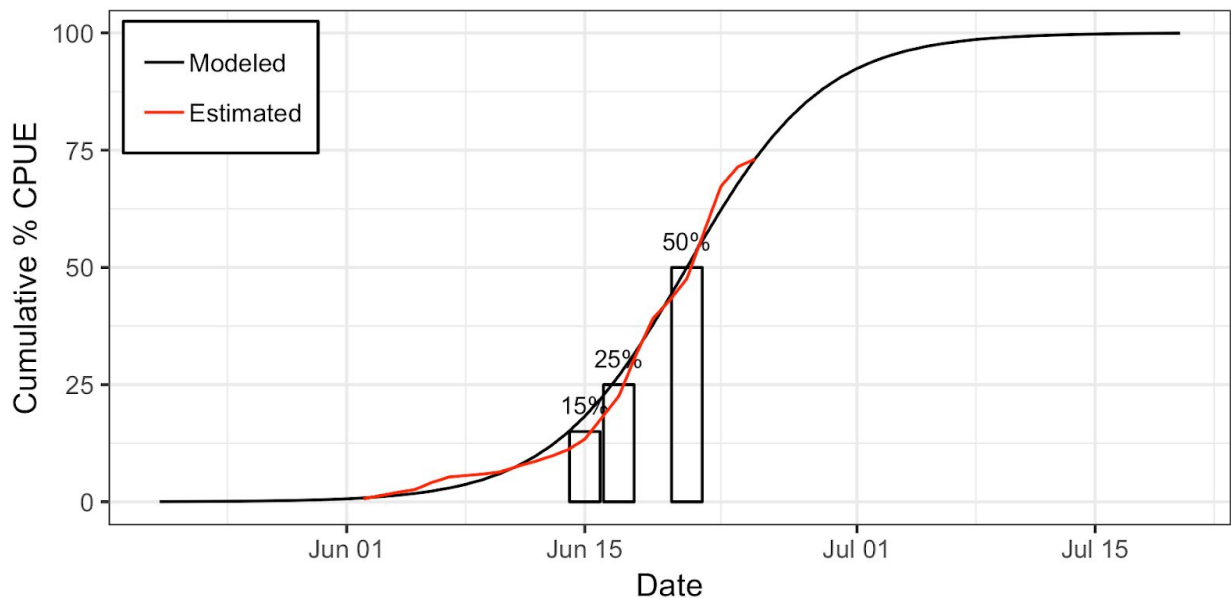
As discussed earlier this year in the pre-season forecast, years such as this one with low spring sea ice cover are typically associated with less precise timing forecasts. The model underlying the forecast [1] is based upon the theory that sea ice and wind-driven mixing off the delta play large role in controlling the entrance of fish into the river. 2019's spring sea ice was the lowest on record and wind speeds at Emmonak have been relatively low at times during June.

This refitting process is a statistical and graphical process that aims to find the most likely run timing forecast given the in-season data collected up to a certain date. It's based upon two things: (1) the fit between the modeled and estimated cumulative catch per unit effort (CPUE) (Figure 1) and (2) the stability of the final CPUE estimate. The refitting process yielded a new 50% date of June 21 (Table 1).

**Table 1:** Dates of forecasted percent total CPUE before the refit (Old Dates) and after (New Dates) shows new forecast dates of June 15 (15%), June 17 (25%), and June 21 (50%).

Percent Total CPUE	Old Dates (June)	New Dates (June)
15%	11	15
25%	14	17
50%	18	21

The refit forecast matches the inseason test fishing data much better than before (Figure 2). Altogether, this year's timing forecasting effort is shaping up pretty similar to last year, which also had a warm spring and low ice cover and also required a refit in the middle of the run.



**Figure 2:** After the refit: Modeled (black line) and estimated (red line) cumulative percent catch per unit effort (CPUE) after the refitting process shows a close correspondence between the two curves.

### Credits

Prepared and reviewed by Bryce Mecum (brycemecum@gmail.com), Jordan Watson (jordan.watson@noaa.gov), and Phil Mundy (proymundy@gmail.com). Data management

and web page support by Will Koeppen (will@axiomalaska.com). Web support also provided by Holly Kent (kent@aoos.org). Yukon Chinook in-season salmon data and management agency coordination by Fred West (fred.west@alaska.gov), Holly Carroll (holly.carroll@alaska.gov), and Sean Larson (sean.larson@alaska.gov). Financial and material supports were provided by the Alaska Ocean Observing System, NOAA National Marine Fisheries Service, and the Alaska Department of Fish and Game.

## **Footnotes**

[1] 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>