

Maturity workflow updates

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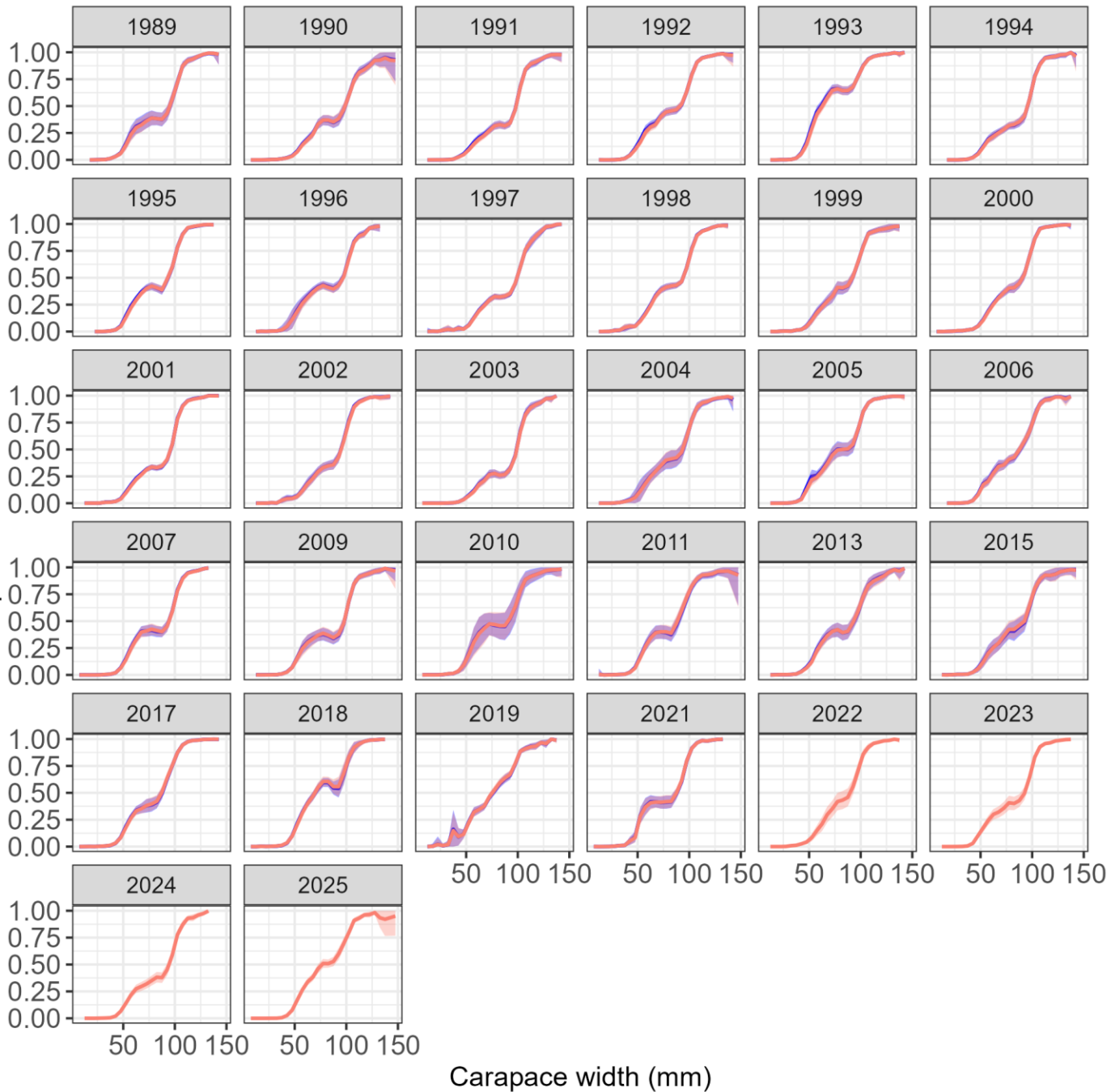


NOAA
FISHERIES

Comments from January CPT

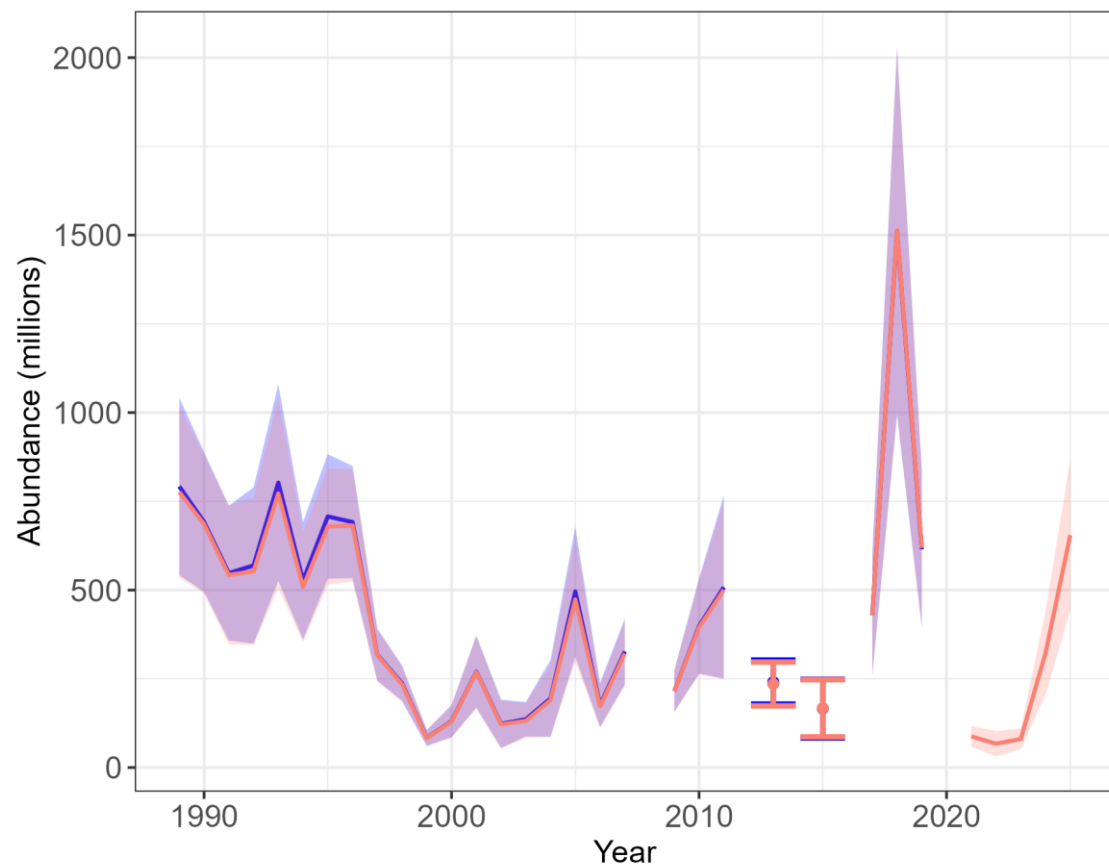
1. “The CPT noted that it would be possible to fit the models using a Bernoulli rather than a binomial likelihood, obviating the need to discretize the data”
 - Addressed. Models are now fit using Bernoulli likelihood by size without any size binning.
2. “CPT members also noted that one extra component of variance needs to be accounted for in the new workflow: the step in which uncertainty is quantified by summarizing ogive variation across draws appears to be missing the subsampling component of variance. **The CPT recommended incorporating this subsampling component of variance into the new workflow**”
 - Addressed. Bootstrapped to simulate the subsampling fraction uncertainty and propagated through to ogive and SAM estimates within each sdmTMB simulation draw.
3. Retrospective analysis evaluating if withholding recent years of data changes ogive shape/uncertainty – Buck
 - Addressed. Withholding years does not significantly change ogive shape + uncertainty or abundance + uncertainty.

Snow

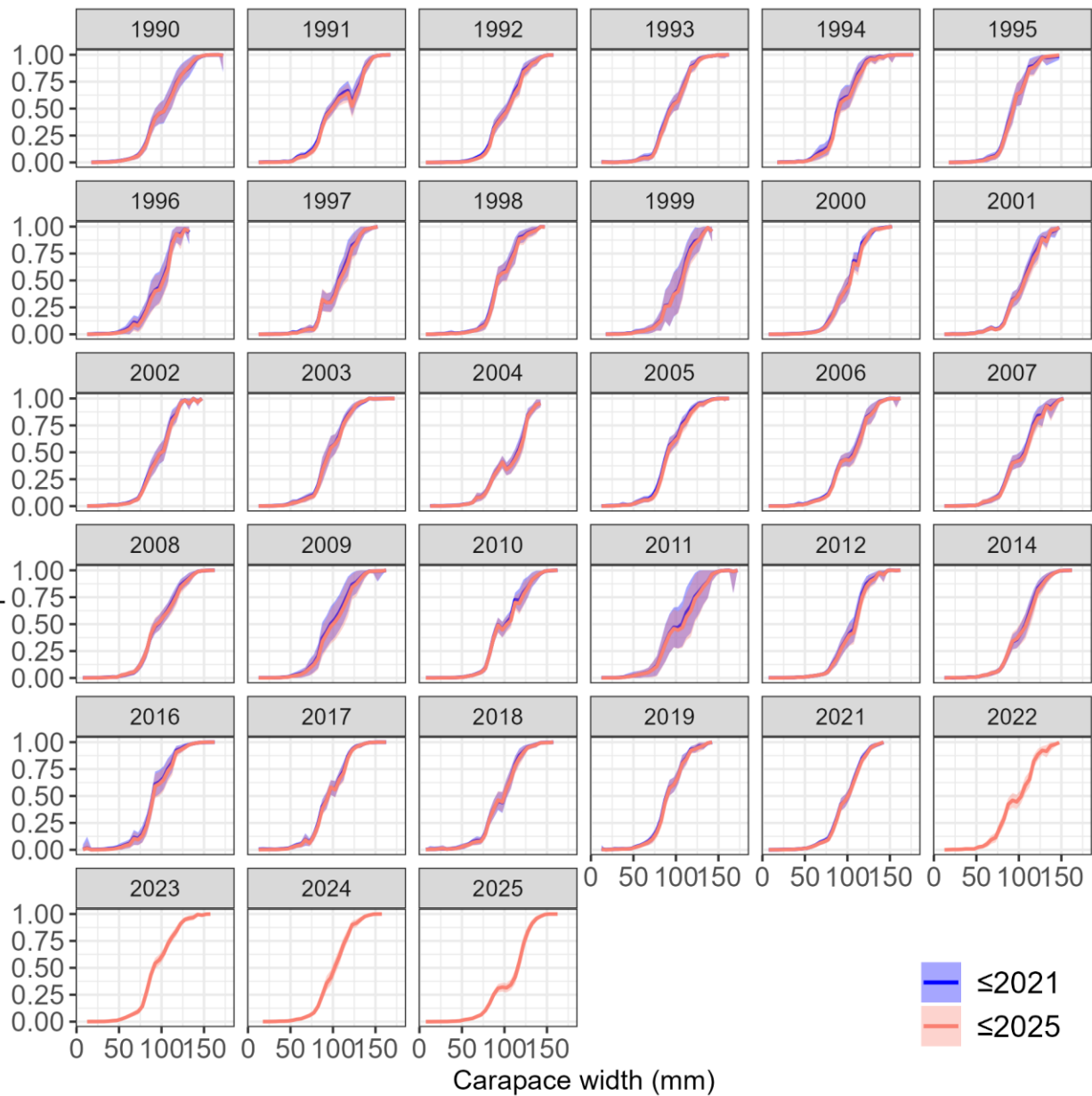


— ≤ 2021
— ≤ 2025

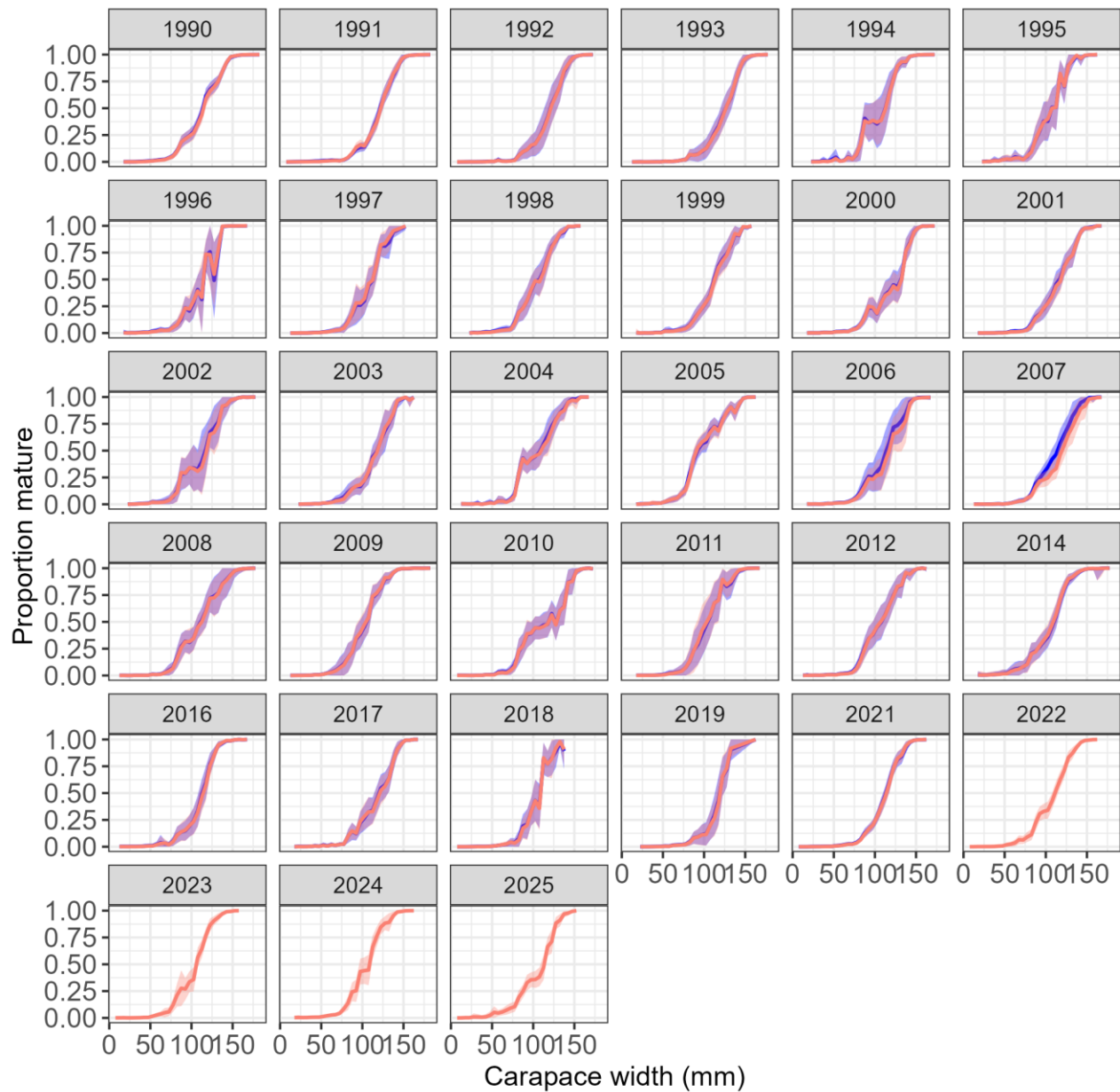
Snow



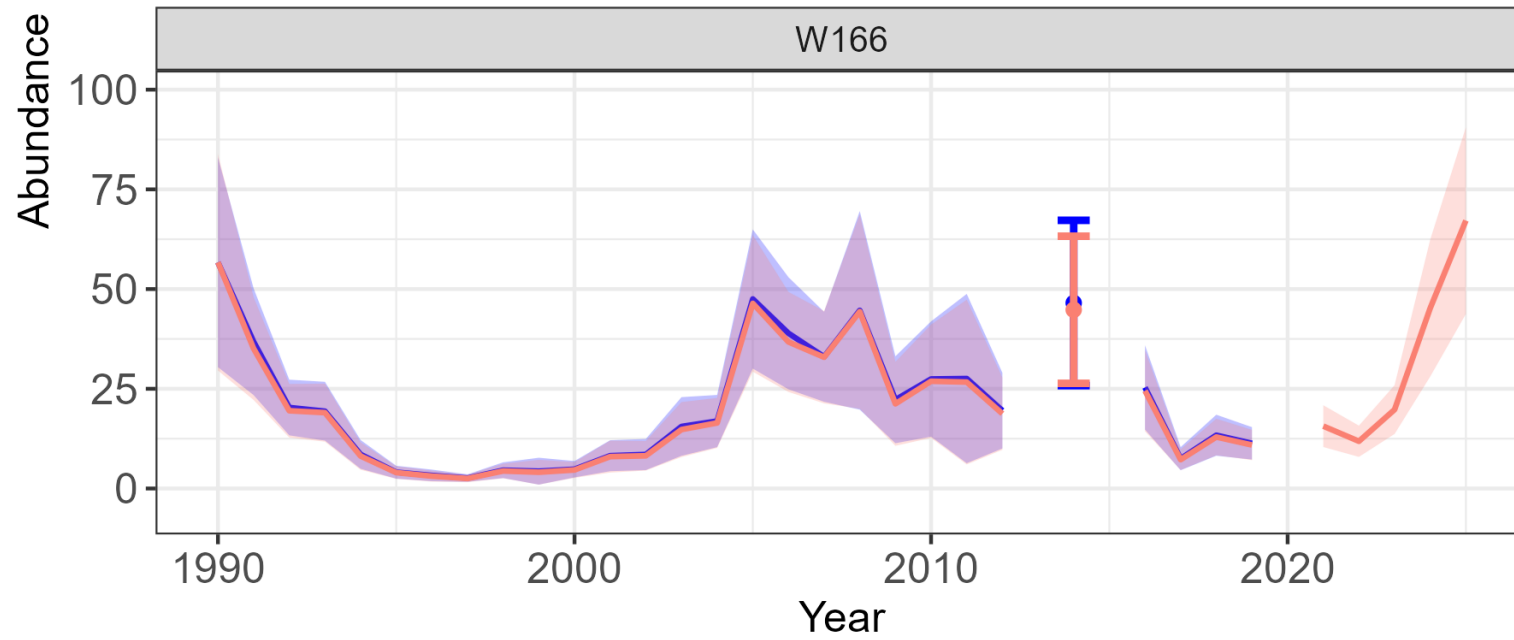
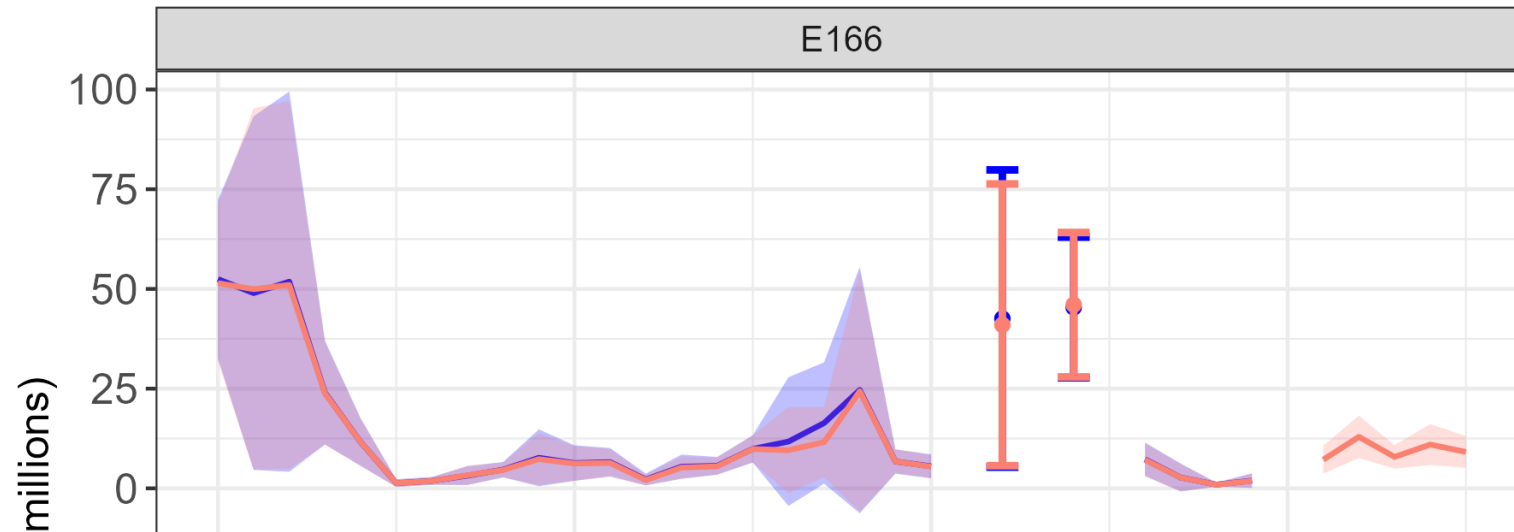
Tanner West



Tanner East



Tanner



| Legacy workflow | Proposed workflow |
|---|---|
| Uses 10mm bins in model fitting | Does not bin in model fitting |
| Fits nls logistic models to chela data | Fits sdmTMB models to chela data |
| Uses proportion mature as the response, calculated using sampling factor | Uses Bernoulli (mature/immature) as response |
| Assumes logistic maturity-at-size ogive shape | Flexibly models maturity-at-size via gam-style smooths |
| Does not account for uncertainty in maturity due to uneven sampling across space, time, and size bins | Robust to spatiotemporal gaps and variability in maturity through random fields; uncertainty is also tied to sample sizes via Bernoulli structure and propagated across all workflow steps; abundance-at-size (sampling factor) uncertainty also simulated and propagated |
| Models not vetted through diagnostics | Models vetted through diagnostics |
| Size-at-50% maturity and ogives do not account for population size | Size-at-50% maturity and ogives are weighted by abundance to account for population size |

*updates from January 2026 CPT