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NOAA FISHERIES
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2025 AFSC Seminar Series

Emily Ryznar, RACE Shellfish Assessment Program

Tuesday, April 29th @ 10 am Pacific

Fisheries-dependent distribution models to aid red king crab management in data-poor seasons

Persistent declines in red king crab (*Paralithodes camchaticus*) abundance in Bristol Bay, Alaska, have triggered recent fishery closures and heightened interest in conservation measures for the stock. However, fisheries-independent data are only collected in the summer, and this lack of seasonal distribution data in non-summer months hampers the evaluation of proposed management actions that target Bristol Bay red king crab (BBRKC) bycatch in groundfish fisheries active in the fall, winter, and spring. We addressed this issue by developing species distribution models for BBRKC using fisheries-dependent data as a step towards understanding factors regulating BBRKC spatial dynamics in non-summer months and improved scientific advice for management. Our specific objectives were to model BBRKC: 1) legal males in the fall; and 2) bycatch in non-pelagic trawl (NPT) groundfish fisheries during peak bycatch seasons (September-October, January-February, and April-May). For both objectives, we trained Boosted Regression Tree SDMs and evaluated out-of-sample predictive performance. Model evaluation metrics indicated good to excellent predictive ability for both objectives. These models are the first dynamic predictive tools to evaluate BBRKC distribution in data-poor periods and represent an important step towards operating models that may be used to evaluate proposed management actions.

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