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Title

Bomb carbon in the yelloweye rockfish, *Sebastes ruberrimus*, as a chronological benchmark for age validation of commercially important fishes

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The overall goals of this study were to (1) establish a chronological benchmark for bomb radiocarbon in the waters of southeast Alaska by determining radiocarbon levels in otoliths of the yelloweye rockfish (*Sebastes ruberrimus*), for which age was validated, (2) validate the age of quillback rockfish (*S. maliger*), bocaccio rockfish (*S. paucispinis*), cowcod (*S. levis*), and canary rockfish (*S. pinniger*) using the yelloweye rockfish radiocarbon chronology, (3) provide a basis for future age and growth studies of marine fishes in the northwest Pacific using the radiocarbon record, and (4) apply the technology to sharks (e.g. validate the age and ageing methodology of the shortfin mako, *Isurus oxyrinchus*, and investigate its application to the white shark, *Carcharodon carcharias*).

California Sea Grant funded publications that pre-date and resulted from this study are listed below. Please contact Allen H. Andrews at allen.andrews@noaa.gov.

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Andrews, A.H., G.M. Cailliet and K.H. Coale. 1999. Age and growth of the Pacific grenadier (*Coryphaenoides acrolepis*) with age estimate validation using an improved radiometric ageing technique. *Can. J. Fish. Aquat. Sci.* 56:1339–1350 (R/F-148)

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Kerr, L.A., A.H. Andrews, B.R. Frantz, K.H. Coale, T.A. Brown and G.M. Cailliet. 2004. Radiocarbon in otoliths of yelloweye rockfish (*Sebastes ruberrimus*): a reference time series for the coastal waters of southeast Alaska. *Can. J. Fish. Aquat. Sci.* 61:443-451.

Stevens, M.M., A.H. Andrews, G.M. Cailliet, K.H. Coale, C.C. Lundstrom. 2004. Radiometric validation of age, growth, and longevity for the blackgill rockfish, *Sebastes melanostomus*. *Fish. Bull.* 102:711–722

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Kerr, L.A., A.H. Andrews, G.M. Cailliet, T.A. Brown and K.H. Coale. 2006. Investigations of $\Delta^{14}\text{C}$, $\delta^{15}\text{N}$, and $\delta^{13}\text{C}$ in vertebrae of white shark (*Carcharodon carcharias*) from the eastern Pacific Ocean. *Environ. Biol. Fish.* 77:337–353.

Ardizzone, D.A., G.M. Cailliet, L.J. Natanson, A.H. Andrews, L.A. Kerr and T.A. Brown. 2006. Application of bomb radiocarbon chronologies to shortfin mako (*Isurus oxyrinchus*) age validation. *Environ. Biol. Fish.* 77:355–366.

Andrews, A.H., L.A. Kerr, G.M. Cailliet, T.A. Brown, C.C. Lundstrom and R.D. Stanley. 2007. Age validation of canary rockfish (*Sebastes pinniger*) using two independent otolith techniques: lead-radium and bomb radiocarbon dating. *Mar. Freshwater Res.* 58:531–541