

Title: Functional morphology and evolution of premaxillary protrusion: how and why does your goldfish make that face?

Abstract: Premaxillary protrusion, the ability to shoot the jaws toward prey items while feeding, has independently evolved in several groups of unrelated fishes, an example of convergent evolution. Cypriniform fishes (goldfish, carp, minnows) protrude their jaws in a much different way than acanthomorph fishes (cichlids, perch, bass). Recent media attention has brought attention to several cypriniform species, the invasive carps that are posing a significant risk to the Great Lakes ecosystem. The success of these species is likely due in part to several feeding adaptations, including premaxillary protrusion. Using high-speed videography and 3-D bone animation, along with classical anatomical techniques, I will tell the story of how these fishes use their jaws to efficiently feed in a dense, aquatic medium. This work is integrative, drawing from several sub-fields of biology, allowing for a more comprehensive explanation of why your goldfish and his relatives make that funny face.