



Primary research interest focuses on the physiological aspects of growth, development, and bioenergetics (quantification and allocation of energy). I also have a background of creating bio-assessment models that are calculated from fish and invertebrate population counts as well as physiological and energetic parameters of individual organisms. These models are used to detect environmental perturbations and human actions in regard to fish, invertebrate, community and overall ecological health. My graduate program was devoted to the study of fish bioenergetics and physiology; and scaling these parameters from individual to population aspects. In this, I have developed, innovated and published the first work on fish using bioelectrical impedance analysis (BIA) to measure compositional components that include fat, protein, water, dry, ash, and energy content; and relating these measures with condition. Non-lethal estimation of body composition using bioelectrical impedance analysis in lower vertebrates will permit increased precision in energy flow and proximate composition studies as well as permit the study of community energetics and condition on spatial and temporal scales not previously possible. Co-founder and Chief Scientific Officer of CQ Foods, a company that manufactures electronic devices that measure, monitor, store and auto-analyze metrics that help monitor different aspects of growth of aquaculture species. The same system can be used to monitor mariculture facilities. Currently, the data pathway provides real-time analysis of different parameters including GPS, temperature, length, weight and body composition. The pathway will be able to accommodate any other metrics such as salinity, pH, conductivity and depth. Personally, Dr. Cox has over 20 years of experience working with organisms including plants and animals that vary in size from whales to bacteria.

## **Alaska Seafood and the importance of bioimpedance current and future applications**

*Marlin Keith Cox - Bialume Tech Inc., Juneau AK (keith@bialume.com)*

Alaska Seafood plays a vital role in the state's economy, culture, and global markets. With decades of experience in bioimpedance research, Dr. Keith Cox and Bialume Technologies are leveraging innovative approaches to address the challenges facing the Alaska seafood industry. This talk will explore the importance of Alaska Seafood, the pressing issues it faces, and how past research informs current solutions. By developing a versatile research and commercial-facing device using the same hardware, we aim to bridge the gap between discovery and commercialization, reducing the time required for translational science. The presentation will highlight data on fish quality, shrimp, previously frozen products, and other seafood metrics, showcasing how bioimpedance is used to measure, compile, process, and analyze this information. Our approach not only offers a path to sustainable innovation but

also underscores the critical role of advanced technology in ensuring the future of Alaska's seafood industry.