SCIENCE – ECOSYSTEM ANALYSIS

Understanding the structure and dynamics of pelagic ecosystems is critical for assessing the impacts of fishing activities and environmental factors on target stocks and other species including by-catch and protected species belonging to this ecosystem. Studying the trophic relationships leads to development of ecosystem models which provide the basis to test ecosystem-based management options and provide management and monitoring advice to the WCPFC and Pacific SIDS.

SPC conducts several activities to acquire the right scientific knowledge with which to provide advice for the management of the pelagic western tropical Pacific Ocean ecosystem. An important activity constituting the basis for ecosystem modelling is the analysis of pelagic fish stomach samples collected by the national observer programmes of the region. The results of the stomach content study in conjunction with stable isotope and fat content analyses, allow us to qualitatively and quantitatively describe the trophic relationships between the different species of the ecosystem, including tuna.

This information is included in quantitative and qualitative ecosystem models under development that already demonstrate the complexity of the western tropical pelagic ecosystem in comparison to an eastern tropical system. Developing and comparing models helps understanding of how this complex ecosystem functions, interpreting and assessing the qualitative and quantitative impacts on target species (tuna) but also on all the other species of environmental variability (e.g. climate change, strong El Nino events). It also provides the ability to test different management scenarios and assess their impact on the ecosystem to determine the most appropriate option according to the objectives set up by managers.