

Connectivity among populations -the never ending story?

Michael Kingsford

*College of Marine and Environmental Sciences, James Cook University Townsville, Australia 4811
(michael.kingsford@jcu.edu.au)*

The persistence of marine populations depends in part on pathways of larval connectivity. There is a long history of research on connectivity, accompanied by major paradigm shifts. Historical perspectives emphasized passive drift and the role of currents as potent vectors of connectivity. The pre-settlement period of marine species can vary from minutes to the extremes of teleplanic larvae that may be in the water column for years and even connect populations from different continents. The reef fraternity did not investigate connectivity seriously until the 1980s and more comprehensively in the nineties. Early models suggested larvae could disperse hundreds of kilometers in currents. Although some taxa were demonstrated to have larvae of limited mobility, the larvae of groups such as fish and some crustacean larvae were shown to swim well and have excellent sensory abilities that could assist with orientation. A break-through in coral reef science was the demonstration that a high percentage of larvae return to natal reefs. Modelling has shown that not all matrices of reefs are the same and density of reefs will have a greater potential for natal recruitment. Further, the realized 'smartness' of larvae gets greater every year. We now know that some larvae respond to smell, noise and even the sun. Some fish have been shown to have a near reef searching phase as potential settlers. Further, modelling has demonstrated that even in strong currents with multiple senses a high percentage can make it home. Corroborative evidence comes from genetics in that despite great potential for larval immigration via currents some closely spaced reefs have shown a persistent genetic differentiation. I finish with a plea, as a 'warmly printed' paradigm cools we should not forget that some larvae travel long distances and that 'founder effects' have a potentially strong role in adding to population networks.