Statement of Interest

Do's:

- Explain something about yourself, your self-discipline, time management skills, motivation, and drive for seeking a graduate degree in your field
- Mention scientific accomplishments that you are particularly proud of and why – try to explain to the committee how you evaluate yourself in terms of accomplishments and productivity
- Try to present a clear and well thought-out idea of who you are and what you would like to do in graduate school
    - Briefly introduce the general problem (why would anyone care?), and then get to the specific area of your interest
    - Explain what you would like to accomplish with regards to resolving some open question – BUT don't come across as dogmatic or claim that you're going to solve any of the world's problems! (see DON'TS below)
- Specifically mention any faculty members that you would like to work with, and whether you have contacted them about the possibility of working in their lab
- Explain why you think that lab or graduate program is a great place and would be a good fit for what you are looking for from your graduate education – i.e., what are the specific reasons that you are applying to THIS program as opposed to any other?
- Explain what your ultimate career goal is (e.g., a state biologist, resource manager or NGO, faculty position at a major research university, etc.)

Don'ts:

- Take more than a couple of pages to make your point – admissions committees have to read a couple hundred of these things, and the statements that make a compelling case for acceptance in 1-2 pages are MUCH more successful than ones that ramble for 5 pages (and are never read to the end because they are too long!)
- Have any typos, spelling mistakes or missing punctuation. Like it or not, writing is an essential part of being a successful scientist, and a poorly written statement is **always** a red flag to admissions committees!
- Try to be cutesy and tell nice stories about how your love of squirrels and dolphins as a child has led you to want to be a biologist and save the world – this is a career path that you are trying to pursue, and attempts at being overly cute or humorous are almost always considered unprofessional.
- Claim that you'll solve some global problem – individuals can only ever do a small part by ourselves, and although we can each advance knowledge about the natural world, we're just not going to solve some burning problem by ourselves in grad school. If it was that simple, someone would have probably done it already!
- Appear to be too set in your ways – you want to convey an interest in an area and show that you've given it some serious thought, but not come across as dogmatic or stubborn (in my case, I had already spoken to my prospective advisor extensively one-on-one about the project I planned to do, and he was all for it, so my statement is much more specific than average)
- Say anything negative about anyone or anywhere else – no one wants to hear you put down the program or advisors at another college (even if they agree with you), and being negative simply belittles your application

Robert J. Toonen - Statement of Interest

Many studies of population dynamics continue to focus only on adult organisms, despite the prolonged urging of some researchers, to study organisms as entire, temporally dynamic life cycles. This urging is of particular importance among species in which the adults are sedentary (e.g., most plants & many marine invertebrates), but the juvenile stages have great potential for long-distance transport. In such groups, it is difficult to envision how genetic differences leading to **speciation** can occur, because **gene flow** (the successful exchange among conspecific populations of individuals who survive to reproduce in the population to which they migrate) should prevent divergence of geographically separated populations. Approximately 80% of marine organisms (over 90,000 species), both vertebrate and invertebrate, have a biphasic life cycle; they produce planktonic larvae which spend some variable amount of time (ranging from minutes to months or even years, depending on the species) developing in the water column before settling and metamorphosing into the adult body form. During this planktonic period, these freely-swimming larvae could potentially be transported by water currents from tens of centimeters to thousands of kilometers. Many biologists equate this potential for larval dispersal with high rates of migration, and several authors have gone so far as to view the pelagic stage as an adaptation for gene flow. However, the actual frequency and distance of migration by planktonic marine larvae is virtually unknown. Furthermore, empirical evidence shows that differentiation of populations separated by even short geographical distances is often significant, and species richness in many marine habitats is exceptionally high. These observations beg explanation, but the processes governing dispersal of marine invertebrates remain enigmatic.

I hope to address this issue during my graduate research by combining the most sensitive molecular genetic techniques currently available with state-of-the-art physical oceanographic studies. By using a suite of oceanographic techniques, I would be able to follow and collect larvae throughout the planktonic period to determine the paths that most larvae follow during planktonic dispersal. Physical tracking is limited however, because the rare dispersal events across great distances will be missed, but these are the events likely of utmost importance to population cohesion. Molecular work can be used to compensate for this limitation; I hope to isolate **microsatellite** markers (hyper-variable simple sequence repeats, or SSRs) in a common marine invertebrate, and then use these highly sensitive genetic markers to infer how much gene flow actually occurs between populations of several species with different reproductive strategies. The use of these sensitive genetic markers should allow me to calculate the realized amount of gene flow among populations rather than relying on estimates inferred from imperfect tracking data. Subsequent collections of adults along the shore will allow me to determine the origin of larvae and, by examining patterns of genetic identity through time, infer the transport mechanisms responsible for their arrival. By combining the ability to identify larvae genetically and assign them back to the population that produced them, I expect to be able to provide previously unavailable insight into the importance of the larval stage to the evolution and overall population dynamics of marine organisms.

The Center for Population Biology provides an ideal environment to complete this type of research, and I have already been in contact with Prof. Rick Grosberg about joining his lab to work on this project. I believe UC Davis would provide me with the best possible training in evolutionary and population biology. I have already completed a Masters degree in Marine Sciences & Oceanography, so I am now applying to the PBGG in anticipation of the rigorous training I will receive to complement my previous education and make the multidisciplinary research program outlined here possible. Following completion of my graduate training, I hope to secure a faculty position at a major university, and I anticipate that the training and experience I will gain at UC Davis will make me a more competitive candidate in fulfilling that goal.