*This file is mostly now integrated into other notes or the JUNE 2016 draft, so probably don’t need to use it anymore.*

Seagrass habitats form spatially heterogeneous landscapes that support high secondary productivity and biodiversity. The spatial structure of seagrass landscapes could be contributing to high diversity through connectivity and metacommunity dynamics (Bostrom et al 2006, others). Though landscape processes are increasingly recognized as important in seagrass community ecology, whether spatial patterns of biodiversity reflect the patchiness of seagrass meadows in a landscape remains untested. Here, we tested whether patterns of eelgrass-associated invertebrate biodiversity are consistent with metacommunity processes across distinct meadows in a landscape. For 9 meadows in Barkley Sound, British Columbia, we quantified epifaunal biodiversity on eelgrass Zostera japonica, and tested the following hypotheses: after controlling for depth and edge effects, epifaunal diversity and composition i) vary randomly within meadows but ii) vary systematically among meadows in a pattern consistent with metacommunity structure reflecting abiotic factors including position in the watershed, meadow area, and fetch. Finally, we hypothesized that iii) variation among meadows would be consistent through time over a single summer season. We found that within meadows, invertebrates were non-randomly distributed, showing signals of greater intra-specific aggregation than expected by chance. Non-random distributions of epifauna are consistent with checkerboard patterns, but we did not detect a clear signal of other predictors (*but maybe of fetch…grazer abundance increased with exposure).* *Grazer / fetch pattern was stable over time, though signals of recruitment events by mussels are strong.*

No metacommunity structure emerged when we examined only epifaunal grazers, crustaceans or gastropods. Although there was not clear varation among meadows, two clusters of meadow composition types emerged:: ‘Marine’ meadows that were dominated numerically by grazers, and ‘fresher’ meadows with equal dominance of grazers and detritovores. [fetch?] Overall, these results suggest that physical (wave energy) or energy input (productivity), not salinity, meadow size, or proximity to each other, are dominating the drivers of eelgrass epifaunal biodiversity through changes in relative abundance more than changes in species presence or absence. Faunal assemblages are temporally dynamic and vary substantially within meadows, and we have shown here that meadows can be similar to each other in patterns that suggest that wave energy and dispersal may be important controls on biodiversity.

[literature on metacommunities suggests that productive areas are likely to have higher abundance. abundance did not explain % grazers or diversity]

main findings: for epifaunal inverts (yes and sometimes) there is evidence of a checkerboard pattern across all 9 sites. (can’t get ems to run on just 5 sites. ;o/). For epifauna = yes, we still see a checkerboard pattern with some suggestion that copepods, ampithoe, aoroides, phyllaplesia group differently from monocorphium. For taxa for which a meadow might be expected to be a local population, also get a checkerboard pattern, but no clear pairs of antagonistic species.

SACs suggest we have asymptoted.

Waiting for fetch data, but I think there is a pattern there of more grazers in higher energy sites, driven mostly by grazer abundance increase (not turnover), and some spatial variation in filter feeder (mussel) recruitment.

figures:

1. Map, maybe with meadow areas on it
2. Along our main axis (dfw? Position? Fetch?): total inverts, % grazers if interesting, richness and ENS?
3. One metacomm figure (july, all inverts)
4. Beta (spatial turnover)
5. Nmds (composition)

Tables:

1. Stats on linear models on diversity, abundance and rarefied richness.
2. EMS table – in results since it’s just checkerboard
3. Site info