Moreno, Melissa

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Summary #2

Paper 1: Brown et al. (2011) Benthic habitat mapping: a review of progress towards improved understanding of the spatial ecology of the seafloor using acoustic techniques. Estuarine, Coastal and Shelf Science, 92, 502-520.

-For review papers, only provide a short summary (about 300 words) of the review.

This review paper takes a look at the strategies and methods used to produce benthic habitat maps using biological sampling and acoustic remote sensing. The types of acoustic sensing are single- beam, multi- beam, and side scan sonar. The methods can be put into three categories 1) abiotic surrogate mapping, 2) assembler fist and predict later, and predict first and assemble later. The paper mentions other types or remote sensing such as aerial and satellite imagery that have also been used for remote sensing. Marine habitat mapping originally began as an extension of geological approach incorporating biological information pertaining to the sampling. The seafloor habitat mapping eventually started to present habitat characteristics in a gradation. The environmental data layers of different acoustic observations can be added to observe different habitat types. Acoustic backscatter is the most widely used form of remote-sensed data for benthic characterization and mapping. The SSS acoustic backscatter has been used for the many years to portion the seafloor into different surficial sediment types. The paper talks about how MBES is becoming a really popular survey tool because it can simultaneously collect seafloor bathymetry and backscatter information over the seafloor. Some of the bathymetric analysis approaches include finding benthic species and knowing their certain depths and topographic conditions. One of the strategies mentioned were to layer the surrogates to predict the likely life-history attributes of “successful” or “persistent” organisms within a given environmental domain. Some of the problems with the benthic spatial scale mentioned because of determining scale for the habitat between the layers especially between different acoustic sensors. The seafloor has been barely mapped so using surrogate layers from different acoustic instruments might be able to provide habitat information that would otherwise never be available.

1) How does the material presented in this paper relate to you (your interests/research/field of study/future career): could it be transferred into a context relevant to you?

This paper doesn’t really to my research. But, I am using aerial imagery to determine and predict shoreline loss. I’m using the imagery as proxy for biological sampling and measuring habitat types, in hopes to be able to save time and money.

2) Which figure do you think is the most important? Why?

The most important figure is Table 1. The Table does through all of the papers that the researchers reviewed and described their strategies and what they sampled. This figure can be really important for someone trying to look for a similar research design to their study to get more inspiration on their methods, models, and statistics.

3) List the concepts or terms that you did not understand based on the initial reading of the article, do a quick research on those, and describe the results of your research (e.g. definitions, examples, context).

I didn’t understand what *in situ* is. I looked it up and it says “in its original place”. This must mean that *in situ* is sampling done in the sampling location.

Paper 2: McArthur et al. (2010) On the use of abiotic surrogates to describe marine benthic biodiversity. Estuarine, Coastal and Shelf Science, 88, 21-32.

-For review papers, only provide a short summary (about 300 words) of the review.

This review paper emphasizes that testing the relationships between abiotic and biotic relationships might be an alternative to biological sampling. The paper emphasizes that physical and chemical properties of a system can act as surrogates, but only recently this intuitive notion has been studied. The researchers used spatial gradients, seabed substrate parameters, habitat complexity, disturbance, productivity and organic carbon to support in their relationship models. Some of their considerations where temporal variation, applicability of surrogates at varying spatial scale, and the utility of different sampling regimes. The paper also focuses on the idea that it is difficult to biologically sample benthic systems and that there isn’t much data since it benthic systems have poor historical coverage.

The paper discusses how using the biodiversity information in management decisions at different scales (local, national and global). It talks about that continually researching surrogates will increase the capacity to management marine resources with confidence. The paper continues to discuss the lands in Victoria (Australia) and how they were legally regarded as public land and how the government decided to protect many areas and habitats. They also discuss that many of the classification techniques used for geographic regionalization to explain the biotic realm are diverse and not uniform. There is no single classification methodology for this at the time of this paper.

During the synthesis the paper explains that there are some variables with direct influence on the presence abundance of benthic species such as temperature, salinity, and pH. The recommend using acoustic data because of recent advancement and the ability to map large area of the seafloor, generally has the greatest potential to be a surrogate for biological sampling.

1) How does the material presented in this paper relate to you (your interests/research/field of study/future career): could it be transferred into a context relevant to you?

Similar to the first paper answer. I think is doesn’t really relate but using proxy information might be a better way to determine habitat types is a great idea.

2) Which figure do you think is the most important? Why?

The most important figure is Figure 1. This figure shows a conceptual map of the drivers of biodiversity. This model shows the reader on how many of the abiotic factors might be able to estimate biological variables such as richness, abundance, species assemblages, and functional groups.

3) List the concepts or terms that you did not understand based on the initial reading of the article, do a quick research on those, and describe the results of your research (e.g. definitions, examples, context).

I had previously understood what spatial gradients were but they are referring to it in a different way in this paper. Spatial gradients, in the paper, means that they are using direct influence such as temperature, day length, and light penetration to serve as a proxy behind the abiotic and biotic patterns.