Mapping Anthropogenic Impacts on Marine Benthic Habitats
(Proposal for a GeoHab Special Issue of Continental Shelf Research)

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The natural conditions of many of the oceans' benthic habitats have been increasingly impacted by the expansion of human occupation on earth. Today, the waste and pollution generated by humans is being concentrated in the oceans and the input of CO_2 into the atmosphere is causing global warming along with sea level rise, which results in acidification of sea water and shifting seafloor conditions. Just in the last hundred years plastics have increased in unbelievable magnitudes and is now a major contributor to ocean pollution. The cumulative effect of hydrocarbon production to make plastic and the proliferation of the material is substantially impacting the oceans. Accelerated marine traffic from merchant shipping to recreational boating has increased the potential for oil spills and other toxic materials along with lost shipping containers, seafloor disturbances from anchoring and mooring, all brought about in the past 20 years by "globalization" of trade. Tourism, especially eco-tourism is stressing some of the ocean's most critical habitats. In addition, the global demand for more of earth's natural resources such as seabed minerals, fish, and energy along with the desires for renewable energy resources such as wind and tidal power are impacting critical seafloor habitats. In the last year the outbreak of the Covid-19 pandemic is generating tremendously large amounts of waste in the form of rubber gloves, masks, and other personal protective equipment (PPE), detritus that are making their way to the oceans. This onslaught will have significant deleterious effects on many marine benthic habitats.

We believe that this is the time to address the mounting problem of pollution and waste impacts on seafloor habitats. Although a single volume cannot focus on all of the mentioned problems, attention needs to be drawn to selected impacts through knowledgeable scientific seafloor mapping investigations using the most up-to-date mapping technologies and data processing software packages. We are in the process of accepting contributions to a special issue of Continental Shelf Research that will present mapping case histories and topical investigations that will highlight what is known today about the alterations of marine benthic habitats and what is to come in the future. Below we list potential topics along with some suggested paper titles that can reasonably be addressed in regard to

mapping efforts that illustrate some of the anthropogenic impacts to marine benthic substrate and benthic habitats. We are soliciting contributions from the GeoHab community and have already received interests and manuscripts from many potential contributors and anticipate approximately 18 months of time needed to produce a comprehensive special volume from the time of announcing the effort.

See suggested list of topics and paper titles to be addressed below:

- **Suggested Introductory papers**
  - Rationale for undertaking the publication
  - The problems – global warming, sea level rise, increased resources extraction, alternative energy production, fishing impacts, and the "pandemic"
  - History of pollution
  - What constitute an ephemeral habitat?
  - About the authors, GeoHab

- **Plastics in the Marine Environment – Seafloor and Coastal Concentrations and Habitat Disturbance**

  "Plastic as an artificial substrate – biological indicators of plastic concentration"
  "Concentration of plastics along beaches and the intertidal – impacts on sedimentation and recruitment habitats"
  "Micro-plastics as sediment"

- **Global Warming and Sea Level Rise – Alteration of Inter-Tidal and Sub-Tidal Habitats**

  "Shifting inter-tidal habitats and their impact on kelp and eelgrass meadows"
  "Migration of inter-tidal and sub-tidal habitats from changes in sea level"
  "Bottom current shifts and alteration of sand lance forage habitats"

- **Marine Shipping, Recreational Boating, and Impacts on Marine Benthic Habitats**
  "Artificial deep seafloor habitat formation from sinking shipping containers"
  "Anchor drags and mooring buoy movement in critical sub-tidal habitats"
  "Small boat prop scours and habitat disturbances in eelgrass meadows

- **Oil Spills – Substrate and Benthic Habitat Impacts from Floating and Sinking Hydrocarbons**

  “A mapping method to identify critical habitats during an oil spill – Pre-spill planning and seafloor mitigation scenarios for the San Juan Archipelago”
  “Triaging coastal and benthic habitats as a mitigation measure during an oil spill”
  “Tidal and wind considerations on oil spill impacts on inter-tidal and sub-tidal habitats”

- **Seafloor Mining – Alterations of Seafloor Habitats**
  “Alteration of a deep-water abyssal habitat from seafloor extraction of manganese nodules”
  “Seafloor disturbance from mining of black smokers”
  “Potential marine benthic habitat impacts from aggregate and sand mining”

- **Marine Alternative Energy Development – Impacts to Fisheries Habitats**
  “Impacts and benefits to demersal fish fishing grounds in California by wind farm development”
  “Mapping sub-tidal habitats for decision making of tidal turbine sites”
  “Wave buoy siting in critical habitat areas, south Pacific”

- **Concluding papers by Editors**
  “Future Waste”
  “Recommendations – what to expect in future and what can be done”

If you are interested in contributing a paper to one or more of the topics listed above could you submit an abstract for your potential manuscript and send it to one or more of the following editors. We are looking to have about 20 contributions and would appreciate you notifying us of any interest you may have no later than June 15, 2022. Thank you.

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