In Depths

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Abstract
Stretching hydrophone recordings of diverse marine life with the whirring noises of radars and excavation equipment, In Depths is an acoustic exploration of deep sea entanglement, through which subterranean soundscapes echo and resound from the abyssopelagic to the ocean surface. Drawing upon Stacy Alaimo's notion of abyssal temporalities, In Depths uses time-stretching production techniques to contemplate subaquatic assemblages, consider the cumulative costs of deep sea mining, and value temporalities of slowness in resistance to the accelerating rhythms of resource extraction.

Keywords
soundscapes, abyssal temporalities, blue humanities, entanglement

Encompassing a diverse mosaic of terrains and life-forms, the deep-sea biosphere is the largest ecosystem on earth (Danovaro et al., 2017). The abyssal zone is home to a wide network of species from benthic fauna to cetaceans, and the myriad functions it provides helps to sustain pelagic, marine shallow, and terrestrial communities (Thurber et al., 2013).

Nevertheless, the increasing interest in Deep Sea Mining (DSM) operations gravely threatens these complex yet precarious habitats. Mining exploration licenses have already

been granted to UK Seabed Resources and Canadian firm The Metals Company, despite widespread calls for a moratorium on mineral extraction until more is known about abyssal ecosystems and the potentially devastating impacts of DSM.

Protecting the ocean floor first requires us to consider the prolonged timescales of the more-than-human depths, defined by Stacy Alaimo as its "abyssal temporalities" (Alaimo, 2017, p. 154). Deep sea fish species have longer lives and extremely slow reproduction rates, whilst bio-structures nestling in the subterrain take millions of years to form (Beckman, 2013, p. 277). As DSM operations harvest mineral rich polymetallic nodules from the seabed, abyssal temporalities will be compressed into anthropocenic time, expeditiously damaging subaquatic ecosystems and deteriorating the marine and coastal communities which depend on them.

Drawing upon the notion of abyssal temporalities and the deep listening sound practice of Pauline Oliveros, *In Depths* uses a production process of extreme sound stretching and "spectral smoothing" to contemplate subaquatic assemblages and timescales, and consider the cumulative costs of deep sea mining. (The production software used in this project, *Paul's Extreme Sound Stretch*, allows users to "stretch" an audio sample up to one thousand billion times its original length: https://hypermammut.sourceforge.net/paulstretch/.)

Stretching hydrophone recordings of diverse marine life with the whirring noises of radars and excavation equipment, *In Depths* is an acoustic exploration of deep sea entanglement, through which multispecies voices echo and resound from the abyssopelagic to the ocean surface.

By listening *through* the abyss, we can expand upon auditory "dimensions of awareness" (Oliveros, 2005, p. xxiii), refute portrayals of an "intact and uncompromised" ocean floor untouched by anthropogenic activity, and value temporalities of slowness in resistance to the accelerating rhythms of resource extraction (Alaimo, 2014, p. 196).

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Conflicts of Interest
The research was conducted in the absence of any conflicts of interest.

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About the Authors

George Hiraoka Cloke is a PhD student and artist based at SOAS, UK. His academic research focuses on representations of rivers in contemporary Southeast Asian ecocinema. As a musician and audio-visual artist, his creative practice integrates notions of ecological awareness, attentive listening and acoustic imagination. His music has been featured on BBC Radio 1, 6 Music, NTS and Spotify Editorial, and his audio-visual works have been exhibited at film festivals and art showcases worldwide.

Anna Luy Tan is a documentary filmmaker and writer from Chicago. As a student of both the sciences and the humanities with a lifelong passion for coral reef ecosystems, she has always been intensely invested in sharing her love of this unique living environment with the world and believes that it can be uniquely communicated through the medium of film.