15 GLOSSARY, ABBREVIATIONS & ACRONYMS

15.1 Glossary

TERM	DEFINITION
Allseas	Allseas Group S.A. is a Swiss-based offshore contractor specialising in subsea construction and strategic partner with NORI designing the PCV and riser system.
Collector Test	Testing of the prototype collector vehicle (PCV), nodule processing system, the nodule riser system, surface processing onboard the SSV and the discharge of the return water.
Collector Test EIA	Environmental Impact Assessment of activities associated with the Collector Test, a sub-component of the commercial ESIA.
Collector Test EIS	Environmental Impact Statement provides a description of the Project, the potential environmental impacts, environmental risks and hazards, risk management measures and monitoring programs relating to the Collector Test (i.e., the current document)
Production (mid-water) plume	The plume generated by the return of surface processing water into the water column at -1,200 m during system testing (i.e., nodule production)
Operational (benthic) plume	The plume generated by the PCV at the seabed during system testing (i.e., nodule production)
commercial EIS	Commercial Environmental Impact Statement that will be conducted as part of NORI's application for a commercial mining contract
commercial EMMP	Commercial Environmental Management and Monitoring Plan
commercial ESIA	Environmental and Social Impact Assessment conducted in support of NORI's application for a commercial permit to the ISA
nodule production	Nodules collected by the PCV, processed, and transported to the SSV via the riser system. This will create an Operational (benthic) plume. Nodules will undergo surface processing and the return water will be discharged. This discharge will create a Production (mid-water) plume.
nodule processing system	Separation of nodules from sediment within the PCV (i.e., on the seafloor)
surface processing	Separation of nodules from water, nodule fragments and/or entrained sediments. Generates the return water.
Sediment spill	Sediment generated by an activity or system component
TF (Area 6)	A 2 km x 4 km sub-division of the Pilot Mining Area in which Collector Test operations will be conducted.
Wider NORI-D	Sample locations outside of the CTA and/or PRZ

15.2 Abbreviations & Acronyms

ABBREVIATION/ ACRONYM	DEFINITION
ADCP	Acoustic doppler current profiler
Ag	Silver
ALARP	As low as reasonably practicable
APEI	Area of particular environmental interest
APP	Application
Au	Gold
AUV	Autonomous underwater vehicle

ABBREVIATION/ ACRONYM	DEFINITION
BACI	Before-After-Control-Impact
bar	Metric unit of pressure
BBL	Benthic Boundary Layer
Ca	Cadmium
CCZ	Clarion-Clipperton zone
CLARA	Clustering large applications
cm	Centimetre
Co	Cobalt
CTA	Collector Test Area
CTD	Conductivity temperature depth
Cu	Copper
DO	Dissolved oxygen
DOC	Dissolved organic carbon
DP	Dynamic Positioning
DVL	Doppler velocity log
DWT	Deadweight tonnage
EcoQS	Ecological quality status
eDNA	Environmental Deoxyribonucleic Acid
EIA	Environmental impact assessment
EIS	Environmental impact statement
EMMP	Environmental monitoring and management plan
ERL	Effects range low
ERM	Effects range medium
ERP	Emergency response plan
ESIA	Environmental and social impact assessment
et al	And others
FMECA	Failure Mode Effects Criticality Analyses
Fe	Iron
g	Gram
GEBCO	General bathymetric chart of the oceans
GHG	Greenhouse gas
HAT	Harbour Acceptance Trial
HD	Hydrodynamic
HIRA	Hazard Identification and Risk Assessment
HPU	Hydraulic power unit
HYCOM	Hybrid Coordinate Ocean Model
ICP-MS	Inductively coupled plasma mass spectrometry
IMO	International maritime organisation
INS	Inertial navigation system
IRZ	Impact reference zone
ISA	International seabed authority
ITCZ	Intertropical convergence zone
kg	Kilogram
kg/m2	Kilograms per square metre
kHz	Kilohertz
km	Kilometre
km^2	Square Kilometre
kW	Kilowatt
l	Litre

ABBREVIATION/ ACRONYM	DEFINITION
LARS	Launch And Recovery System
Lat	Latitude
LBL	Long Baseline Acoustic Positioning System
Long	Longitude
m	Metre
m/s	Metres Per Second
m^3/s	Cubic Metres Per Second
MARPOL	International Convention for the Prevention of Pollution from Ships
MBES	Multibeam Echosounder
mbsl	Metres Below Sea Level
MEDEVAC	Emergency Medical Evacuation
metocean	Meteorology And (Physical) Oceanography.
mg	Milligram
mg/l	Milligrams Per Litre
MI	Maturity Index
mm	Millimetre
Mn	Manganese
MW	Megawatt
NECC	North Equatorial Counter Current
NH_4^+	Ammonia
Ni	Nickel
NO_2^-	Nitrite
NO_3^-	Nitrate
NORI	Nauru Ocean Resources Inc
NORI-D	Nauru Ocean Resources Inc Contract Area D
NTU	Nephelometric Turbidity Units
OMZ	Oxygen Minimum Zone
OSPAR	Convention for the Protection of the Marine Environment of the North-East Atlantic
OTUs	Operational Taxonomic Units
PC	Particulate Carbon
POC	Particulate Organic Carbon
PCV	Prototype Collector Vehicle
pH	Measure of Acidity/Alkalinity
PK	Zero-To-Peak Sound Pressure Level
PO_4^{3-}	Phosphate
PRZ	Preservation Reference Zone
PSSA	Particularly Sensitive Sea Areas
psu	Practical Salinity Unit
PTS	Permenant Threshold Shift
ROV	Remotely Operated Vehicle
SAR	Static Acoustic Recorder
SAT	Sea Acceptance Trial
SCOC	Sediment Community Oxygen Consumption
SiO2	Silica
SLAM	Simultaneous Localisation And Mapping
SOFAR	Sound Fixing and Ranging Channel (Brand Name)
SPL	Sound Pressure Level
SSV	Surface Support Vessel
TC	Total Carbon

ABBREVIATION/ ACRONYM	DEFINITION
TDI	Trophic Diversity Index
TF	Test Field
TIC	Total Inorganic Carbon
TOC	Total Organic Carbon
TOML	Tonga Offshore Mining Limited
TSS	Total Suspended Solids
TTS	Temporary Threshold Shift
USBL	Ultrashort Baseline Acoustic Position System
VEC	Valued Ecosystem Component
W	Watt
WET	Whole Effluent Toxicity
WND	Wider NORI-D
Zn	Zinc
µg/l	Micrograms Per Litre
<	Less than
≤	Less than or equal to
>	Greater than
≥	Greater than or equal to

16 STUDY TEAM

The following people have contributed to writing sections of this EIS.

Table 16-1. Study team & section contributors

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11. Risk Prioritization	Multiple
12. Environmental Management, Monitoring & Reporting	Michael Clarke
13. Consultation & Review	Multiple
14. Conclusions & Recommendations	Multiple
15. Glossary, Abbreviations & Acronyms	N/A
16. Study Team	N/A
17. References	N/A
18. Appendices	N/A

17 REFERENCES

Aguilera, D.R., Jourabchi, P., Spiteri, C. and Regnier, P., 2005. A knowledge-based reactive transport approach for the simulation of biogeochemical dynamics in Earth systems. Geochemistry, Geophysics, Geosystems, 6(7).

Aleynik, D., Inall, M.E., Dale, A. and Vink, A., 2017. Impact of remotely generated eddies on plume dispersion at abyssal mining sites in the Pacific. Scientific reports, 7(1), pp.1-14.

Allseas, 2020a. Pilot Collector Test Report. NORI Area D. Clarion Clipperton Zone.

Allseas, 2020b. Discharge temperature analysis (Technical Note No. EQ-916AB 200-G-M-001), 770001 – Pilot mining test.

Allseas, 2021. Discharge depth analysis. Document no: EQ-916AB 200-G-R-003 Rev A

Alve, E., Korsun, S., Schönfeld, J., Dijkstra, N., Golikova, E., Hess, S., Husum, K., Panieri, G., 2015. Foram-AMBI: A sensitivity index based on benthic foraminiferal faunas from North-East Atlantic and Arctic fjords, continental shelves and slopes. Marine Micropaleontology 122. https://doi.org/10.1016/j.marmicro.2015.11.001

AMC. 2019. NORI Area D Clarion Clipperton Zone Mineral Resource Estimate. Technical Report for Deep Green Metals, Inc. AMC Project 318010. April 2019. AMC Consultants Pty Ltd, Brisbane, Qld 4000, Australia.

Amon, Diva J., Amanda F. Ziegler, Thomas G. Dahlgren, Adrian G. Glover, Aurélie Goineau, Andrew J. Gooday, Helena Wiklund, and Craig R. Smith. 2016. 'Insights into the Abundance and Diversity of Abyssal Megafauna in a Polymetallic-Nodule Region in the Eastern Clarion-Clipperton Zone'. Scientific Reports 6 (1): 30492.

Amon, Diva, Amanda Ziegler, Jeffrey Drazen, Andrei Grischenko, Astrid Leitner, Dhugal Lindsay, Janet Voight, Mary Wicksten, Craig Young, and Craig Smith. 2017. 'Megafauna of the UKSRL Exploration Contract Area and Eastern Clarion-Clipperton Zone in the Pacific Ocean: Annelida, Arthropoda, Bryozoa, Chordata, Ctenophora, Mollusca'. Biodiversity Data Journal 5 (August): e14598.

Andrew, N., and Mapstone, B., 1987. Sampling and the description of spatial pattern in marine ecology. In M. Barnes (Ed.), Oceanography and Marine Biology; Annual Review, Vol. 25 (pp. 39-90): Aberdeen University Press.

Ardron, J. A., Simon-Lledó, E., Jones, D. O., & Ruhl, H. A. 2019. Detecting the effects of deep-seabed nodule mining: simulations using megafaunal data from the Clarion-Clipperton Zone. Frontiers in Marine Science, 6, 604.

Ariza A, Garijo J, Landeira J, Bordes F, Hernández-León S (2015) Migrant biomass and respiratory carbon flux by zooplankton and micronekton in the subtropical northeast Atlantic Ocean (Canary Islands). Prog Oceanogr 134:330-342

Ariza, Alejandro, Kaartvedt, Stein, Rostad, Anders, Garijo, Juan Carlos, Aristegui, Javier, Fraile-Nuez, Eugenio, Hernandez-Leon, S. (2014). The Submarine Volcano Eruption off El Hierro Island: Effects on the Scattering Migrant Biota and the Evolution of the Pelagic Communities. PLoS One 9, e102354.

Armstrong, C. W., Foley, N. S., Tinch, R., & van den Hove, S. 2012. Services from the deep: Steps towards valuation of deep-sea goods and services. Ecosystem Services. 2:2-13.

Atwood, T. B., Witt, A., Mayorga, J., Hammill, E., & Sala, E. 2020. Global patterns in marine sediment carbon stocks. Frontiers in Marine Science, 7, 165.

Auguste, M., Mestre, N.C., Rocha, T.L., Cardoso, C., Cueff-Gauchard, V., Le Bloa, S., Cambon-Bonavita, M.A., Shillito, B., Zbinden, M., Ravaux, J. and Bebianno, M.J., 2016. Development of an ecotoxicological protocol for the deep-sea fauna using the hydrothermal vent shrimp Rimicaris exoculata. Aquatic Toxicology, 175, pp.277-285.

Bakun, A. (2007). Fronts and eddies as key structures in the habitat of marine fish larvae: opportunity, adaptive response and competitive advantage. Sci. Mar. 70, 105–122. Available at: http://scientiamarina.revistas.csic.es/index.php/scientiamarina/article/view/171.

Ballance, L., Pitman, R., and Fiedler, P. 2006. Oceanographic influences on seabirds and cetaceans of the eastern tropical Pacific: A review. Progress in Oceanography, 69: 360- 390.

Barckhausen, U., Bagge, M. and Wilson, D.S., 2013. Seafloor spreading anomalies and crustal ages of the Clarion-Clipperton Zone. Marine Geophysical Research, 34(2), pp.79-88.

Barlow, Jay, Megan C. Ferguson, Elizabeth A. Becker, Jessica V. Redfern, Karin A. Forney, Ignacio L. Vilchis, Paul C. Fiedler, Tim Gerrodette, and Lisa T. Ballance. 2009. 'Final Technical Report: Predictive Modelling of Cetacean Densities in the Eastern Pacific Ocean'. Prepared for the U.S. Department of Defense, Strategic Environmental Research and Development Program By the U.S. Department of Commerce, NOAA Fisheries, Southwest Fisheries Science Center., 227.

Barnett, M. A. 1984. 'Mesopelagic Fish Zoogeography in the Central Tropical and Subtropical Pacific Ocean: Species Composition and Structure at Representative Locations in Three Ecosystems'. Marine Biology 82 (2): 199–208.

Barone, B., Nicholson, D. P., Ferrón, S., Firing, E. and Karl, D. M. (2019). The estimation of gross oxygen production and community respiration from autonomous time-series measurements in the oligotrophic ocean. Limnology and Oceanography: Methods, 17(12), 650–664. https://doi.org/10.1002/lom3.10340

Bassett, C., Lavery, A. C., Stanton, T. K., and Cotter, E. D. (2020). Frequency- and depth-dependent target strength measurements of individual mesopelagic scatterers. 153. doi:10.1121/10.0001745.

Bath, A., Shackleton, B., Botica, C., 2004. Development of temperature criteria for marine discharge from a large industrial seawater supplies project in Western Australia. Water S.A 30.

Behrenfeld, MJ, PG Falkowski (1997) Photosynthetic rates derived from satellite-based chlorophyll concentration. Limnology and Oceanography. Volume 42: 1-20

Benoist, N.M.A., Bett, B.J., Morris, K.J., Ruhl, H.A., 2019. A generalised volumetric method to estimate the biomass of photographically surveyed benthic megafauna. Progress in Oceanography, 178, 102188.

Berelson, W.M., Anderson, R.F., Dymond, J., Demaster, D., Hammond, D.E., Collier, R., Honjo, S., Leinen, M., McManus, J., Pope, R. and Smith, C. (1997). Biogenic budgets of particle rain, benthic remineralization and sediment accumulation in the equatorial Pacific. Deep Sea Research Part II: Topical Studies in Oceanography, 44(9-10), pp.2251-2282.

BGR. 2018. Environmental Impact Assessment for the testing of collector components in the German license area. Hannover, 15. February 2018

Bianchi, A., Garcin, J. and Tholosan, O., 1999. A high-pressure serial sampler to measure microbial activity in the deep sea. _Deep Sea Research Part I: Oceanographic Research Papers_, _46_(12), pp.2129-2142.

Bidigare, R.R., Van Heukelem, L., Trees, C.C., 2005. Analysis of algal pigments by high- performance liquid chromatography. Algal culturing techniques, 327-345.

Bik, Holly M, W Kelley Thomas, David H Lunt, and P John D Lambshead. 2010. 'Low Endemism, Continued Deep-Shallow Interchanges, and Evidence for Cosmopolitan Distributions in Free-Living Marine Nematodes (Order Enoplida)'. BMC Evolutionary Biology 10 (1): 389.

Bik, Holly M., Way Sung, Paul De Ley, James G. Baldwin, Jyotsna Sharma, Axayácatl Rocha-Olivares, and W. Kelley Thomas. 2012. 'Metagenetic Community Analysis of Microbial Eukaryotes Illuminates Biogeographic Patterns in Deep-Sea and Shallow Water Sediments: METAGENETIC COMMUNITY ANALYSIS'. Molecular Ecology 21 (5): 1048–59.

Black, A. 2005. Light induced seabird mortality on vessels operating in the Southern Ocean: Incidents and mitigation measures. Antarct. Sci. 2005, 17, 67–68.

Block, B., Jonsen, I., Jorgensen, S. _et al._ 2011. Tracking apex marine predator movements in a dynamic ocean. _Nature_ 475, 86–90 (2011). https://doi.org/10.1038/nature10082

Borja, A., Franco, J., Pérez, V., 2000. A Marine Biotic Index to Establish the Ecological Quality of Soft-Bottom Benthos Within European Estuarine and Coastal Environments. Marine Pollution Bulletin 40, 1100–1114. https://doi.org/10.1016/S0025-326X(00)00061-8

Borowski, Christian, and Hjalmar Thiel. 1998. 'Deep-Sea Macrofaunal Impacts of a Large-Scale Physical Disturbance Experiment in the Southeast Pacific'. Deep-sea Research Part II: Topical Studies in Oceanography 45 (1–3): 55–81.

Boyd, Philip W., Hervé Claustre, Marina Levy, David A. Siegel, and Thomas Weber. 2019. 'Multi-Faceted Particle Pumps Drive Carbon Sequestration in the Ocean'. Nature 568 (7752): 327–35.

Boyle, E., Lee, J.-M., Echegoyen, Y., Noble, A., Moos, S., Carrasco, G., _et al._ (2014). Anthropogenic Lead Emissions in the Ocean: The evolving global experiment. Oceanography, 69(1), 69-75.

Bradley CJ, Wallsgrove NJ, Choy CA, Drazen JC, Hetherington ED, Hoen DK, Popp BN (2015) Trophic position estimates of marine teleosts using amino acid compound specific isotopic analysis. Limnology and Oceanography: Methods 13:476-493. doi:10.1002/lom3.10041

Breitburg, D., Levin, L.A., Oschlies, A., Grégoire, M., Chavez, F.P., Conley, D.J., Garçon, V., Gilbert, D., Gutiérrez, D., Isensee, K., Jacinto, G.S., Limburg, K.E., Montes, I., Naqvi, S.W.A., Pitcher, G.C., Rabalais, N.N., Roman, M.R., Rose, K.A., Seibel, B.A., Telszewski, M., Yasuhara, M., Zhang, J., 2018. Declining oxygen in the global ocean and coastal waters. Science. https://doi.org/10.1126/science.aam7240

Brix S, Osborn KJ, Kaiser S, Truskey SB, Schnurr SM, Brenke N, Malyutina M, Martinez Arbizu P. Adult life strategy affects distribution patterns in abyssal isopods–implications for conservation in Pacific nodule areas. 2020. Biogeosciences, 17(23), pp.6163-6184. Carr CM, Hardy SM, Brown TM, Macdonald TA, Hebert PD. A tri-oceanic perspective: DNA barcoding reveals geographic structure and cryptic diversity in Canadian polychaetes. PLoS ONE. 2011;6:e22232.

Brodeur RD, Yamamura O (eds) (2005) Micronekton of the North Pacific. PICES Scientific Report No. 30, vol 30. PICES Scientific Report No. 30. North Pacific Marine Science Organization (PICES),

Brown, A., Hauton, C., 2018. Ecotoxicological responses to chalcopyrite exposure in a proxy for deep-sea hydrothermal vent shrimp: implications for seafloor massive sulphide mining. Chemistry and Ecology 34, 391-396.

Brown, A., Thatje, S. and Hauton, C. (2017). The Effects of Temperature and Hydrostatic Pressure on Metal Toxicity: Insights into Toxicity in the Deep Sea. Environmental Science and Technology, 51(17), pp.10222–10231. [Online]. Available at: doi:10.1021/acs.est.7b02988.

Brown, A., Thatje, S., Martinez, A., Pond, D. and Oliphant, A. (2019). The effect of high hydrostatic pressure acclimation on acute temperature tolerance and phospholipid fatty acid composition in the shallow-water shrimp Palaemon varians. Journal of Experimental Marine Biology and Ecology, 514–515(November 2018), Elsevier., pp.103–109. [Online]. Available at: doi:10.1016/j.jembe.2019.03.011.

Brown, Alastair, Roseanna Wright, Lisa Mevenkamp, and Chris Hauton. 2017. 'A Comparative Experimental Approach to Ecotoxicology in Shallow-Water and Deep-Sea Holothurians Suggests Similar Behavioural Responses'. Aquatic Toxicology 191 (October): 10–16.

Buckland, S.T., Anderson, D.R., Burnham, K.P., Laake, J.L., Borchers, D.L., Thomas, L., 2001. Introduction to Distance Sampling: Estimating Abundance of Biological Populations. Oxford: Oxford University Press.

Bundesanstalt fur Geowissenschaften und Rohstoffe (BGR). 2019. Federal Institute for Geosciences and Natural Resources. Environmental Impact Assessment. Testing of a pre-protoype manganese nodule collector vehicle in the Eastern German license area (Clarion-Clipperton Zone) in the framework of the European JPI-O Mining Impact 2 research project.

Bussau, C., Schriever, G., Thiel, H., 1995. Evaluation of abyssal metazoan meiofauna from a manganese nodule area of the eastern South Pacific. Vie et Milieu/Life & Environment, 39-48.

CEAA, 1992. Canadian Environmental Assessment Agency. Reference Guide: Determining Whether a Project is Likely to Cause Significant Adverse Environmental Effects. Québec, Canada, 1992.

Chikaraishi Y, Ogawa NO, Kashiyama Y, Takano Y, Suga H, Tomitani A, Miyashita H, Kitazato H, Ohkouchi N (2009a) Determination of aquatic food-web structure based on compound-specific nitrogen isotopic composition of amino acids. Limnology and Oceanography: Methods 7:740-750

Chikaraishi Y, Ogawa NO, Kashiyama Y, Takano Y, Suga H, Tomitani A, Miyashita H, Kitazato H, Ohkouchi N (2009a) Determination of aquatic food-web structure based on compound-specific nitrogen isotopic composition of amino acids. Limnology and Oceanography: Methods 7:740-750

Childress, J.J., Seibel, B.A., 1998. Life at stable low oxygen levels: adaptations of animals to oceanic oxygen minimum layers. The Journal of experimental biology 201, 1223–1232.

Chin, A. & Hari., K. 2020. Predicting the impacts of mining of deep sea polymetallic nodules in the Pacific Ocean: A review of scientific literature. Canada: Deep Sea Mining Campaign and Mining Watch.

Choy CA, Popp BN, Hannides CCS, Drazen JC (2015) Trophic structure and food resources of epipelagic and mesopelagic fishes in the North Pacific Subtropical Gyre ecosystem inferred from nitrogen isotopic compositions. Limnol Oceanogr 60:1156-1171

Choy, C. Anela, Brian N. Popp, Cecelia C. S. Hannides, and Jeffrey C. Drazen. 2015. 'Trophic Structure and Food Resources of Epipelagic and Mesopelagic Fishes in the North Pacific Subtropical Gyre Ecosystem Inferred from Nitrogen Isotopic Compositions'. Limnology and Oceanography 60 (4): 1156–71.

Christiansen, B., Denda, A., Christiansen, S., 2020. Potential effects of deep seabed mining on pelagic and benthopelagic biota. Marine Policy, Environmental governance of deep seabed mining - scientific insights and food for thought 114, 103442. https://doi.org/10.1016/j.marpol.2019.02.014

Chuar, Cheah Hoay, Samantha Jia Wen Tong, Chee Kong Chim, Helen Pei San Wong, and Koh Siang Tan. 2020. 'Abyssal Macrofaunal Community Structure in the Polymetallic Nodule Exploration Area at the Easternmost Region of the Clarion-Clipperton Fracture Zone, Pacific Ocean'. Deep-sea Research Part I: Oceanographic Research Papers 161 (July): 103284.

Clark, M. R., Rowden, A. A., Schlacher, T., Williams, A., Consalvey, M., Stocks, K. I., Rogers, A. D., O'Hara, T. D., White, M., Shank, T. M., Hall-Spencer, J. M. 2009. The ecology of seamounts: structure, function, and human impacts. Annual Review of Marine Science, 2: 253–278.

Clarke KR, Gorley RN (2006) PRIMER v6: User Manual and Tutorial. PRIMER-E Ltd., Plymouth, UK

Clarke TA (1973) Some aspects of the ecology of lanternfishes (Myctophidae) in the Pacific Ocean near Hawaii. Fish Bull 71:401-434

Clarke, Thomas A. 1987. 'The Distribution of Vertically Migrating Fishes Across the Central Equatorial Pacific', 36.

Clipperton Zone, Pacific Ocean. Earth and Planetary Science Letters 532, 116012.

CMST (2020). Bioacoustic analysis of underwater sound recordings collected in the NORI-D: Preliminary analysis and workflow development (Milstone 1). Report to Fathom Pacific Pty Ltd by Curtin University's Centre for Marine Science and Technology.

Collin, S. p., Marshall, N. j., Chamberlain, S.C., 2000. Vision in hydrothermal vent shrimp. Philosophical Transactions of the Royal Society of London. Series B: Biological Sciences 355, 1151–1154. https://doi.org/10.1098/rstb.2000.0657.

Conley, K.R., Lombard, F., Sutherland, K.R., 2018. Mammoth grazers on the ocean's minuteness: A review of selective feeding using mucous meshes. Proc. Biol. Sci. 285, 20180056

Conway, T. M., & John, S. G. 2015. The cycling of iron, zinc and cadmium in the North East Pacific Ocean - Insights from stable isotopes. Geochimica et Cosmochimica Acta, 164, 262-283.

Copley, J.T.P., Jorgensen, P.B.K., Sohn, R.A., 2007. Assessment of decadal-scale ecological change at a deep Mid-Atlantic hydrothermal vent and reproductive time-series in the shrimp Rimicaris exoculata. Journal of the Marine Biological Association of the United Kingdom 87, 859–867. https://doi.org/10.1017/S0025315407056512

Craig, H., Hayward, T., 1987. Oxygen supersaturation in the ocean-biological versus physical contributions. Science 235, 199-202.

Crain, CM, Kroeker K, Halpern BS. 2008, Interactive and cumulative effects of multiple human stressors in marine systems. Ecology Letters. 11(2):1304-1315.

Cravatte, S., Kestenare, E., Marin, F., Dutrieux, P., and Firing, E. (2017). Subthermocline and intermediate zonal currents in the tropical Pacific Ocean: Paths and vertical structure. J. Phys. Oceanogr. 47, 2305–2324. doi:10.1175/JPO-D-17-0043.1.

CSA 2022. Nori-D Metocean and Seasonal Studies Environmental Program, Final Campaign 4E Field Survey Report. DRAFT - Report prepared by CSA Ocean Sciences Inc for Nauru Ocean Resources Inc., January 2022, 117 pp.

CSA 2020. Nori-D Metocean and Seasonal Studies Environmental Program, Final Campaign 4D Field Survey Report. Report prepared by CSA Ocean Sciences Inc for Nauru Ocean Resources Inc., December 2020, 127 pp.

CSA 2019. Nori-D Metocean and Seasonal Studies Environmental Program, Final Campaign 4A Field Survey Report. Report prepared by CSA Ocean Sciences Inc for Nauru Ocean Resources Inc., April 2019, 71 pp..

Cutter, G.A., Bruland, K.W., 2012. Rapid and noncontaminating sampling system for trace elements in global ocean surveys. Limnology and Oceanography: Methods 10 (6), 425-436.

Cuvelier, D., Ribeiro, P. A., Ramalho, S. P., Kersken, D., Martinez Arbizu, P., & Colaço, A. 2020. Are seamounts refuge areas for fauna from polymetallic nodule fields? Biogeosciences, 17(9) : 2657-2680.

Danovaro, R. 2010. Methods for the Study of Deep-Sea Sediments, Their Functioning and Biodiversity. New ed. Boca Raton (FL): CRC press.

Danovaro, R., Gambi, C., Dell'Anno, A., Corinaldesi, C., Fraschetti, S., Vanreusel, A., Vincx, M. and Gooday, A.J., 2008. Exponential decline of deep-sea ecosystem functioning linked to benthic biodiversity loss. Current Biology, 18(1), pp.1-8.

Danovaro, R., Snelgrove, P. V., & Tyler, P. 2014. Challenging the paradigms of deep-sea ecology. Trends in ecology & evolution. 29(8):465-75.

Dauwe, B., & Middelburg, J. J. 1998. Amino acids and hexosamines as indicators of organic matter degradation state in North Sea sediments. Limnology and Oceanography, 43(5), 782-798.

Davies, T.W.; Coleman, M.; Griffith, K.M.; Jenkins, S.R. 2015. Night-time lighting alters the composition of marine epifaunal communities. Biol. Lett. 2015, 11, 20150080.

Davies, T.W.; Duffy, J.P.; Bennie, J.; Gaston, K.J. 2014. The nature, extent, and ecological implications of marine light pollution. Front. Ecol. Environ. 2014, 12, 347–355.

Davies, T.W.; Duffy, J.P.; Bennie, J.; Gaston, K.J. 2016. Stemming the tide of light pollution encroaching into marine protected areas. Conserv. Lett. 2016, 9, 164–171.

Davison PC, Checkley Jr DM, Koslow JA, Barlow J (2013) Carbon export mediated by mesopelagic fishes in the northeast Pacific Ocean. Prog Oceanogr 116:14-30. doi:http://dx.doi.org/10.1016/j.pocean.2013.05.013

Davison, P. C., Koslow, J. A., and Kloser, R. J. (2015). Acoustic biomass estimation of mesopelagic fish: backscattering from individuals, populations, and communities. ICES J. Mar. Sci. 72, 1413–1424.

De Forest, Lisa, and Jeffrey Drazen. 2009. 'The Influence of a Hawaiian Seamount on Mesopelagic Micronekton'. Deep-sea Research Part I: Oceanographic Research Papers 56 (2): 232–50.

De Jonge, D.S., Stratmann, T., Lins, L., Vanreusel, A., Purser, A., Marcon, Y., Rodrigues, C.F., Ravara, A., Esquete, P., Cunha, M.R., 2020. Abyssal food-web model indicates faunal carbon flow recovery and impaired microbial loop 26 years after a sediment disturbance experiment. Progress in Oceanography 102446.

De Robertis, Alex; lawrence-slavas, Noah; Jenkins, Richard; Wangen, Ivar; Mordy, Calvin; Meinig, Christian; Levine, Mike; Peacock, Dave; Tabisola, H. (2019). Long-term measurements of fish backscatter from unmanned surface vehicles and comparison with observations from a noise-reduced research vessel. ICES J. Mar. Sci., 22.

De Smet, Bart, Ellen Pape, Torben Riehl, Paulo Bonifácio, Liesbet Colson, and Ann Vanreusel. 2017. 'The Community Structure of Deep-Sea Macrofauna Associated with Polymetallic Nodules in the Eastern Part of the Clarion-Clipperton Fracture Zone'. Frontiers in Marine Science 4 (April).

De Smet, Bart, Erik Simon-Lledó, Lisa Mevenkamp, Ellen Pape, Francesca Pasotti, Daniel O.B. Jones, and Ann Vanreusel. 2021. 'The Megafauna Community from an Abyssal Area of Interest for Mining of Polymetallic Nodules'. Deep-sea Research Part I: Oceanographic Research Papers 172 (June): 103530.

Dee, D.P., Uppala, S.M., Simmons, A.J., Berrisford, P., Poli, P., Kobayashi, S., Andrae, U., Balmaseda, M.A., Balsamo, G., Bauer, D.P. and Bechtold, P., 2011. The ERA-Interim reanalysis: Configuration and performance of the data assimilation system. Quarterly Journal of the royal meteorological society, 137(656), pp.553-597.

Della Penna, A., and Gaube, P. (2020). Mesoscale Eddies Structure Mesopelagic Communities. Front. Mar. Sci. 7, 1–9. doi:10.3389/fmars.2020.00454.

Demer, D. A., Berger, L., Bernasconi, M., Bethke, E., Boswell, K., Chu, D., et al. (2015). Calibration of acoustic instruments.

Demidova, T.A., Sokov, A.V. and Belyaev, A.M., 1993. The bottom currents in the area of abyssal hills in the north-east tropical Pacific Ocean. Physical Oceanography, 4(1), pp.53-61.

DeNiro MJ, Epstein S (1978) Influence of diet on the distribution of carbon isotopes in animals. Geochim Cosomochim Acta 42:495-506

Development of a dual-index sequencing strategy and curation pipeline for analyzing amplicon sequence data on the MiSeq Illumina sequencing platform. _Applied and Environmental Microbiology_, _79_(17), 5112–5120. https://doi.org/10.1128/AEM.01043-13.

DHI, 2021. NORI-D Pilot Collector Test Sediment Plume Modelling - Draft Report. Prepared for CSA Ocean Science Inc. Project number 41804716-01. Approval date 2021/04/05.

DHI. 2017. MIKE 3 Mud Transport Scientific Documentation, available at: https://manuals.mikepoweredbydhi.help/2017/MIKE_3.htm

DHI. 2022. NORI-D Pilot Collector Test Sediment Plume Modelling - Draft Report. Prepared for CSA Ocean Science Inc. Project number 41804716-01. Approval date 2022/01/30

DHI. 2021. NORI-D Pilot Collector Test Sediment Plume Modelling - Draft Report. Prepared for CSA Ocean Science Inc. Project number 41804716-01. Approval date 2021/04/05.

DOER. 2000. Improved Methods for Correlating Turbidity and Suspended Solids for Monitoring. ERDC-EN-DOER-2000 June 2000: https://cluin.org/download/contaminantfocus/sediments/turbidity.pdf

Doherty, S. C., A. E. Maas, D. K. Steinberg, B. N. Popp, and H. G. Close. 2021. Distinguishing zooplankton fecal pellets as a component of the biological pump using compound-specific isotope analysis of amino acids. Limnology and Oceanography.

Dong, Yi, Jinhua Li, Wuchang Zhang, Wenyan Zhang, Yuan Zhao, Tian Xiao, Long-Fei Wu, and Hongmiao Pan. 2016. 'The Detection of Magnetotactic Bacteria in Deep-sea Sediments from the East Pacific Manganese Nodule Province'. Environmental Microbiology Reports 8 (2): 239–49.

Dooling, R.J. and Therrien, S.C. 2012. Hearing in Birds: What Changes from Air to Water. Advances in Experimental Medicine and Biology. Springer New York. pp 77-82. doi.org/10.1007/978-1-4419-7311-5_17

Dornan, T., Fielding, S., Saunders, R. A., and Genner, M. J. (2019). Swimbladder morphology masks Southern Ocean mesopelagic fish biomass. Proc. R. Soc. B.

Drazen, J.C., Leitner, A.B., Jones, D.O.B., Simon-Lledó, E., 2021. Regional Variation in Communities of Demersal Fishes and Scavengers Across the CCZ and Pacific Ocean. Frontiers in Marine Science 8, 1110. https://doi.org/10.3389/fmars.2021.630616

Drazen, J.C., Popp, B.N., Choy, C.A., Clemente, T., Forest, L.D., Smith, K.L., 2008. Bypassing the abyssal benthic food web: Macrourid diet in the eastern North Pacific inferred from stomach content and stable isotopes analyses. Limnol. Oceanogr. 53, 2644–2654. https://doi.org/10.4319/lo.2008.53.6.2644

Drazen, J.C., Smith, C.R., Gjerde, K.M., Haddock, S.H., Carter, G.S., Choy, C.A., Clark, M.R., Dutrieux, P., Goetze, E., Hauton, C. and Hatta, M., 2020. Opinion: Mid-water ecosystems must be considered when evaluating environmental risks of deep-sea mining. Proceedings of the National Academy of Sciences, 117(30), pp.17455-17460.

Drazen, J.C., Sutton, T.T., 2017. Dining in the deep: The feeding ecology of deep-sea fishes. Annual Reviews in Marine Science 9, 337-366.

Drazen, Jeffrey C., Astrid B. Leitner, Sage Morningstar, Yann Marcon, Jens Greinert, and Autun Purser. 2019. 'Observations of Deep-Sea Fishes and Mobile Scavengers from the Abyssal DISCOL Experimental Mining Area'. Biogeosciences 16 (16): 3133–46.

Drazen, Jeffrey C., Lisa G. De Forest, and Reka Domokos. 2011. 'Micronekton Abundance and Biomass in Hawaiian Waters as Influenced by Seamounts, Eddies, and the Moon'. Deep-sea Research Part I: Oceanographic Research Papers 58 (5): 557–66.

Drazen, Jeffrey, Craig Smith, Kristina Gjerde, Whitlow Au, Jesse Black, Glenn Carter, Malcolm Clark, _et al._ 2019. 'Report of the Workshop Evaluating the Nature of Mid-water Mining Plumes and Their Potential Effects on Mid-water Ecosystems'. Research Ideas and Outcomes 5 (February): e33527.

Duarte CM, Chapuis L, Collin SP, Costa DP, Devassy RP, Eguiluz VM, Erbe C, Gordon TAC, Halpern BS, Harding HR, Havlik MN, Meekan M, Merchant ND, Miksis-Olds JL, Parsons M, Predragovic M, Radford AN, Radford CA, Simpson SD, Slabbekoorn H, Staaterman E, Van Opzeeland IC, Winderen J, Zhang X-G, Juanes F. 2021. The soundscape of the Anthropocene ocean. Science 371.

Dunlop, K.M., Van Oevelen, D., Ruhl, H.A., Huffard, C.L., Kuhnz, L.A. and Smith Jr, K.L. (2016). Carbon cycling in the deep eastern North Pacific benthic food web: Investigating the effect of organic carbon input. Limnology and Oceanography, 61(6), pp.1956-1968.

Dunne, J.P., Sarmiento, J.L. and Gnanadesikan, A. (2007). A synthesis of global particle export from the surface ocean and cycling through the ocean interior and on the seafloor. Global Biogeochemical Cycles, 21(4).

Dunson, W.A. and Travis, J., 1991. The role of abiotic factors in community organization. _The American Naturalist_, _138_(5), pp.1067-1091.

Durden, J. M., Bett, B. J., & Ruhl, H. A. 2020. Subtle variation in abyssal terrain induces significant change in benthic megafaunal abundance, diversity, and community structure. Progress in Oceanography, 186: 102395.

Durden, J. M., Bett, B. J., Jones, D. O., Huvenne, V. A., & Ruhl, H. A. 2015. Abyssal hills–hidden source of increased habitat heterogeneity, benthic megafaunal biomass and diversity in the deep-sea. Progress in Oceanography, 137: 209-218. NORI-D Habitat Mapping Project: Final Report 23.

Durden, J.M., Bett, B.J., Horton, T., Serpell-Stephens, A., Morris, K.J., Billett, D.S., 2016. Improving the estimation of deep-sea megabenthos biomass: dimension to wet weight conversions for abyssal invertebrates. Marine Ecology Progress Series, 552, 71-79.

Durden, J.M., Bett, B.J., Horton, T., Serpell-Stephens, A., Morris, K.J., Billett, D.S., 2016. Improving the estimation of deep-sea megabenthos biomass: dimension to wet weight conversions for abyssal invertebrates. Marine Ecology Progress Series, 552, 71-79.

Durden, J.M., Bett, B.J., Huffard, C.L., Ruhl, H.A., Smith, K.L., 2019. Abyssal deposit-feeding rates consistent with the metabolic theory of ecology. Ecology, 100, e02564.

Ehrlich. A and W, Ross. 2015. The significance spectrum and EIA significance determinations, Impact Assessment and Project Appraisal, 33:2, 87-97, DOI: 10.1080/14615517.2014.981023

Erbe C, Marley SA., Schoeman RP, Smith JN., Trigg LE., Embling CB, 2019. The effects of ship noise on marine mammals—A Review. Frontiers in Marine Science 6, 606.

Erbe, C, R. Dunlop, K. Curt S. Jenner, Micheline-N. M. Jenner, Robert D. McCauley, Iain Parnum, Miles Parsons, Tracey Rogers, and Chandra Salgado-Kent. 2017. 'Review of Underwater and In-Air Sounds Emitted by Australian and Antarctic Marine Mammals'. Acoustics Australia 45 (2): 179–241.

Erbe, C., Reichmuth, C., Cunningham, K., Lucke, K. and Dooling, R., 2016. Communication masking in marine mammals: A review and research strategy. Marine Pollution Bulletin, 103(1-2): 15-38.

ERIAS. 2020. Sediment Geochemistry Characterization. NORI Area D Campaign 3, Campaign 6A and Campaign 6B. May 2020. Report No. 01263A_11_v2

Etter, J.F., Cucherat, M. and Perneger, T.V., 2002. Questionnaire Color and Response Rates to Mailed Surveys: A Randomizedtrial Anda Meta-Analysis. _Evaluation & the health professions_, _25_(2), pp.185-199.

Evseenko, Sergei, and Maria Shtaut. 2005. 'On the Species Composition and Distribution of Ichthyoplankton and Micronekton in the Costa Rica Dome and Adjacent Areas of the Tropical Eastern Pacific [Originally Published in Russian in Voprosy Ikhtiologii v. 45 (4): 512-524].' Journal of Ichthyology 45 (January): 513–25.

Fanning L, Mahon R, Baldwin K, Douglas S. 2015. Transboundary Waters Assessment Programme (TWAP) Assessment of Governance Arrangements for the Ocean, Volume 1: Transboundary Large Marine Ecosystems. IOC-UNESCO, Paris. IOC Technical Series, 119: 80 pp

Fathom Pacific., 2020. NORI D Habitat Mapping Phase 2a Report: Substrate Classification – Nodule Substrate.

Fathom Pacific., 2020b. NORI D Surface Biology Literature Review.

Fathom Pacific.,2019a. NORI D Habitat Mapping, Phase 1 Report: Abiotic Habitat Classification.

Fathom Pacific.,2019b. NORI D Habitat Mapping Phase 2 Report: Substrate Classification

Fathom Pacific.,2020a. Deep scattering layer and diel vertical migration of scatters. NORI Area D. CCZ.

Fejer, A and A. Flynn 2021. Habitat Mapping for Ecosystem-Based Management of Deep-Sea Mining. Marine Technology Society Journal. Vol. 55. Number, 6 Nov/Dec 2021

Ferrón, S., Barone, B., Church, M. J., White, A. E., & Karl, D. M. (2021). Euphotic Zone Metabolism in the North Pacific Subtropical Gyre Based on Oxygen Dynamics. Global Biogeochemical Cycles, 35(3). https://doi.org/10.1029/2020GB006744

Ferrón, S., Wilson, S. T., Martínez-García, S., Quay, P. D., & Karl, D. M. (2015). Metabolic balance in the mixed layer of the oligotrophic North Pacific Ocean from diel changes in O2/Ar saturation ratios. Geophysical Research Letters, 42(9), 3421–3430. https://doi.org/10.1002/2015GL063555

Filippelli, G.M., 1997. Controls on phosphorus concentration and accumulation in oceanic sediments. Marine Geology, 139(1-4), pp.231-240.

Finneran, J.J. 2016. Auditory weighting functions and TTS/PTS exposure functions for marine mammals exposed to underwater noise. Appendix A, pp. 37-107. In: Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing. Underwater Acoustic Thresholds for Onset of Permanent and Temporary Threshold Shifts. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service. NOAA Technical Memorandum NMFS-OPR-55. July 2016.

Flynn, A. and Donnelly, D. 2021b. NORI-D: WP002 Surface Biology. Annual Report 2020-2021. Prepared by Fathom Pacific Pty Ltd for The Metals Company, Inc. November 2021. 111 pp.

Francesca, Pasotti, Lisa Mevenkamp, Ellen Pape, Magdalena Błażewicz, Paulo Bonifácio, Torben Riehl, Bart De Smet, Nene Lefaible, Lidia Lins, and Ann Vanreusel. 2021. 'A Local Scale Analysis of Manganese Nodules Influence on the Clarion-Clipperton Fracture Zone Macrobenthos'. Deep-sea Research Part I: Oceanographic Research Papers 168 (February): 103449.

Fugro. 2018. Geotechnical Seafloor Sampling Survey: Geotechnical Data Report. NORI D Area, Campaign 3 Test Mining Site, Clarion Clipperton Zone, Pacific Ocean. 12 November 2018. Fugro Report No. 1803-1344, Volume II. Draft. The Metals Company Metals Inc.

Gascuel, D., Morissette, L., Palomares, M. L. D., and Christensen, V. (2008). Trophic flow kinetics in marine ecosystems: toward a theoretical approach to ecosystem functioning. Ecol. Modell. 217, 33–47.

Gausepohl, F., Hennke, A., Schoening, T., Köser, K. and Greinert, J., 2020. Scars in the abyss: Reconstructing sequence, location and temporal change of the 78 plough tracks of the 1989 DISCOL deep-sea disturbance experiment in the Peru Basin. _Biogeosciences_, _17_(6), pp.1463-1493.

Gavrilov A.N. and Parsons M.J.G. 2014, "A MATLAB tool for the Characterisation Of Recorded Underwater Sound (CHORUS)", Acoustics Australia v.42, No.3, pp. 190-196.

Gloeckler, K. and others 2018a. Amino acid – compound specific stable isotope analysis of micronekton around Hawaii reveals the importance of suspended particles as an important nutritional source in the meso/bathypelagic. Limnol. Oceanogr. 63: 1168-1180.

Gloeckler, K., Choy, C.A., Hannides, C.C.S., Close, H.G., Goetze, E., Popp, B.N., Drazen, J.C. 2018. Stable isotope analysis of micronekton around Hawaii reveals suspended particles are an important nutritional

source in the lower mesopelagic and upper bathypelagic zones. Limnology and Oceanography, 63: 1168-1180.

Glover, A. G., Dahlgren, T. G., Wiklund, H., Mohrbeck, I., & Smith, C. R. 2016. An end-to-end DNA taxonomy methodology for benthic biodiversity survey in the Clarion-Clipperton Zone, central Pacific abyss. Journal of Marine Science and Engineering, 4(1), 2.

Glover, A.G., Smith, C.R., 2003. The deep-sea floor ecosystem: current status and prospects of anthropogenic change by the year 2025. Environ. Conserv. 30, 219–241.

Goineau, Aurélie, and Andrew J. Gooday. 2017. 'Novel Benthic Foraminifera Are Abundant and Diverse in an Area of the Abyssal Equatorial Pacific Licensed for Polymetallic Nodule Exploration'. Scientific Reports 7 (1): 45288.

Goineau, Aurélie, and Andrew J. Gooday. 2019. 'Diversity and Spatial Patterns of Foraminiferal Assemblages in the Eastern Clarion–Clipperton Zone (Abyssal Eastern Equatorial Pacific)'. Deep-sea Research Part I: Oceanographic Research Papers 149 (July): 103036.

Golder Associates, 2018. Technical Report For The NORI Clarion - Clipperton Zone Project, Pacific Ocean.

Gollner, S., Kaiser, S., Menzel, L., Jones, D.O.B., Brown, A., Mestre, N.C., van Oevelen, D., Menot, L., Colaco, A., Canals, M., Cuvelier, D., Durden, J.M., Gebruk, A., Egho, G.A., Haeckel, M., Marcon, Y., Mevenkamp, L., Morato, T., Pham, C.K., Purser, A., Sanchez-Vidal, A., Vanreusel, A., Vink, A., Martinez Arbizu, P. 2017. Resilience of benthic deep-sea fauna to mining activities. Marine Environmental Research 129, 76-101.

Gollner, S., Kaiser, S., Menzel, L., Jones, D.O.B., Brown, A., Mestre, N.C., van Oevelen, D., Menot, L., Colaço, A., Canals, M., Cuvelier, D., Durden, J.M., Gebruk, A., Egho, G.A., Haeckel, M., Marcon, Y., Mevenkamp, L., Morato, T., Pham, C.K., Purser, A., Sanchez-Vidal, A., Vanreusel, A., Vink, A., Martinez Arbizu, P., 2017. Resilience of benthic deep-sea fauna to mining activities. Marine Environmental Research 129, 76–101. https://doi.org/10.1016/j.marenvres.2017.04.010.

Gooday, A. J. (1996). Epifaunal and shallow infaunal foraminiferal communities at three abyssal NE Atlantic sites subject to differing phytodetritus input regimes. Deep Sea Research Part I: Oceanographic Research Papers, 43(9), 1395-1421.

Gooday, A. J., & Rathburn, A. E. (1999). Temporal variability in living deep-sea benthic foraminifera: a review. Earth-Science Reviews, 46(1-4), 187-212.

Gooday, A. J., Bett, B. J., Shires, R., & Lambshead, P. J. D. (1998). Deep-sea benthic foraminiferal species diversity in the NE Atlantic and NW Arabian Sea: a synthesis. Deep Sea Research Part II: Topical Studies in Oceanography, 45(1-3), 165-201.

Gooday, A.J., Goineau, A. and Voltski, I. 2015. Abyssal foraminifera attached to 1610 polymetallic nodules from the eastern Clarion Clipperton Fracture Zone: a 1611 preliminary description and comparison with North Atlantic dropstone assemblages. . 1612 Marine Biodiversity, 2015. 45(3): p. 391-412.

Gordon, J.D.M., Bergstad, O.A., Pascoe, P.L., 2002. The influence of artificial light on the capture of deep-water demersal fish by bottom trawling. Journal of the Marine Biological Association of the United Kingdom 82, 339–344. https://doi.org/10.1017/S0025315402005532

Grand, M. M., Measures, C. I., Hatta, M., Morton, P. L., Barrett, P., Milne, A., _et al._ 2015. The impact of circulation and dust deposition in controlling the distributions of dissolved Fe and Al in the south Indian subtropical gyre. Marine Chemistry, 176, 110-125.

Greenpeace International. 2019. In Deep Water. The emerging threat of deep sea mining. https://www.greenpeace.org/international/publication/22578/deep-sea-mining-in-deep-water/

Guan, S. and Brookens, T. 2021. The Use of Psychoacoustics in Marine Mammal Conservation in the United States: From Science to Management and Policy. Journal of Marine Science and Engineering, 9(5): 507. https://doi.org/10.3390/jmse9050507.

Haddock, Steven H.D., Mark A. Moline, and James F. Case. 2010. 'Bioluminescence in the Sea'. Annual Review of Marine Science 2 (1): 443–93.

Haeckel, M., et al, 2021. Impacts of deep seabed mining – Initial results from the trial of a pre-prototype manganese nodule collector. In 16th Deep Sea Biology Symposium. September 2021. Brest, France.

Halbach, P., Schneider, S., Jahn, A. and Cherkashov, G., 2013. The potential of rare-earth elements in oxidic deep-sea mineral deposits (ferromanganese nodules and crusts). Mineral resources and mine development. Verlag Glückauf GmbH, Essen, pp.161-174.

Halbach, P and H. Abram. 2013. Technical Report Summary. Initial Assessment of the NORI Property, Clarion-Clipperton Zone. Deep Green Metals Inc. In accordance with the requirements of SEC Regulation S-K (subpart 1300). AMC Project 321012. 17 March 2021

Halpern BS, Frazier M, Afflerbach J, Lowndes JS Micheli F, O'Hara C, Scarborough C, Selkoe KA, 2019. Recent pace of change in human impact on the world's ocean. Scientific Reports 9, 11609

Halpern BS, Frazier M, Potapenko J, Casey KS, Koenig K, Longo Cm Lowndes JS, Rockwood RC, Selig ER, Selkoe KA, Walbridge S. 2015. Spatial and temporal changes in cumulative human impacts on the world's ocean. Nat Commun 6, 7615.

Hammond, D.E., McManus, J., Berelson, W.M., Kilgore, T.E. and Pope, R.H. (1996). Early diagenesis of organic material in equatorial Pacific sediments: stoichiometry and kinetics. Deep Sea Research Part II: Topical Studies in Oceanography, 43(4-6), pp.1365-1412.

Hannides CCS, Popp BN, Choy CA, Drazen JC (2013) Midwater zooplankton and suspended particle dynamics in the North Pacific Subtropical Gyre: a stable isotope perspective. Limnol Oceanogr 58:1931-1946

Hannides CCS, Popp BN, Close HG, Benitez-Nelson CR, Ka'apu-Lyons CA, Gloeckler K, Wallsgrove N, Umhau B, Palmer E, Drazen JC (2020) Seasonal dynamics of midwater zooplankton and relation to particle cycling in the North Pacific Subtropical Gyre. Progress in Oceanography 182. doi:10.1016/j.pocean.2020.102266

Hannides CCS, Popp BN, Landry MR, Graham BS (2009) Quantification of zooplankton trophic position in the North Pacific Subtropical Gyre using stable nitrogen isotopes. Limnology and Oceanography 54:50-61. doi:10.4319/lo.2009.54.1.0050

Hannides, C.C.S., Popp, B.N., Choy, C.A., Drazen, J.C., 2013. Mid-water zooplankton and suspended particle dynamics in the North Pacific Subtropical Gyre: a stable isotope perspective. Limnology and Oceanography 58 (6), 1931-1946.

Harbour, R.P., Leitner, A.B., Ruehlemann, C., Vink, A., Sweetman, A.K., 2020. Benthic and Demersal Scavenger Biodiversity in the Eastern End of the Clarion-Clipperton Zone – An Area Marked for Polymetallic Nodule Mining. Front. Mar. Sci. 7, 458. https://doi.org/10.3389/fmars.2020.00458

Hauquier, Freija, Lara Macheriotou, Tania N. Bezerra, Great Egho, Pedro Martínez Arbizu, and Ann Vanreusel. 2019. 'Distribution of Free-Living Marine Nematodes in the Clarion–Clipperton Zone: Implications for Future Deep-Sea Mining Scenarios'. Biogeosciences 16 (18): 3475–89.

Hauton, Chris, Alastair Brown, Sven Thatje, Nélia C. Mestre, Maria J. Bebianno, Inês Martins, Raul Bettencourt, _et al._ 2017. 'Identifying Toxic Impacts of Metals Potentially Released during Deep-Sea Mining—A Synthesis of the Challenges to Quantifying Risk'. Frontiers in Marine Science 4 (November): 368.

Hecker B. and A.Z. Paul, 1977. Benthic baseline survey of the DOMES area. DOMES final report under NOAA contract 03-6-022-35141: 1-115

Hegmann, G., Cocklin, C., Creasey, R., Dupuis, S., Kennedy, A., Kingsley, L., Ross, W., Spaling, H., Stalker, D., 1999. Cumulative effects assessment practitioners guide.

Heller, T. Kuhn, G.J. Versteegh, A.V. Wegorzewski, S. Kasten., 2018. The geochemical behavior of metals during early diagenetic alteration of buried manganese nodules Deep-Sea Res. Part I, 142, pp. 16-33

Hess, S., Kuhnt, W., Hill, S., Kaminski, M. A., Holbourn, A., & de Leon, M. (2001). Monitoring the recolonization of the Mt Pinatubo 1991 ash layer by benthic foraminifera. Marine Micropaleontology, 43(1-2), 119-142.

Hess, S., Kuhnt, W., Hill, S., Kaminski, M.A., Holbourn, A. and de Leon, M., 2001. Monitoring the recolonization of the Mt Pinatubo 1991 ash layer by benthic foraminifera. _Marine Micropaleontology_, _43_(1-2), pp.119-142.

Hessler RR, Jumars PA. Abyssal community analysis from replicate cores in the central North Pacific. Deep Sea Research and Oceanographic 1974 Mar 1 (Vol. 21, No. 3, pp. 185-209). Elsevier.

Hessler, R.R.; Jumars, P.A. Abyssal community analysis from replicate box cores in the central north pacific. Deep Sea Res. 1974, 21, 185–209.

Hestetun, Jon Thomassen, Einar Bye-Ingebrigtsen, R. Henrik Nilsson, Adrian G. Glover, Per-Otto Johansen, and Thomas G. Dahlgren. 2020. 'Significant Taxon Sampling Gaps in DNA Databases Limit the Operational Use of Marine Macrofauna Metabarcoding'. Marine Biodiversity 50 (5): 70.

Higgins, R. P., & Thiel, H. 1988. Introduction to the study of meiofauna. Smithsonian Institution Press.

Horton T, Marsh L, Bett BJ, Gates AR, Jones DOB, Benoist NMA, Pfeifer S, Simon-Lledó E, Durden JM, Vandepitte L and Appeltans W (2021) Recommendations for the Standardisation of Open Taxonomic Nomenclature for Image-Based Identifications. _Front. Mar. Sci._ 8:620702. doi: 10.3389/fmars.2021.620702

Howard, P., Parker, G., Jenner, N., Holland, T., 2020. An assessment of the risks and impacts of seabed mining on marine ecosystems. Flora & Fauna International.

Hu, Vernon J. H. 1981. 'Ingestion of Deep-Sea Mining Discharge by Five Species of Tropical Copepods'. Water, Air, and Soil Pollution 15 (4): 433–40.

Hu, Z.; Hu, H.; Huang, Y. 2018. Association between night-time artificial light pollution and sea turtle nest density along Florida coast: A geospatial study using VIIRS remote sensing data. Environ. Pollut. 2018, 239, 30–42.

Hulton, P.H., Fayton, J.O., Desrochers. J.B. Nelson, K.N. Sparks, L.M., Bartley, B.M., Greene, J.A. and DeAngelis, M.L. 2020. Quantifying Acoustic Impacts on Marine Species: Methods and Analytical Approach for Activities at the MCAS Cherry Point Range Complex. NUWC-NPT Technical Report 12,333. Report prepared for Naval Undersea Warfare Center Division. Newport, R.I., USA. March 2020.

HYCOM, 2021. Technical Description available at https://www.hycom.org/hycom/documentation

IMO. 2014. Guidelines for the reduction of underwater noise from commercial shipping to address adverse impacts on marine life. Report MEPC.1/Circ.833. A WWW publication at http://docs.nrdc.org/water/files/wat_14050501a.pdf.

International Finance Corporation (IFC). 2013. Good Practice Handbook for Cumulative Impact Assessment and Management: Guidance for the Private Sector in Emerging Markets. International Finance Corporation. Washington DC, USA.

International Maritime Organisation (IMO). 2013. Reducing risk of collisions with whales avoiding collisions prevents damage to ships, and injuries to passengers, crew and whales. Leaflet available at https://iwc.int/private/downloads/h1Sgsk87jXrzYkNin5mfuQ/IFAW%20ship%20strike%20English%202013_web.pdf

International Seabed Authority (ISA)., 2010. Technical study 6 A Geological Model Of Polymetallic Nodule Deposits In The Clarion- Clipperton Fracture Zone https://isa.org.jm/files/documents/EN/Pubs/GeoMod-Rep-2010.pdf. Accessed May 2020.

Irigoien, X., Klevjer, T.A., Røstad, A., Martinez, U., Boyra, G., Acuña, J.L., Bode, A., Echevarria, F., Gonzalez-Gordillo, J.I., Hernandez-Leon, S., Agusti, S., Aksnes, D.L., Duarte, C.M., Kaartvedt, S., 2014. Large mesopelagic fishes biomass and trophic efficiency in the open ocean. Nature Communications 5, 3271.

ISA. 2020. Recommendations for the guidance of contractors for the assessment of the possible environmental impacts arising from exploration for marine minerals in the Area. Legal and Technical Commission, International Seabed Authority. Report No. ISBA/25/LTC/6/Rev.1. LTC Session, Part 1: Agenda Session 11, held on 4-15 March 2019 at Kingston, Jamaica. 30 March 2020.

ISBA. 2020. 'Deep CCZ Biodiversity Synthesis Workshop Report - Final-for Posting-Clean-1.Pdf'. https://isa.org.jm/files/files/documents/Deep%20CCZ%20Biodiversity%20Synthesis%20Workshop%20Report%20-%20Final-for%20posting-clean-1.pdf.

iSeaMC. 2020. Characterization of sediment plumes behind mining vehicles in the NORI area (laboratory analyses). Final report prepared by iSeaMC for The Metals Company. October 2020.

ISO/DIS. 2016. 8405.2. Underwater acoustics—terminology.

Jahnke, R., Heggie, D., Emerson, S., Grundmanis, V., 1982. Pore waters of the central PacificOcean: nutrient results. Earth and Planetary Science Letters, 61, p.233-256

Jang, M. H., Kim, W. K., Lee, S. K., Henry, T. B., & Park, J. W. 2014. Uptake, tissue distribution, and depuration of total silver in common carp (Cyprinus carpio) after aqueous exposure to silver nanoparticles. Environmental science & technology, 48(19), 11568-11574.

Jarman CL, Larsen T, Hunt T, Lipo C, Solsvik R, Wallsgrove N, Ka'apu-Lyons C, Close HG, Popp BN (2017) Diet of the prehistoric population of Rapa Nui (Easter Island, Chile) shows environmental adaptation and resilience. American Journal of Physical Anthropology 164:343-361. doi:10.1002/ajpa.23273

Jarman CL, Larsen T, Hunt T, Lipo C, Solsvik R, Wallsgrove N, Ka'apu-Lyons C, Close HG, Popp BN (2017) Diet of the prehistoric population of Rapa Nui (Easter Island, Chile) shows environmental adaptation and resilience. American Journal of Physical Anthropology 164:343-361. doi:10.1002/ajpa.23273

Jiao N, Robinson C, Azam F, Thomas H, Baltar F, Dang H, Hardman-Mountford NJ, Johnson M, Kirchman DLm Koch BP, Legendre L, Li C, Liu J, Luo T, Luo Y-W, Mitra A, Romanou A, Tang K, Wang K, Zhang C, Zhang R. 2014. Mechanisms of microbial carbon sequestration in the ocean – future research directions. Biogeosciences, 11, 5285–5306.

Jiao, N., Herndl, G. J., Hansell, D. A., Benner, R., Kattner, G., Wilhelm, S. W., _et al._ 2010. Microbial production of recalcitrant dissolved organic matter: long-term carbon storage in the global ocean. Nature Reviews Microbiology. 8(8):593-9.

Jones, D.O., Kaiser, S., Sweetman, A.K., Smith, C.R., Menot, L., Vink, A., Trueblood, D., Greinert, J., Billett, D.S., Arbizu, P.M. and Radziejewska, T. (2017). Biological responses to disturbance from simulated deep-sea polymetallic nodule mining. PLoS One, 12(2), p.e0171750.

Jones, D.O., Yool, A., Wei, C.L., Henson, S.A., Ruhl, H.A., Watson, R.A. and Gehlen, M., 2014. Global reductions in seafloor biomass in response to climate change. _Global change biology_, _20_(6), pp.1861-1872.

Jones, D.O.B., Ardron, J.A., Colaço, A., Durden, J.M., 2020. Environmental considerations for impact and preservation reference zones for deep-sea polymetallic nodule mining. Marine Policy 118, S0308597X18301374. https://doi.org/10.1016/j.marpol.2018.10.025

Jones, D.O.B., Kaiser, S., Sweetman, A.K., Smith, C.R., Menot, L., Vink, A., Trueblood, D., Greinert, J., Billett, D.S.M., Arbizu, P.M., Radziejewska, T., Singh, R., Ingole, B., Stratmann, T., Simon-Lledo, E., Durden, J.M., Clark, M.R., 2017. Biological responses to disturbance from simulated deep-sea polymetallic nodule mining. PLoS ONE 12. https://doi.org/10.1371/journal.pone.0171750

Jones, D.O.B., Simon-Lledó, E., Amon, D.J., Bett, B.J., Caulle, C., Clément, L., Connelly, D.P., Dahlgren, T.G., Durden, J.M., Drazen, J.C., Felden, J., Gates, A.R., Georgieva, M.N., Glover, A.G., Gooday, A.J., Hollingsworth, A.L., Horton, T., James, R.H., Jeffreys, R.M., Laguionie-Marchais, C., Leitner, A.B., Lichtschlag, A., Menendez, A., Paterson, G.L.J., Peel, K., Robert, K., Schoening, T., Shulga, N.A., Smith, C.R., Taboada, S., Thurnherr, A.M., Wiklund, H., Young, C.R., Huvenne, V.A.I., 2021. Environment, ecology, and potential effectiveness of an area protected from deep-sea mining (Clarion Clipperton Zone, abyssal Pacific). Progress in Oceanography 197, 102653. https://doi.org/10.1016/j.pocean.2021.102653

Jönsson BF, Watson JR. 2016. The timescales of global surface-ocean connectivity. Nature communications 7, 11239.

Jorissen, F., Nardelli, M. P., Almogi-Labin, A., Barras, C., Bergamin, L., Bicchi, E., ... & Spezzaferri, S. 2018. Developing Foram-AMBI for biomonitoring in the Mediterranean: species assignments to ecological categories. Marine Micropaleontology, 140, 33-45.

Jouffray, J.-B., R. Blasiak, A.V. Norström H. österblom and Magnus Nyströmand. 2016. The Blue Acceleration: The Trajectory of Human Expansion into the Ocean. Stockholm Resilience Centre, Stockholm University, Stockholm, Sweden. One Earth 2, January 24, 2020.

JPI Oceans. 2022. Stakeholder Event 1-2 February 2022. https://miningimpact.geomar.de/events

Kaifu, K., Segawa, S. and Tsuchiya, K. 2007. Behavioral responses to underwater sound in the small benthic octopus, Octopus ocellatus. Journal of the Marine Acoustics Society of Japan, 34, 266-273.

Kamenskaya, O. E., V. F. Melnik, and A. J. Gooday. 2013. 'Giant Protists (Xenophyophores and Komokiaceans) from the Clarion-Clipperton Ferromanganese Nodule Field (Eastern Pacific)'. Biology Bulletin Reviews 3 (5): 388–98.

Kamenskaya, O.E., Gooday, A.J., Radziejewska, T., Wawrzyniak-Wydrowska, B. (2012). Large, enigmatic foraminiferan-like protists in the eastern part of the Clarion- Clipperton Fracture Zone (abyssal eastern equatorial Pacific): biodiversity and ver- tical distribution in the sediment. Mar. Biodivers. 42, 311–327. https://doi.org/10. 1007/s12526-012-0114-7.

Karl, D. M., Letelier, R. M., Bidigare, R. R., Björkman, K. M., Church, M. J., Dore, J. E., & White, A. E. 2021. Seasonal-to-decadal scale variability in primary production and particulate matter export at Station ALOHA. Progress in Oceanography, 195, 102563.

Karstensen, J., L. Stramma, and M. Visbeck. 2008. Oxygen minimum zones in the eastern tropical Atlantic and Pacific oceans. Progress in Oceanography 77: 331-350

Kaufman, L. and Rousseeuw, P. 1990. Finding Groups in Data: An Introduction to Cluster Analysis. John Wiley and Sons.

Kersten, O., Smith C R, Vetter E. 2017. Abyssal near-bottom dispersal stages of benthic invertebrates in the Clarion-Clipperton polymetallic nodule province. Deep Sea Research Part I Oceanographic Research Papers 127..

Kersten, Oliver, Eric W. Vetter, Michelle J. Jungbluth, Craig R. Smith, and Erica Goetze. 2019. 'Larval Assemblages over the Abyssal Plain in the Pacific Are Highly Diverse and Spatially Patchy'. PeerJ 7 (September): e7691.

Khripounoff, A., Caprais, J.C., Crassous, P. and Etoubleau, J., 2006. Geochemical and biological recovery of the disturbed seafloor in polymetallic nodule fields of the Clipperton-Clarion Fracture Zone (CCFZ) at 5,000-m depth. _Limnology and Oceanography_, _51_(5), pp.2033-2041.

Klevjer, T.A., Irigoien, X., Røstad, A., Fraile-Nuez, E., Benítez-Barrios, V.M. and Kaartvedt, S., 2016. Large scale patterns in vertical distribution and behaviour of mesopelagic scattering layers. Scientific Reports, 6(1), pp.1-11.

Knauer GA, Martin JH, Bruland KW (1979) Fluxes of particulate carbon, nitrogen, and phosphorus in the upper water column of the northeast Pacific. Deep Sea Research Part A Oceanographic Research Papers 26:97-108. doi:https://doi.org/10.1016/0198-0149(79)90089-X

Kochener, R., 1998. Effects of artificial light on deep sea organism. Recommendations for ongoing use of artificial light on deep sea submersibles. Technical Report for the Monterrey Bay National Marine Sanctuary Research.

Koschinsky, A. 2001. Heavy metal distributions in Peru Basin surface sediments in relation to historic, present and disturbed redox environments. Deep Sea Research Part II: Topical Studies in Oceanography,

48(17-18), 3757-3777.Koschinsky, A., Borowski, C. and Halbach, P., 2003. Reactions of the heavy metal cycle to industrial activities in the deep-sea: An ecological assessment. International Review of Hydrobiology: A Journal Covering all Aspects of Limnology and Marine Biology, 88(1), pp.102-127.

Koschinsky, A., Gaye-Haake, B., Arndt, C., Maue, G., Spitzy, A., Winkler, A. and Halbach, P., 2001. Experiments on the influence of sediment disturbances on the biogeochemistry of the deep-sea environment. _Deep Sea Research Part II: Topical Studies in Oceanography_, _48_(17-18), pp.3629-3651.

Kozich, J. J., Westcott, S. L., Baxter, N. T., Highlander, S. K., & Schloss, P. D. 2013. Development of a dual-index sequencing strategy and curation pipeline for analyzing amplicon sequence data on the MiSeq Illumina sequencing platform. Applied and environmental microbiology, 79(17), 5112-5120.Kuhn, T. & Rühlemann, C. 2021. Exploration of Polymetallic Nodules and Resource Assessment: A Case Study from the German Contract Area in the Clarion-Clipperton Zone of the Tropical Northeast Pacific. Minerals. 11(6):618.

Lam PJ, Ohnemus DC, Auro ME (2015) Size-fractionated major particle composition and concentrations from the US GEOTRACES North Atlantic Zonal Transect. Deep Sea Research Part II: Topical Studies in Oceanography 116:303-320. doi:https://doi.org/10.1016/j.dsr2.2014.11.020

Landry, Michael R., Hussain Al-Mutairi, Karen E. Selph, Stephanie Christensen, and Scott Nunnery. 2001. 'Seasonal Patterns of Mesozooplankton Abundance and Biomass at Station ALOHA'. Deep-sea Research Part II: Topical Studies in Oceanography 48 (8): 2037–61.

Langenkämper, D., Zurowietz, M., Schoening, T., & Nattkemper, T. W. 2017. Biigle 2.0-browsing and annotating large marine image collections. Frontiers in Marine Science, 4, 83.

Laroche, O., O. Kersten, C. R. Smith, and E. Goetze. 2020a. Environmental DNA surveys detect distinct metazoan communities across abyssal plains and seamounts in the western Clarion Clipperton Zone. Molecular Ecology 29:4588-4604.

Laroche, O., O. Kersten, C. R. Smith, and E. Goetze. 2020b. From sea surface to seafloor: a benthic allochthonous eDNA survey for the abyssal ocean. Pages 1-16 Frontiers in Marine Science.

Laroche, O., Wood, S.A., Tremblay, L.A., Lear, G., Ellis, J.I. and Pochon, X., 2017. Metabarcoding monitoring analysis: the pros and cons of using co-extracted environmental DNA and RNA data to assess offshore oil production impacts on benthic communities. _PeerJ_, _5_, p.e3347.

Lavelle, J. W., Ozturgut, E., Baker, E. T., & Swift, S. A. 1982. Discharge and surface plume measurements during manganese nodule mining tests in the North Equatorial Pacific. Marine Environmental Research, 7(1), 51-70.

Lei, Yan Li, Tie Gang Li, Hongsheng Bi, Wen Lin Cui, Wen Peng Song, Ji Ye Li, and Cheng Chun Li. 2015. 'Responses of Benthic Foraminifera to the 2011 Oil Spill in the Bohai Sea, PR China'. Marine Pollution Bulletin 96 (1–2): 245–60.

Leitner, A.B., Durden, J.M., Smith, C.R., Klingberg, E.D., Drazen, J.C., 2020. Synaphobranchid eel swarms on abyssal seamounts: Largest aggregation of fishes ever observed at abyssal depths. Deep Sea Research Part I: Oceanographic Research Papers 103423. https://doi.org/10.1016/j.dsr.2020.103423

Leitner, A.B., Neuheimer, A.B., Donlon, E., Smith, C.R. and Drazen, J.C., 2017. Environmental and bathymetric influences on abyssal bait-attending communities of the Clarion Clipperton Zone. Deep-sea Research Part I: Oceanographic Research Papers, 125, pp.65-80.

Lemaire, B. (2017). Hydrostatic pressure and the experimental toxicology of marine fishes: The elephant in the room. Marine Pollution Bulletin, 124(1), Elsevier., pp.206–210. [Online]. Available at: doi:10.1016/j.marpolbul.2017.07.025.

Levin, L.A. 2003. Oxygen minimum zone benthos: Adaptation and community response to hypoxia. Oceanography and Marine Biology: An Annual Review. 41. 1-45.

Levin, L.A., 2018. Manifestation, Drivers, and Emergence of Open Ocean Deoxygenation. Annual Review of Marine Science 10, 229–260. https://doi.org/10.1146/annurev-marine-121916-063359

Levin, L.A., Wei, C.-L., Dunn, D.C., Amon, D.J., Ashford, O.S., Cheung, W.W.L., Colaço, A., Dominguez-Carrió, C., Escobar, E.G., Harden-Davies, H.R., Drazen, J.C., Ismail, K., Jones, D.O.B., Johnson, D.E., Le, J.T., Lejzerowicz, F., Mitarai, S., Morato, T., Mulsow, S., Snelgrove, P.V.R., Sweetman, A.K., Yasuhara, M., 2020. Climate change considerations are fundamental to management of deep-sea resource extraction. Global Change Biology 26, 4664–4678. https://doi.org/10.1111/gcb.15223.

Lewis, E. & Wallace, D. W. R.1998. Program Developed for CO2 System Calculations. ORNL/CDIAC-105. Carbon Dioxide Information Analysis Center, Oak Ridge National Laboratory, U.S. Department of Energy, Oak Ridge, Tennessee.

Lin, Tzu-Hao, Chong Chen, Hiromi Kayama Watanabe, Shinsuke Kawagucci, Hiroyuki Yamamoto, and Tomonari Akamatsu. 2019. 'Using Soundscapes to Assess Deep-Sea Benthic Ecosystems'. Trends in Ecology & Evolution 34 (12): 1066–69.

Lindh, Markus V., Brianne M. Maillot, Christine N. Shulse, Andrew J. Gooday, Diva J. Amon, Craig R. Smith, and Matthew J. Church. 2017. 'From the Surface to the Deep-Sea: Bacterial Distributions across Polymetallic Nodule Fields in the Clarion-Clipperton Zone of the Pacific Ocean'. Frontiers in Microbiology 8 (September): 1696.

Lindh, Markus V., Brianne M. Maillot, Craig R. Smith, and Matthew J. Church. 2018. 'Habitat Filtering of Bacterioplankton Communities above Polymetallic Nodule Fields and Sediments in the Clarion-Clipperton Zone of the Pacific Ocean: Metacommunity Structure of Clarion-Clipperton Zone Bacteria'. Environmental Microbiology Reports 10 (2): 113–22.

Lins, L., Guilini, K., Veit-Köhler, G., Hauquier, F., Alves, R. M. d. S., Esteves, A. M., and Vanreusel, A. (2014). The link between meio fauna and surface productivity in the Southern Ocean, Deep-Sea Res. Pt. II, 108, 60–68, 2014.

Lovell, J.M., Findlay, M.M., Moate, R.M. and Yan, H.Y. 2005. The hearing abilities of the prawn Palaemon serratus. Comparative Biochemistry and Physiology: Part A: Molecular and Integrative Physiology, 140: 89-100.

Lupton, J. (1998). Hydrothermal helium plumes in the Pacific Ocean. Journal of Geophysical Research, 103(C8), 15853-15868. http://dx.doi.org/10.1029/98JC00146

Lutz, M.J., Caldeira, K., Dunbar, R.B. and Behrenfeld, M.J. (2007). Seasonal rhythms of net primary production and particulate organic carbon flux to depth describe the efficiency of biological pump in the global ocean. Journal of Geophysical Research: Oceans, 112(C10).

Maas, A.E., Frazar, S.L., Outram, D.M., Seibel, B.A., Wishner, K.F., 2014. Fine-scale vertical distribution of macroplankton and micronekton in the Eastern Tropical North Pacific in association with an oxygen minimum zone. Journal of plankton research 36, 1557–1575.

Macheriotou, L., Rigaux, A., Derycke, S., Vanreusel, A., 2020. Phylogenetic clustering and rarity imply risk of local species extinction in prospective deep-sea mining areas of the Clarion-Clipperton Fracture Zone. Proceedings of the Royal Society B: Biological Sciences 287, 20192666.

Margin. 2020. NORI D Geological Model Phase 1 Report. Report to The Metals Company Metals Inc by Margin – Marine Geoscience Innovation.

Marnane M., Elsdon T., Rouphael T, Pedersen C., Peat K. and Morgan C. 2019, Enhancing environmental performance during Wheatstone dredging through science and innovation. Journal of the Australian Petroleum Production & Exploration Association (APPEA) 57(2), 2017.

Marsh, L., Huvenne, V.A. and Jones, D.O., 2018. Geomorphological evidence of large vertebrates interacting with the seafloor at abyssal depths in a region designated for deep-sea mining. Royal Society open science, 5(8), p.180286.

Matsumoto, K., 2007. Radiocarbon-based circulation age of the world oceans. _Journal of Geophysical Research: Oceans_, _112_(C9).

Maynard, Sherwood D, Fletcher V Riggs, and John F Walters'. 1975. 'Mesopelagic micronekton in hawaiian waters: faunal composition, standing stock, and diel vertical migration', 11.

Mayor, D. J, Thornton, B, Hay, S., Zuur, A. F, Nicol, G. W, McWilliam, J. M, & Witte, U. F. (2012). Resource quality affects carbon cycling in deep-sea sediments. The ISME journal. 6(9):1740–1748. https://doi.org/10.1038/ismej.2012.14

McCauley, R.D., Fewtrell, J., Duncan, A.J., Jenner, C., Jenner, M.N., Penrose, J.D., Prince, R.I.T., Adhitya, A., Murdoch, J. and McCabe, K. 2000. Marine seismic surveys – a study of environmental implications. Journal of Australian Petroleum Production and Exploration Association, 40: 692–708.

McClain, C. R. 2007. Seamounts: identity crisis or split personality? Journal of Biogeography 34, 2001–2008.

McKenna, M.F., Ross, D., Wiggins, S.M. and Hildebrand, J.A., 2012. Underwater radiated noise from modern commercial ships. The Journal of the Acoustical Society of America, 131(1), pp.92-103.

McQuaid, K.A., Attrill, M.J., Clark, M.R., Cobley, A., Glover, A.G., Smith, C.R., Howell, K.L., 2020. Using Habitat Classification to Assess Representativity of a Protected Area Network in a Large, Data-Poor Area Targeted for Deep-Sea Mining. Front. Mar. Sci. 7, 558860. https://doi.org/10.3389/fmars.2020.558860

Measures, C.I., W.M. Landing, M.T. Brown, and C.S Buck. 2008. A commercially available rosette system for trace metal clean sampling. Limnology and Oceanography Methods, 6: 384-394.

Measures, C. I., Landing, W. M., Brown, M. T., & Buck, C. S. 2008b. High-resolution Al and Fe data from the Atlantic Ocean CLIVAR-CO2 Repeat Hydrography A16N transect: Extensive linkages between atmospheric dust and upper ocean geochemistry. Global Biogeochem. Cycles, 22, GB1005.

Merkel, F.R.; Johansen, K.L. Light-induced bird strikes on vessels in Southwest Greenland. Mar. Pollut. Bull. 2011, 62, 2330–2336.

Mestre, N.C., Auguste, M., De Sá, L.C., Fonseca, T.G., Cardoso, C., Brown, A., Barthelemy, D., Charlemagne, N., Hauton, C., Machon, J. and Ravaux, J. (2019a). Are shallow-water shrimps proxies for hydrothermal-vent shrimps to assess the impact of deep-sea mining? Marine Environmental Research, 151, p.104771. [Online]. Available at: doi:10.1016/j.marenvres.2019.104771.

Mestre, N.C., Calado, R. and Soares, A.M.V.M. (2014). Exploitation of deep-sea resources: The urgent need to understand the role of high pressure in the toxicity of chemical pollutants to deep-sea organisms. Environmental Pollution, 185, Elsevier Ltd., pp.369–371. [Online]. Available at: doi:10.1016/j.envpol.2013.10.021.

Mestre, Nélia C., Thiago L. Rocha, Miquel Canals, Cátia Cardoso, Roberto Danovaro, Antonio Dell'Anno, Cristina Gambi, Francesco Regoli, Anna Sanchez-Vidal, and Maria João Bebianno. 2017. 'Environmental Hazard Assessment of a Marine Mine Tailings Deposit Site and Potential Implications for Deep-Sea Mining'. Environmental Pollution (Barking, Essex: 1987) 228 (September): 169–78.

Mevenkamp, L., Guilini, K., Boetius, A., Grave, J.D., Laforce, B., Vandenberghe, D., Vincze, L. and Vanreusel, A. (2019). Responses of an abyssal meiobenthic community to short-term burial with crushed nodule particles in the south-east Pacific. Biogeosciences, 16(11), pp.2329-2341.

Mevenkamp, Lisa, Tanja Stratmann, Katja Guilini, Leon Moodley, Dick van Oevelen, Ann Vanreusel, Stig Westerlund, and Andrew K. Sweetman. 2017. 'Impaired Short-Term Functioning of a Benthic Community from a Deep Norwegian Fjord Following Deposition of Mine Tailings and Sediments'. Frontiers in Marine Science 4 (May): 169.

Mewes _et al._, 2016 K. Mewes, J.M. Mogollón, A. Picard, C. Rühlemann, A. Eisenhauer, T. Kuhn, W. Ziebis, S. Kasten Diffusive transfer of oxygen from seamount basaltic crust into overlying sediments: an example from the Clarion-Clipperton Fracture Zone Earth Planet. Sci. Lett., 433 (2016), pp. 215-225, 10.1016/j.epsl.2015.10.028

Mewes, K., Mogollón, J. M., Picard, A., Rühlemann, C., Kuhn, T., Nöthen, K., & Kasten, S. 2014. Impact of depositional and biogeochemical processes on small scale variations in nodule abundance in the Clarion-Clipperton Fracture Zone. Deep-sea Research Part I: Oceanographic Research Papers, 91, 125-141.

MIDAS, 2016a. (Managing Impacts of DeepSea Resource Exploitation) https://www.eu-midas.net/science/nodules.

Middelburg, J.J. and Nieuwenhuize, J., 2000. Nitrogen uptake by heterotrophic bacteria and phytoplankton in the nitrate-rich Thames estuary. _Marine Ecology Progress Series_, _203_, pp.13-21.

Miljutina, M.A., Miljutina, D.M., Mahatma, R. and Galéron, J., 2010. Deep-sea nematode assemblages of the Clarion-Clipperton Nodule Province (Tropical North-Eastern Pacific). Marine Biodiversity, 40(1), pp.1-15.

Miller, K.A., Brigden, K., Santillo, D., Currie, D., Johnston, P. and Thompson, K.F. (2021). Challenging the Need for Deep Seabed Mining From the Perspective of Metal Demand, Biodiversity, Ecosystems Services, and Benefit Sharing. Frontiers in Marine Science, p.1040.

Miller, K.A., Thompson, K.F., Johnston, P., Santillo, D., 2018. An overview of seabed mining including the current state of development, environmental impacts, and knowledge gaps. Frontiers in Marine Science 4. https://doi.org/10.3389/fmars.2017.00418

Milligan, R. J., K. J. Morris, B. J. Bett, J. M. Durden, D. O. B. Jones, K. Robert, H. A. Ruhl, and D. M. Bailey. 2016. 'High Resolution Study of the Spatial Distributions of Abyssal Fishes by Autonomous Underwater Vehicle'. Scientific Reports 6 (1): 26095.

Moein-Bartol, S.E., Musick, J.A., Keinath, J.A., Barnard, D.E. Lenhardt, M.L. and George, R. 1995. Evaluation of seismic sources for repelling sea turtles from hopper dredges. In: Sea turtle research program: Summary Report. Technical Report No. CERC-95. US Army Engineer Division, Atlanta, GA.

Moens, T., Braeckman, U., Derycke, S., Fonseca, G., Gallucci, F., Gingold, R., Guilini, K., Ingels, J., Leduc, D., Vanaver beke, J., Van Colen, C., Vanreusel, A., and Vincx, M. (2013): Ecology of free-living marine nematodes, in: Handbook of Zool ogy: Gastrotricha, Cycloneuralia and Gnathifera, Vol. 2: Nematoda, edited by: Schmidt-Rhaesa, A., Walter de Gruyter GmbH, Berlin/Boston, 109–152.

Mojtahid, M., F. Jorissen, J. Durrieu, F. Galgani, H. Howa, F. Redois, and R. Camps. 2006. 'Benthic Foraminifera as Bio-Indicators of Drill Cutting Disposal in Tropical East Atlantic Outer Shelf Environments'. Marine Micropaleontology 61 (1–3): 58–75.

Molari, M., Manini, E. and Dell'Anno, A., 2013. Dark inorganic carbon fixation sustains the functioning of benthic deep-sea ecosystems. _Global Biogeochemical Cycles_, _27_(1), pp.212-221.

Monterey Bay Aquarium Research Institute (MBARI) Periodic Table of Elements in the Ocean. 2021. https://www.mbari.org/science/upper-ocean-systems/chemical-sensor-group/periodic-table-of-elements-in-the-ocean/

Morgan, C.L., 1999. 6 Resource Estimates of the. _Handbook of Marine Mineral Deposits_, _18_, p.145.

Morvan, Julie, Valérie Le Cadre, Frans Jorissen, and Jean-Pierre Debenay. 2004. 'Foraminifera as Potential Bio-Indicators of the "Erika" Oil Spill in the Bay of Bourgneuf: Field and Experimental Studies'. Aquatic Living Resources 17 (3): 317–22.

Muñoz-Royo, C., Peacock, T., Alford, M.H., Smith, J.A., Le Boyer, A., Kulkarni, C.S., Lermusiaux, P.F.J., Haley, P.J., Mirabito, C., Wang, D., Adams, E.E., Ouillon, R., Breugem, A., Decrop, B., Lanckriet, T., Supekar, R.B., Rzeznik, A.J., Gartman, A., Ju, S.-J., 2021. Extent of impact of deep-sea nodule mining midwater plumes is influenced by sediment loading, turbulence and thresholds. Commun Earth Environ 2, 148.

Munson, K. M., Lamborg, C. H., Swarr, G. J., & Saito, M. A. (2015). Mercury species concentrations and fluxes in the Central Tropical Pacific Ocean. Global Biogeochemical Cycles, 29(5), 656-676. https://agupubs.onlinelibrary.wiley.com/doi/abs/10.1002/2015GB005120

Nameroff, T.J., Balistrieri, L.S. and Murray, J.W., 2002. Suboxic trace metal geochemistry in the eastern tropical North Pacific. Geochimica et Cosmochimica Acta, 66(7), pp.1139-1158.

Netburn AN, Koslow AJ (2015) Dissolved oxygen as a constraint on daytime deep scattering layer depth in the southern California current ecosystem. Deep-Sea Res I 104:149-158. doi:http://dx.doi.org/10.1016/j.dsr.2015.06.006

Netburn, Amanda. 2018. 'From Surface to Seafloor: Exploration of the Water Column (Workshop Report), Honolulu, HI, 4-5 March 2017'. United States. National Oceanic and Atmospheric Administration. Office of Ocean Exploration and Research.

NMFS. 2013. Draft Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammals-Acoustic Threshold Levels for Onset of Permanent and Temporary Threshold Shifts. National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA). December 2013.

NMFS. 2014. Marine Mammals: Interim Sound Threshold Guidance. National Marine Fisheries Service, National Oceanic and Atmospheric Administration, U.S. Department of Commerce.

NMFS. 2018. 2018 Revision to: Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (Version 2.0). Underwater Thresholds for Onset of Permanent and Temporary Threshold Shifts. NOAA Technical Memorandum NMFS-OPR- 59. National Marine Fisheries Service. National Oceanic and Atmospheric Administration. US Department of Commerce. April 2018.

NOAA. 2016. Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing. Underwater Acoustic Thresholds for Onset of Permanent and Temporary Threshold Shifts. National Oceanic and Atmospheric Administration. NOAA Technical Memorandum NMFS-OPR-55. US Department of Commerce.

NOC. 2022. Quantitative benthic megafauna baseline ecological characterisation at NORI-D: Year 1 summary report to TMC. October 2021. National Oceanographic Centre.

Nomaki, H., Rastelli, E., Alves, A., Suga, H., Ramos, S., Kitahashi, T., Tsuchiya, M., Ogawa, N.O., Matsui, Y., Seike, K., Miyamoto, N., Corinaldesi, C., Manea, E., Ohkouchi, N., Danovaro, R., Nunoura, T., Amaro, T., 2021. Abyssal fauna, benthic microbes, and organic matter quality across a range of trophic conditions in the western Pacific ocean. Progress in Oceanography 195, 102591. https://doi.org/10.1016/j.pocean.2021.102591

NORI, 2019. Preliminary Economic Assessment of the NORI Area D Project, Clarion Clipperton Zone. The Metals Company Metals Inc. AMC Project 319002. 17 May 2019.

Nozawa, F., Kitazato, H., Tsuchiya, M., Gooday, A.J. (2006). 'Live' benthic foraminifera at an abyssal site in the equatorial Pacific nodule province: abundance, diversity and taxonomic composition. Deep-Sea Res. I 53, 1406–1422.

NSR. 2001. Draft Integrated Impact Assessment Statement. Prepared by NSR Environmental Consultants Pty Ltd for Basslink Pty Ltd.

O'Malley, Bryan J., Patrick T. Schwing, Michael Martínez-Colón, Silvia Spezzaferri, Maria L. Machain-Castillo, Rebekka A. Larson, Gregg R. Brooks, Ana Carolina Ruiz-Fernández, and David J. Hollander. 2021. 'Development of a Benthic Foraminifera Based Marine Biotic Index (Foram-AMBI) for the Gulf of Mexico: A Decision Support Tool'. Ecological Indicators 120 (January): 106916.

Oebius, H. U., Becker, H. J., Rolinski, S., and Jankowski, J. A. 2001. Parametrization and evaluation of marine environmental impacts produced by deep-sea manganese nodule mining. Deep-sea Res. Part II 48, 3453–3467.

Ohkouchi N, Chikaraishi Y, Close HG, Fry B, Larsen T, Madigan DJ, McCarthy MD, McMahon KW, Nagata T, Naito YI, Ogawa NO, Popp BN, Steffan S, Takano Y, Tayasu I, Wyatt ASJ, Yamaguchi YT, Yokoyama Y (2017) Advances in the application of amino acid nitrogen isotopic analysis in ecological and biogeochemical studies. Org Geochem 113:150-174. doi:http://dx.doi.org/10.1016/j.orggeochem.2017.07.009

Orcutt, B.N., Bradley, J. A., Brazelton, W. J., Estes, E. R., Goordial, J. M., Huber, J. A., Jones, R. M., Mahmoudi, N., Marlow, J. J., Murdock, S., & Pachiadaki, M. 2020. Impacts of deep-sea mining on microbial ecosystem services. Limnology and Oceanography 65(7): 1489-1510.

OSPAR. 2009. Assessment of the environmental impact of underwater noise. https://www.ospar.org/work-areas/eiha/noise.

OSPAR. 2009. Assessment of the environmental impacts of cables. Publication Number: 437/2009, 19.

Ozdemir, M.S., Saaty, T.L., 2006. The unknown in decision making: what to do about it. Eur. J. Oper. Res. 174 (1), 349–359.

P. Halbach, G. Friedrich, U. von Stackelberg (Eds.), The Manganese Nodule Belt of the Pacific Ocean, Enke, Stuttgart (1988).

Pape, E., Bezerra, T.N., Gheerardyn, H., Buydens, M., Kieswetter, A., Vanreusel, A., 2021. Potential impacts of polymetallic nodule removal on deep-sea meiofauna. Scientific Reports 11, 19996.

Pape, Ellen, Tania N. Bezerra, Freija Hauquier, and Ann Vanreusel. 2017. 'Limited Spatial and Temporal Variability in Meiofauna and Nematode Communities at Distant but Environmentally Similar Sites in an Area of Interest for Deep-Sea Mining'. Frontiers in Marine Science 4 (June): 205.

Parada, A.E., Needham, D.M. and Fuhrman, J.A., 2016. Every base matters: assessing small subunit rRNA primers for marine microbiomes with mock communities, time series and global field samples. Environmental microbiology, 18(5), pp.1403-1414.

Parnum, Iain. 2020. Bioacoustic Analysis of Underwater Sound Recordings Collected in the NORI-D: Preliminary Analysis and Workflow Development (Milestone 1).

Paul, S. A. L., Zitoun, R., Noowong, A., Manirajah, M., & Koschinsky, A. 2021. Copper-binding ligands in deep-sea pore waters of the Pacific Ocean and potential impacts of polymetallic nodule mining on the copper cycle. Scientific Reports, 11, 18425.

Paul, S.A.L. (2019). Biogeochemistry of Pacific deep-sea sediments and potential impacts of deep-sea polymetallic nodule mining. Jacobs University Bremen.

Paulikas, D., Katona, S., Ilves, E., & Ali, S. 2022. Deep-sea nodules vs. land ores: a comparative systems analysis of mining and processing wastes for battery-metal supply chains. Journal of Industrial Ecology.

Paulikas, D., Katona, S., Ilves, E., Stone, G., & O'Sullivan, A. 2020. Where should metals for the green transition come from? Comparing environmental, social, and economic impacts of supplying base metals from land ores and seafloor polymetallic nodules. White Paper. April 2020.

Penna, A. Della, Llort, J., Moreau, S., and Patel, R. (2021). The impact of a Southern Ocean cyclonic eddy on mesopelagic micronekton.

Perelman, J. N., Firing, E., van der Grient, J., Jones, B. A., and Drazen, J. C. (2021). Mesopelagic scattering layer behaviors across the Clarion-Clipperton Zone: Implications for deep-sea mining. Front. Mar. Sci. 8, 492.

PIANC. 2010. Dredging and Port Construction Around Coral Reefs. PIANC EnviCom WG108-2010.

Pinheiro, M., Caetano, M., Neuparth, T., Barros, S., Soares, J., Raimundo, J., Vale, C., Coimbra, J., Castro, L.F.C. and Santos, M.M. (2019). Ecotoxicology of deep-sea environments: Functional and biochemical effects of suspended sediments in the model species Mytilus galloprovincialis under hyperbaric conditions. Science of the Total Environment, 670, Elsevier B.V., pp.218–225. [Online]. Available at: doi:10.1016/j.scitotenv.2019.03.196.

Pinheiro, M., Oliveira, A., Barros, S., Alves, N., Raimundo, J., Caetano, M., Coimbra, J., Neuparth, T. and Santos, M.M. (2021). Functional, biochemical and molecular impact of sediment plumes from deep-sea mining on Mytilus galloprovincialis under hyperbaric conditions. Environmental Research, 195, Academic Press Inc., p.110753. [Online]. Available at: doi:10.1016/j.envres.2021.110753.

Pirotta, Enrico, Rachael Milor, Nicola Quick, David Moretti, Nancy Di Marzio, Peter Tyack, Ian Boyd, and Gordon Hastie. 2012. 'Vessel Noise Affects Beaked Whale Behavior: Results of a Dedicated Acoustic Response Study'. PLOS ONE 7 (8): e42535.

Popp, B.N., Graham, B.S., Olson, R.J., Hannides, C.C.S., Lott, M.J., López-Ibarra, G.A., Galván-Magaña, F., Fry, B., 2007. Insight into the trophic ecology of yellowfin tuna, Thunnus albacares, from compound-specific nitrogen isotope analysis of proteinaceous amino acids. Stable Isotopes as Indicators of Ecological Change. Elseiver/Academic Press.

Popper, A.N., Hawkins, A.D., Fay, R.R., Mann, D.A., Bartol, S., Carlson, T.J, Coombs, S., Ellison, W.T., Gentry, R.L., Halvorsen, M.B, Løkkeborg, S., Rogers., P.H, Southall, B.L., Zeddies, D.G. and Tavolga, W.N. 2014. Sound exposure guidelines for Fishes and Sea Turtles. Springer Briefs in Oceanography. DOI 10. 1007/978-3-319-06659-2.

Popper, Arthur N., Jane Fewtrell, Michael E. Smith, and Robert D. McCauley. 2003. 'Anthropogenic Sound: Effects on the Behavior and Physiology of Fishes'. Marine Technology Society Journal 37 (4): 35–40.

Post DM (2002) Using stable isotopes to estimate trophic position: models, methods, and assumptions. Ecology 83:703-718

Proud, R., Cox, M. J., and Brierley, A. S. (2017). Biogeography of the global ocean's mesopelagic zone. Curr. Biol. 27, 113–119.

Purkiani K, Paul A, Vink A, Walter M, Schulz M, Haeckel M. 2020. Evidence of eddy-related deep ocean current variability in the North-East Tropical Pacific Ocean induced by remote gap winds.

R Core Team (2020). R: A language and environment for statistical computing. Available at: https://www.r-project.org/.

Radziejewska, T., 2014. Meiobenthos in the sub-equatorial Pacific Abyss: a proxy in anthropogenic impact evaluation. Springer.

Ramirez-Llodra, E., Reid, W. D. K., & Billett, D. S. M. 2005. Long-term changes in reproductive patterns of the holothurian Oneirophanta mutabilis from the Porcupine Abyssal Plain. Marine Biology, 146(4) 683-693

Ramirez-Llodra, E., Tyler, P.A., Baker, M.C., Bergstad, O.A., Clark, M.R., Escobar, E., Levin, L.A., Menot, L., Rowden, A.A., Smith, C.R., Dover, C.L.V., 2011. Man and the Last Great Wilderness: Human Impact on the Deep Sea. PLOS ONE 6, e22588. https://doi.org/10.1371/journal.pone.0022588

Reid, S. B., Hirota, J., Young, R. E. & Hallacher, L. E. 1991. Mesopelagic-boundary community in Hawaii: micronekton at the interface between neritic and oceanic ecosystems. Marine Biology, 109, 427-440.

Resing, J. A., Sedwick, P. N., German, C. R., Jenkins, W. J., Moffett, J. W., Sohst, B. M., & Tagliabue, A. 2015. Basin-scale transport of hydrothermal dissolved metals across the South Pacific Ocean. Nature, 523, 200-206.

Rex, M.A. and Etter, R.J., 2010. Deep-sea biodiversity: pattern and scale. Harvard University Press.

Richardson, W.J. and Malme, B. 1995. Zones of Noise Influence. In: Marine Mammals and Noise. (Eds. W.J. Richardson, C.R. Greene, C.I. Malme and D.H. Thompson). Academic Press, San Diego, CA. https://doi.org/10.1016/C2009-0-02253-3.

Ridall, A. 2020, Guide to the identification of marine meiofauna. Schmidt-Rhaesa, Andreas (Ed.) Verlag Dr. Friedrich Pfeil, Munich, Germany, 2020. 608 pp.

Robbins, L. L., Hansen, M. E., Kleypas, J. A., & Meylan, S. C. 2010. CO2calc—A user friendly seawater carbon calculator for Windows, Mac OS X, and iOS (iPhone): U.S. Geological Survey Open-File Report 2010-1280. 17 p. Version 4.0.9

Roberts, D.A., Johnston, E.L., Knott, N.A., 2010. Impacts of desalination plant discharges on the marine environment: A critical review of published studies. Water Research 44, 5117–5128. https://doi.org/10.1016/j.watres.2010.04.036

Robison BH (2009) Conservation of deep pelagic biodiversity. Conservation Biology 23:847-858. doi:10.1111/j.1523-1739.2009.01219.x

Robison, B. H. 2009. Conservation of deep pelagic biodiversity. Conservation Biology, 23, 847-858.

Rolff C (2000) Seasonal variation in δ13C and δ15N of size-fractionated plankton at a coastal station in the northern Baltic proper. Mar Ecol Prog Ser 203:47-65

Romero, Isabel C., Tamay Özgökmen, Susan Snyder, Patrick Schwing, Bryan J. O'Malley, Francisco J. Beron-Vera, Maria J. Olascoaga, _et al._ 2016. 'Tracking the Hercules 265 Marine Gas Well Blowout in the Gulf of Mexico'. Journal of Geophysical Research: Oceans 121 (1): 706–24.

Romero-Romero S, Ka'apu-Lyons CA, Umhau BP, Benitez-Nelson CR, Hannides CCS, Close HG, Drazen JC, Popp BN (2020) Deep zooplankton rely on small particles when particle fluxes are low. Limnology and Oceanography Letters 5:410-416. doi:10.1002/lol2.10163

Romero-Romero S, Molina-Ramírez A, Höfer J, Acuña JL (2016) Body size-based trophic structure of a deep marine ecosystem. Ecology 97:171-181. doi:10.1890/15-0234.1

Romero-Romero, S., Choy, C.A., Hannides, C.C.S., Popp, B.N., Drazen, J.C., 2019. Differences in the trophic ecology of micronekton driven by diel vertical migration. Limnology and Oceanography 64, 1473-1483.

Roshan, S., Wu, J., & Jenkins, W. J. 2016. Long-range transport of hydrothermal dissolved Zn in the tropical South Pacific. Marine Chemistry, 183, 25-32.

Rousseeuw, P. J. 1987. Silhouettes: a graphical aid to the interpretation and validation of cluster analysis. Journal of computational and applied mathematics, 20: 53-65.

Rowden, A. A., Schlacher, T. A., Williams, A., Clark, M. R., Stewart, R., Althaus, F., Bowden, D. A., Consalvey, M., Robinson, W., Dowdney, J. 2010. A test of the seamount oasis hypothesis: seamounts support higher epibenthic megafaunal biomass than adjacent slopes. Marine Ecology, 31: 95–106.

RPS, 2009. Effects of a desalination plant discharge on the marine environment of barrow island. https://australia.chevron.com/-/media/australia/our-businesses/documents/RO-appendix-4.pdf.

Ryer, C.H., Stoner, A.W., Iseri, P.J., Spencer, M.L., 2009. Effects of simulated underwater vehicle lighting on fish behavior. Marine Ecology Progress Series 391, 97–106. https://doi.org/10.3354/meps08168

Rzeznik, A.J., Flierl, G.R., Peacock, T., 2019. Model investigations of discharge plumes generated by deep-sea nodule mining operations. Ocean Engineering 172, 684–696. https://doi.org/10.1016/j.oceaneng.2018.12.012.

Sala, E., Mayorga, J., Bradley, D., Cabral, R. B., Atwood, T. B., Auber, A., Cheung, W., Costello, C., Ferretti, F., Friedlander, A. M., Gaines, S. D., Garilao, C., Goodell, W., Halpern, B. S., Hinson, A., Kaschner, K., Kesner-Reyes, K., Leprieur, F., McGowan, J., … Lubchenco, J. (2021). Protecting the global ocean for biodiversity, food and climate. Nature, 592, 397–402.

Salomons, W., & Förstner, U. 1984. Sediments and the transport of metals. In Metals in the Hydrocycle (pp. 63-98). Springer, Berlin, Heidelberg.

Schmidt-Rhaesa, A., & Vieler, V. 2020. Validation of Spadella kappae Schmidt-Rhaesa amp; Vieler, a small benthic chaetognath from Roscoff, France (Chaetognatha). Zootaxa, 4759(2), zootaxa-4759.

Schorr, G.S., Falcone, E.A., Moretti, D.J. and Andrews, R.D., 2014. First long-term behavioral records from Cuvier's beaked whales (Ziphius cavirostris) reveal record-breaking dives. PloS one, 9(3), p.e92633.

Schwing, Patrick T., Bryan J. O'Malley, and David J. Hollander. 2018. 'Resilience of Benthic Foraminifera in the Northern Gulf of Mexico Following the Deepwater Horizon Event (2011–2015)'. Ecological Indicators 84 (January): 753–64.

Schwing, Patrick T., Isabel C. Romero, Gregg R. Brooks, David W. Hastings, Rebekka A. Larson, and David J. Hollander. 2015. 'A Decline in Benthic Foraminifera Following the Deepwater Horizon Event in the North-eastern Gulf of Mexico'. Edited by Fabiano Thompson. PLOS ONE 10 (3): e0120565.

Seibel, B.A., Schneider, J.L., Kaartvedt, S., Wishner, K.F., Daly, K.L., 2016. Hypoxia tolerance and metabolic suppression in oxygen minimum zone euphausiids: implications for ocean deoxygenation and biogeochemical cycles. Integrative and comparative biology 56, 510–523.

Sharma, R., 2011. Deep-sea mining: economic, technical, technological, and environmental considerations for sustainable development. Mar. Technol. Soc. J. 45, 28–41.

Sharma, R., 2015. Environmental issues of deep-sea mining. Procedia Earth and Planetary Science, 11, 204-211.

Shiller, A. M. (1997). Manganese in Surface Waters of the Atlantic Ocean. Geophysical Research Letters, 24(12), 1495-1498.

Shulse, Christine N., Brianne Maillot, Craig R. Smith, and Matthew J. Church. 2017. 'Polymetallic Nodules, Sediments, and Deep Waters in the Equatorial North Pacific Exhibit Highly Diverse and Distinct Bacterial, Archaeal, and Microeukaryotic Communities'. Microbiology Open 6 (2): e00428.

Sigman DM, Karsh KL, Casciotti KL (2009) Nitrogen Isotopes in the Ocean. In: Steele JH (ed) Encyclopedia of Ocean Sciences (Second Edition). Academic Press, Oxford, pp 40-54. doi:https://doi.org/10.1016/B978-012374473-9.00632-9

Silsbe, G.M., M.J. Behrenfeld, K.H. Halsey, A.J. Milligan,and T. Westberry (2016). The CAFE model: A net production model for global ocean phytoplankton. Global Biogeochem. Cycles. Volume 30: 1756-1777

Simon-Lledó, E., Bett, B. J., Huvenne, V. A., Schoening, T., Benoist, N. M., & Jones, D. O. 2019. Ecology of a polymetallic nodule occurrence gradient: Implications for deep-sea mining. Limnology and Oceanography, 64(5): 1883-1894.

Simon-Lledó, E., Bett, B.J., Huvenne, V.A., Köser, K., Schoening, T., Greinert, J. and Jones, D.O., 2019c. Biological effects 26 years after simulated deep-sea mining. _Scientific reports_, _9_(1), pp.1-13.

Simon-Lledó, E., C. Pomee, A. Ahokava, J. C. Drazen, A. B. Leitner, A. Flynn, J. Parianos, and D. O. B. Jones. 2020. Multi-scale variations in invertebrate and fish megafauna in the mid-eastern Clarion Clipperton Zone. Progress in Oceanography 187:102405.

Simon-Lledó, E., Pomee, C., Ahokava, A., Drazen, J.C., Leitner, A.B., Flynn, A., Parianos, J. and Jones, D.O.B. 2020. Multi-scale variations in invertebrate and fish megafauna in the mid-eastern Clarion Clipperton Zone. Progress in Oceanography, 187: 102405.

Simon-Lledó, Erik, Brian J. Bett, Veerle A. I. Huvenne, Kevin Köser, Timm Schoening, Jens Greinert, and Daniel O. B. Jones. 2019a. 'Biological Effects 26 Years after Simulated Deep-Sea Mining'. Scientific Reports 9 (1): 8040.

Simon-Lledó, Erik, Brian J. Bett, Veerle A. I. Huvenne, Timm Schoening, Noelie M. A. Benoist, and Daniel O. B. Jones. 2019b. 'Ecology of a Polymetallic Nodule Occurrence Gradient: Implications for Deep-sea Mining'. Limnology and Oceanography 64 (5): 1883–94.

Simon-Lledó, Erik, Brian J. Bett, Veerle A.I. Huvenne, Timm Schoening, Noelie M.A. Benoist, Rachel M. Jeffreys, Jennifer M. Durden, and Daniel O.B. Jones. 2019c. 'Megafaunal Variation in the Abyssal Landscape of the Clarion Clipperton Zone'. Progress in Oceanography 170 (January): 119–33.

Simpson, S.L. and Spadaro, D.A. (2016). Bioavailability and Chronic Toxicity of Metal Sulfide Minerals to Benthic Marine Invertebrates: Implications for Deep Sea Exploration, Mining and Tailings Disposal. Environmental Science and Technology, 50(7), American Chemical Society., pp.4061–4070. [Online]. Available at: doi:10.1021/acs.est.6b00203.

Smith, C, F Deleo, A Bernardino, A Sweetman, and P Arbizu. 2008. 'Abyssal Food Limitation, Ecosystem Structure and Climate Change'. Trends in Ecology & Evolution 23 (9): 518–28.

Smith, C. R., Berelson, W., Demaster, D. J., Dobbs, F. C., Hammond, D., Hoover, D. J., ... & Stephens, M. 1997. Latitudinal variations in benthic processes in the abyssal equatorial Pacific: control by biogenic particle flux. Deep-sea Research Part II: Topical Studies in Oceanography, 44(9-10), 2295-2317.

Smith, C. R., Hoover, D. J., Doan, S. E., Pope, R. H., Demaster, D. J., Dobbs, F. C., & Altabet, M. A. (1996). Phytodetritus at the abyssal sea floor across 10°of latitude in the central equatorial Pacific. Deep-Sea Research Part II: Topical Studies in Oceanography, 43(4–6), 1309–1338. https://doi.org/10.1016/0967-0645(96)00015-X.

Smith, C. R., Pope, R. H., DeMaster, D. J., & Magaard, L. 1993. Age-dependent mixing of deep-sea sediments. Geochimica et Cosmochimica Acta, 57(7), 1473-1488.

Smith, C., 1999. The biological environment in the nodule provinces of the deep-sea. In: Deep-Seabed Polymetallic Nodule Exploration: Development of Environmental Guidelines. Kingston, Jamaica: International Seabed Authority report

Smith, C.R. and Demopoulos, A.W., 2003. The deep Pacific Ocean floor. Ecosystems of the World, pp.179-218.

Smith, C.R., Levin, L.A., Koslow, A., Tyler, P.A. and Glover, A.G., 2008. The near future of the deep-seafloor ecosystems. Aquatic ecosystems: trends and global prospects, pp.334-352.

Smith, Craig R., Robin H. Pope, David J. DeMaster, and Lorenz Magaard. 1993. 'Age-Dependent Mixing of Deep-Sea Sediments'. Geochimica et Cosmochimica Acta 57 (7): 1473–88.

Smith, Craig R., Will Berelson, David J. Demaster, Fred C. Dobbs, Doug Hammond, Daniel J. Hoover, Robert H. Pope, and Mark Stephens. 1997. 'Latitudinal Variations in Benthic Processes in the Abyssal Equatorial Pacific: Control by Biogenic Particle Flux'. Deep-sea Research Part II: Topical Studies in Oceanography 44 (9–10): 2295–2317.

Smith, K.L., Ruhl, H.A., Bett, B.J., Billett, D.S.M., Lampitt, R.S. and Kaufmann, R.S., 2009. Climate, carbon cycling, and deep-ocean ecosystems. Proceedings of the National Academy of Sciences, 106(46), pp.19211-19218.

Snelgrove, P.V.R. and Smith, C.R., 2002. A riot of species in an environmental calm: the paradox of the species-rich deep-sea. Oceanogr. Mar. Biol. Annu. Rev. 40, 311–342.

Somero, G.N. 1990. Life at low volume change: Hydrostatic pressure as a selective factor in the aquatic environment. Integrative and Comparative Biology, 30(1), pp.123–135. [Online]. Available at: doi:10.1093/icb/30.1.123.

Somero, G.N. (1992). Adaptations to High Hydrostatic Pressure. Annual Review of Physiology, 54(1), Annual Reviews 4139 El Camino Way, P.O. Box 10139, Palo Alto, CA 94303-0139, USA, pp.557–577. [Online]. Available at: doi:10.1146/annurev.ph.54.030192.003013 [Accessed 29 January 2021].

Sommer, S. A., Woudenberg, L. V., Lenz, P. H., Cepeda, G., Goetze, E. 2017. Vertical gradients in species richness and community composition across the twilight zone in the North Pacific Subtropical Gyre. Molecular Ecology, 26, 6136-6156.

Southall, B.L., Bowles, A.E., Ellison, W.T., Finneran, J.J., Gentry, R.L., Greene Jr, C.R., Kastak, D., Ketten, D.R., Miller, J.H., Nachtigall, P.E. and Richardson, W.J., 2007. Structure of the noise exposure criteria. _Aquatic mammals_, _33_(4), p.427.

SPC, 2013. Deep Sea Minerals: Manganese nodules-a physical, biological, environmental, and technical review. South Pacific Community.

Spearman, J., Taylor, J., Crossouard, N., Cooper, A., Turnbull, M., Manning, A.,& Murton, B. 2020. Measurement and modelling of deep-sea sediment plumes and implications for deep-sea mining. Scientific reports, 10(1), 1-14.

Spiess F.N., R. Hessler, G. Wilson and M. Weydert, 1987. Environmental effects of deep sea dredging, NOAA Report, 87-5: 1-85.

Speziale, L., and Geneletti, D. (2014). Applying an ecosystem services approach to support land-use planning: a case study in Koboko district, Uganda. Ecological Processes, 3(1), 1-13.

Standards Australia. 2009. AS/NZS ISO 31000-2009. Risk management: principles and guidelines. Prepared by Standards Australia Ltd. Sydney, NSW, Australia.

Standards Australia. 2012. HB 203:2012 Managing environment-related risk. Prepared by Standards Australia Ltd. Sydney, NSW, Australia.

Standards Australia. 2013. SA/SNZ HB 436:2013 (Guidelines to AS/NZS ISO 31000:2009). Risk management guidelines - Companion to AS/NZS ISO 31000:2009. Prepared by Standards Australia Ltd. Sydney, NSW, Australia.

Stephens M.P, Kadko D. C, Smith C. R, Latasa M. (1997). Chlorophyll-a and phaeopigments as tracers of labile organic carbon at the central equatorial Pacific seafloor. Geochim. 61(21):4605-4619.

Stock, B.C. and Semmens, B.X., 2013. MixSIAR GUI user manual. Version 3.1.

Stoyanova, V., 2012. Megafaunal diversity associated with deep-sea nodule-bearing habitats in the eastern part of the clarion-clipperton zone, NE pacific. International Multidisciplinary Scientific GeoConference: SGEM, 1, p.645.

Stratmann T, Soetaert K, Kersken D, van Oevelen D. 2021. Polymetallic nodules are essential for food-web integrity of a prospective deep-seabed mining area in Pacific abyssal plains. Scientific Reports 11, 12238. https://doi.org/10.1038/s41598-021-91703-4

Stratmann, T., Soetaert, K., Wei, CL. _et al._ The SCOC database, a large, open, and global database with sediment community oxygen consumption rates. _Sci Data_ **6,** 242 (2019). https://doi.org/10.1038/s41597-019-0259-3

Stratmann, Tanja, Ilja Voorsmit, Andrey Gebruk, Alastair Brown, Autun Purser, Yann Marcon, Andrew K. Sweetman, Daniel O. B. Jones, and Dick van Oevelen. 2018. 'Recovery of Holothuroidea Population Density, Community Composition, and Respiration Activity after a Deep-sea Disturbance Experiment'. Limnology and Oceanography 63 (5): 2140–53.

Strindberg, S., Buckland, S.T., 2004. Zigzag survey designs in line transect sampling. Journal of Agricultural, Biological, and Environmental Statistics, 9, 443-461.

Sulpis, O., Boudreauc, B. P., Mucci, A., Jenkins, C., Trossman, D. S., Arbic, B. K., & Key, R. M. 2018. Current CaCO3 dissolution at the seafloor caused by anthropogenic CO2.

Sweetman, A. K., & Witte, U. 2008a. Response of an abyssal macrofaunal community to a phytodetrital pulse. Marine Ecology Progress Series, 355, 73-84.

Sweetman, A. K., & Witte, U. 2008b. Macrofaunal response to phytodetritus in a bathyal Norwegian fjord. Deep-sea Research Part I: Oceanographic Research Papers, 55(11), 1503-1514.

Sweetman, A. K., Chelsky, A., Pitt, K. A., Andrade, H., van Oevelen, D., & Renaud, P. E. 2016. Jellyfish decomposition at the seafloor rapidly alters biogeochemical cycling and carbon flow through benthic food-webs. Limnology and Oceanography, 61(4), 1449-1461.

Sweetman, A. K., Middelburg, J. J., Berle, A. M., Bernardino, A. F., Schander, C., Demopoulos, A. W. J., & Smith, C. R. 2010. Impacts of exotic mangrove forests and mangrove deforestation on carbon remineralization and ecosystem functioning in marine sediments. Biogeosciences, 7(7), 2129-2145.

Sweetman, A. K., Sommer, S., Pfannkuche, O., & Witte, U. 2009. Retarded response by macrofauna-size foraminifera to phytodetritus in a deep Norwegian fjord. The Journal of Foraminiferal Research, 39(1), 15-22.

Sweetman, A.K., Thurber, A.R., Smith, C.R., Levin, L.A., Mora, C., Wei, C.-L., Gooday, A.J., Jones, D.O.B., Rex, M., Yasuhara, M., Ingels, J., Ruhl, H.A., Frieder, C.A., Danovaro, R., Würzberg, L., Baco, A., Grupe, B.M., Pasulka, A., Meyer, K.S., Dunlop, K.M., Henry, L.-A., Roberts, J.M., 2017. Major impacts of climate change on deep-sea benthic ecosystems. Elementa: Science of the Anthropocene 5, 4. https://doi.org/10.1525/elementa.203.

Sweetman, Andrew K., Craig R. Smith, Christine N. Shulse, Brianne Maillot, Markus Lindh, Matthew J. Church, Kirstin S. Meyer, Dick Oevelen, Tanja Stratmann, and Andrew J. Gooday. 2019. 'Key Role of Bacteria in the Short-term Cycling of Carbon at the Abyssal Seafloor in a Low Particulate Organic Carbon Flux Region of the Eastern Pacific Ocean'. Limnology and Oceanography 64 (2): 694–713.

Sweetman, Andrew K., Craig R. Smith, Trine Dale, and Daniel O. B. Jones. 2014a. 'Rapid Scavenging of Jellyfish Carcasses Reveals the Importance of Gelatinous Material to Deep-Sea Food Webs'. Proceedings of the Royal Society B: Biological Sciences 281 (1796): 20142210.

Sweetman, Andrew K., Karl Norling, Carina Gunderstad, Barbro T. Haugland, and Trine Dale. 2014b. 'Benthic Ecosystem Functioning beneath Fish Farms in Different Hydrodynamic Environments'. Limnology and Oceanography 59 (4): 1139–51.

Syväranta J, Hämäläinen H, Jones RI. 2006. Within-lake variability in carbon and nitrogen stable isotope signatures. Freshwater Biology 51:1090-1102

Taboada, S., Riesgo, A., Wiklund, H., Paterson, G.L.J., Koutsouveli, V., Santodomingo, N., Dale, A.C., Smith, C.R., Jones, D.O.B., Dahlgren, T.G., Glover, A.G., 2018. Implications of population connectivity studies for the design of marine protected areas in the deep sea: An example of a demosponge from the Clarion-Clipperton Zone. Mol Ecol 27, 4657–4679. https://doi.org/10.1111/mec.14888

Tamburini, C., Garcin, J., Ragot, M. and Bianchi, A., 2002. Biopolymer hydrolysis and bacterial production under ambient hydrostatic pressure through a 2000 m water column in the NW Mediterranean. _Deep Sea Research Part II: Topical Studies in Oceanography_, _49_(11), pp.2109-2123.

Tennøy, A., Kværner, J., Gjerstad, K.I., 2006. Uncertainty in environmental impact assessment predictions: the need for better communication and more transparency. Impact Assess. Proj. Apprais. 24 (1), 45–56.

Thiel, H., G. Schriever, C. Bussau, and C. Borowski. 1993. 'Manganese Nodule Crevice Fauna'. Deep-sea Research Part I: Oceanographic Research Papers 40 (2): 419–23.

Thurber, A. R., A. K. Sweetman, B. E. Narayanaswamy, D. O. B. Jones, J. Ingels, and R. L. Hansman. 2014. 'Ecosystem Function and Services Provided by the Deep-sea'. Biogeosciences 11 (14): 3941–63.

Tilot, Virginie, Rupert Ormond, Juan Moreno Navas, and Teresa S. Catalá. 2018. 'The Benthic Megafaunal Assemblages of the CCZ (Eastern Pacific) and an Approach to Their Management in the Face of Threatened Anthropogenic Impacts'. Frontiers in Marine Science 5 (February): 7.

TMC. 2020. Campaign 5A 16/10/20 – 30/11/20. Benthic Biology. Post Campaign Report. Internal Metals Company Report.

TMC. 2021b. Campaign 5D. 27/4/21 – 12/6/21. Benthic Biology. Post Campaign Report. Internal Metals Company Report.

Toggweiler JR, Key RM. 2003. Ocean Circulation / Thermohaline Circulation In: Encyclopedia of Atmospheric Sciences, Vol. 4, San Diego, CA, Academic Press, 1549-1555.

Ueda K, Morgan SL, Fox A, Gilbart J, Sonesson A, Larsson L, Odham G. 1989. D-Alanine as a chemical marker for the determination of streptococcal cell wall levels in mammalian tissues by gas chromatography/negative ion chemical ionization mass spectrometry. Analytical Chemistry 61:265-270. doi:10.1021/ac00178a015

Uhlenkott, K., Vink, A., Kuhn, T., Gillard, B., Martínez Arbizu, P., 2021. Meiofauna in a Potential Deep-Sea Mining Area—Influence of Temporal and Spatial Variability on Small-Scale Abundance Models. Diversity 13, 3.

Uhlenkott, Katja, Annemiek Vink, Thomas Kuhn, Benjamin Gillard, and Pedro Martínez Arbizu. 2020. 'Meiofauna in a Potential Deep-Sea Mining Area—Influence of Temporal and Spatial Variability on Small-Scale Abundance Models'. Diversity 13 (1): 3.

Underwood A.J. 1996, Environmental Design and Analysis in Marine Environmental Sampling. IOC Manuals and Guides No. 34, UNESCO.

United Nations (UN)., 2016. Agreement relating to the implementation of Part XI of the United Nations Convention on the Law of the Sea of 10 December 1982. Overview. Oceans and Law of the Seas. United Nations. https://www.un.org/Depts/los/convention_agreements/convention_overview_part_xi.htm Accessed 3 December 2020.

University of Hawaii (UOH). 2022. Annual Report Characterization and Monitoring of the Water Column Ecosystem in the Eastern CCZ (NORI-D). Report prepared for The Metals Company. Submitted 17/12/21.

USEPA (United States Environmental Protection Agency) 2007 Framework for metals risk assessment. Office of the Science Advisor, USEPA, EPA 120/R-07/001, Washington, DC.

USEPA (United States Environmental Protection Agency) 2000. Guidance for assessing chemical contaminant data for use in fish advisories. Office of Water, Vol. 1: Fish sampling and analysis, 3rd edition, USEPA, EPA 823-B-00-007, Washington, DC.

Valencia, Bellineth, Michael R. Landry, Moira Décima, and Cecelia C. S. Hannides. 2016. 'Environmental Drivers of Mesozooplankton Biomass Variability in the North Pacific Subtropical Gyre'. Journal of Geophysical Research: Biogeosciences 121 (12): 3131–43.

Van der Grient JMA, Drazen JC. 2021. Potential spatial intersection between high-seas fisheries and deep-sea mining in international waters. Marine Policy, 129(2021), 104564.

van der Schaar, M., Sole, M. and Andre, M. 2020. Blue Nodules Deliverable Report: D5.6 Report on underwater noise. Blue Nodules Project.

Van Dover, C.L., Szuts, E.Z., Chamberlain, S.C., Cann, J.R., 1989. A novel eye in "eyeless" shrimp from hydrothermal vents of the Mid-Atlantic Ridge. Nature 337, 458–460. https://doi.org/10.1038/337458a0

van Nugteren, P., Moodley, L., Brummer, G. J., Heip, C. H., Herman, P. M., & Middelburg, J. J. (2009). Seafloor ecosystem functioning: the importance of organic matter priming. Marine biology, 156(11), 2277-2287.

Van Oevelen, D., Soetaert, K., Middelburg, J.J., Herman, P.M., Moodley, L., Hamels, I., Moens, T. and Heip, C.H., 2006. Carbon flows through a benthic food web: Integrating biomass, isotope and tracer data. _Journal of Marine Research_, _64_(3), pp.453-482.

Van Wijk, J. M., & de Hoog, E. 2020. Size reduction of CCZ polymetallic nodules under repeated impact fragmentation. Results in Engineering, 7, 100154.

Vanreusel, A., Hilario, A., Ribeiro, P.A., Menot, L. and Arbizu, P.M. (2016). Threatened by mining, polymetallic nodules are required to preserve abyssal epifauna Polymetallic nodule mining at abyssal depths in the Clarion Clipperton Fracture Zone (Eastern Central. Nature Publishing Group. [Online]. Available at: doi:10.1038/srep26808.

Vanreusel, A., Hilario, A., Ribeiro, P.A., Menot, L. and Arbizu, P.M., 2016. Threatened by mining, polymetallic nodules are required to preserve abyssal epifauna. Scientific reports, 6, p.26808.

Verichev, S., van Rhee, C., Jak, R., Lagerveld, S., de Vries, P., Wit, L., Duineveld, G., Lavaleye, M., Huisman, M., Nijhof, M., von Benda-Beckmann, S., Steenbrink, S., Raalte, G., Boomsma, W., Ortega, A., Campman, M., Haddorp, R., 2014. Towards Zero Impact of Deep Sea Offshore Projects.

Viarengo, A., Ponzano, E., Dondero, F. and Fabbri, R., 1997. A simple spectrophotometric method for metallothionein evaluation in marine organisms: an application to Mediterranean and Antarctic molluscs. _Marine environmental research_, _44_(1), pp.69-84.

Vithana, M.V.P., Xu, M., Zhao, X., Zhang, M. and Luo, Y., 2019. Geological and geophysical signatures of the East Pacific Rise 8–10 N. Solid Earth Sciences, 4(2), pp.66-83.

Volz, J. B., Haffert, L., Haeckel, M., Koschinsky, A., & Kasten, S. 2020. Impact of small-scale disturbances on geochemical conditions, biogeochemical processes and element fluxes in surface sediments of the eastern Clarion–Clipperton Zone, Pacific Ocean. Biogeosciences, 17(4), 1113-1131.

Volz, J. B., Liu, B., Köster, M., Henkel, S., Koschinsky, A., & Kasten, S. 2020. Post-depositional manganese mobilization during the last glacial period in sediments of the eastern Clarion-Clipperton Zone, Pacific Ocean. Earth and Planetary Science Letters, 532, 116012.

Volz, J.B., Mogollón, J.M., Geibert, W., Arbizu, P.M., Koschinsky, A. and Kasten, S., 2018. Natural spatial variability of depositional conditions, biogeochemical processes and element fluxes in sediments of the eastern Clarion-Clipperton Zone, Pacific Ocean. Deep-sea Research Part I: Oceanographic Research Papers, 140, pp.159-172.

Vonnahme, T. R., M. Molari, F. Janssen, F. Wenzhöfer, M. Haeckel, J. Titschack, and A. Boetius. 2020. 'Effects of a Deep-Sea Mining Experiment on Seafloor Microbial Communities and Functions after 26 Years'. Science Advances 6 (18): eaaz5922.

Wakefield, W.W., Genin, A., 1987. The use of a Canadian (perspective) grid in deep-sea photography. Deep-sea Research Part A. Oceanographic Research Papers, 34, 469-478.

Wang, C. S., Li Liao, Hong-Xiang Xu, Xue-Wei Xu, Min Wu, and Li-Zhong Zhu. 2010. 'Bacterial Diversity in the Sediment from Polymetallic Nodule Fields of the Clarion-Clipperton Fracture Zone'. The Journal of Microbiology 48 (5): 573–85.

Washburn, T. W., Jones, D. O. B., Wei, C.-L., & Smith, C. R. 2021. Environmental heterogeneity throughout the Clarion-Clipperton Zone and the potential representativity of the APEI Network. Frontiers in Marine Science.

Washburn, T.W., Lenaick Menot, Paulo Bonifácio, Ellen Pape, Magdalena Błażewicz, Guadalupe Bribiesca-Contreras, Thomas G. Dahlgren, _et al._ 2021. 'Patterns of Macrofaunal Biodiversity Across the Clarion-Clipperton Zone: An Area Targeted for Seabed Mining'. Frontiers in Marine Science 8 (April): 626571.

Washburn, T.W., Turner, P.J., Durden, J.M., Jones, D.O.B., Weaver, P., Van Dover, C.L., 2019. Ecological risk assessment for deep-sea mining. Ocean and Coastal Management 176, 24–39. https://doi.org/10.1016/j.ocecoaman.2019.04.014.

Watson, A. J., Schuster, U., Shutler, J. D., Holding, T., Ashton, I., Landschützer, P., Woolf, D. K., & Goddijn-Murphy, L. 2020. Revised estimates of ocean-atmosphere CO2 flux are consistent with ocean carbon inventory. Nature Communications, 11, 4422.

Weaver, P.P., Billett, D., 2019. Environmental impacts of nodule, crust and sulphide mining: an overview. Environmental Issues of Deep-Sea Mining 27–62.

Wedding, L.M., Friedlander, A.M., Kittinger, J.N., Watling, L., Gaines, S.D., Bennett, M., Hardy, S.M. and Smith, C.R., 2013. From principles to practice: a spatial approach to systematic conservation planning in the deep-sea. Proceedings of the Royal Society B: Biological Sciences, 280(1773), p.20131684.

Wegorzewski and Kuhn, 2014 The influence of suboxic diagenesis on the formation of manganese nodules in the Clarion Clipperton nodule belt of the Pacific Ocean Mar. Geol., 357 (2014), pp. 123-138, 10.1016/j.margeo.2014.07.004

Wei, Chih-Lin, Gilbert T. Rowe, Elva Escobar-Briones, Antje Boetius, Thomas Soltwedel, M. Julian Caley, Yousria Soliman, _et al._ 2010. 'Global Patterns and Predictions of Seafloor Biomass Using Random Forests'. Edited by Tamara Natasha Romanuk. PLoS ONE 5 (12): e15323.

Weilgart, L. (2018). The impact of ocean noise pollution on fish and invertebrates. Report for OceanCare, Switzerland. 34 pp.

Wenzhöfer, F, M Adler, O Kohls, C Hensen, B Strotmann, S Boehme, and H. D Schulz. 2001. 'Calcite Dissolution Driven by Benthic Mineralization in the Deep-Sea: In Situ Measurements of Ca2+, PH, PCO2 and O2'. Geochimica et Cosmochimica Acta 65 (16): 2677–90.

Widder, E.A., Robison, B.H., Reisenbichler, K.R., Haddock, S.H.D., 2005. Using red light for in situ observations of deep-sea fishes. Deep Sea Research Part I: Oceanographic Research Papers 52, 2077–2085. https://doi.org/10.1016/j.dsr.2005.06.007

Wiebe, P.H., Morton, A.W., Bradley, A.M., Backus, R.H., Craddock, J.E., Barber, V., Cowles, T.J., Flierl, G.R., 1985. New developments in the MOCNESS, an apparatus for sampling zooplankton and micronekton. Marine Biology 87 (3), 313-323.

Wiklund, Helena, Lenka Neal, Adrian G. Glover, Regan Drennan, Muriel Rabone, and Thomas G. Dahlgren. 2019. 'Abyssal Fauna of Polymetallic Nodule Exploration Areas, Eastern Clarion-Clipperton Zone, Central Pacific Ocean: Annelida: Capitellidae, Opheliidae, Scalibregmatidae, and Travisiidae'. ZooKeys 883 (October): 1–82.

Wilber, D.H. and Clarke, D.G., 2001. Biological effects of suspended sediments: a review of suspended sediment impacts on fish and shellfish with relation to dredging activities in estuaries. North American Journal of Fisheries Management, 21(4), pp.855-875.

Williams R, Wright AJ, Ashe E, Blight LK, Bruintjes R, Canessa R, Clark CW, Cullis-Suzuki S, Dakin DT, Erbe C, Hammond PS, Merchant MD, O'Hara PD, Purser J, Radford AN, Simpson SD, Thomas L, Wale MA. 2015. Impacts of anthropogenic noise on marine life: publication patterns, new discoveries, and future directions in research and management. Ocean and Coastal Management , vol. 115 , pp. 17-24

Wilson, G. D. F. 2017. 'Macrofauna Abundance, Species Diversity and Turnover at Three Sites in the Clipperton-Clarion Fracture Zone'. Marine Biodiversity 47 (2): 323–47.

Winters, H., Isquith, I.R., Bakish, R., 1979. Influence of desalination effluents on marine ecosystems. Desalination 30, 403–410. https://doi.org/10.1016/S0011-9164(00)88470-2.

Wishner, K. F. 1980a. 'Aspects of the Community Ecology of Deep-Sea, Benthopelagic Plankton, with Special Attention to Gymnopleid Copepods'. Marine Biology 60 (2): 179–87.

Wishner, K. F., B. Seibel, and D. Outram. 2020. Ocean deoxygenation and copepods: coping with oxygen minimum zone variability. Biogeosciences 17:2315-2339.

Wishner, K. F., D. M. Outram, B. A. Seibel, K. L. Daly, and R. L. Williams. 2013. 'Zooplankton in the Eastern Tropical North Pacific: Boundary Effects of Oxygen Minimum Zone Expansion'. Deep-sea Research Part I: Oceanographic Research Papers 79 (September): 122–40.

Wishner, K.F. 1980b. 'The Biomass of the Deep-Sea Benthopelagic Plankton'. Deep-sea Research Part A. Oceanographic Research Papers 27 (3–4): 203–16.

Wishner, K.F., Gelfman, C., Gowing, M.M., Outram, D.M., Rapien, M., Williams, R.L., 2008. Vertical zonation and distributions of calanoid copepods through the lower oxycline of the Arabian Sea oxygen minimum zone. Progress in Oceanography 78, 163–191.

Wishner, K.F., Seibel, B.A., Roman, C., Deutsch, C., Outram, D., Shaw, C.T., Birk, M.A., Mislan, K.A.S., Adams, T.J., Moore, D., Riley, S., 2018. Ocean deoxygenation and zooplankton: Very small oxygen differences matter. Science Advances. https://doi.org/10.1126/sciadv.aau5180

Wisner RL (1974) The taxonomy and distribution of lanterfishes (Family Myctophidae) of the eastern Pacific Ocean. NORDA, Bay St. Louis, MI

Witbaard R, Duineveld G.C.A, Van der Weele J.A, Berghuis E.M, Reyss J.P. 1999. The benthic response to the seasonal deposition of phytopigments at the Porcupine Abyssal Plain in the North East Atlantic. J Sea Res. 43(1):15-31.

Woulds, C., W. Homoky and A, Lough (UOL). 2021. Benthic Biogeochemistry Baseline for NORI-D. University of Leeds annual report 2020/21 for The Metals Company.

Xodus. 2016. Marine Noise Inputs; Technical note on underwater noise. Report No. A-100142- S20-TECH-001. Prepared by Xodus Group Ltd for Statoil Wind Limited.

Yamaguchi, Atsushi, Yuji Watanabe, Hiroshi Ishida, Takashi Harimoto, Kazushi Furusawa, Shinya Suzuki, Joji Ishizaka, Tsutomu Ikeda, and Masayuki Mac Takahashi. 2002. 'Community and Trophic Structures of Pelagic Copepods down to Greater Depths in the Western Subarctic Pacific (WEST-COSMIC)'. Deep-sea Research Part I: Oceanographic Research Papers 49 (6): 1007–25.

Young, R. E. 1978. 'Vertical Distribution and Photosensitive Vesicles Of Pelagic Cephalopods From Hawaiian Waters', 33.

Zeppilli, Daniela, Ann Vanreusel, and Roberto Danovaro. 2011. 'Cosmopolitanism and Biogeography of the Genus Manganonema (Nematoda: Monhysterida) in the Deep-sea'. Animals 1 (3): 291–305.

Zinssmeister, Carmen, Tanja Wilke, and Mona Hoppenrath. 2017. 'Species Diversity of Dinophysoid Dinoflagellates in the Clarion–Clipperton Fracture Zone, Eastern Pacific'. Marine Biodiversity 47 (2): 271–87.