

DAFTAR PUSTAKA

- Abràmoff, M. D., Magalhães, P. J., & Ram, S. J. (2004). Image processing with ImageJ. *Biophotonics International*, 11, 36–42. <https://imagescience.org/meijering/publications/download/bio2004.pdf>
- Ambo-Rappe, R., & Moore, A. M. (2019). Sulawesi Seas, Indonesia. In C. Sheppard (Ed.), *World Seas: an Environmental Evaluation* (Second Ed., pp. 559–581). Elsevier. <https://doi.org/10.1016/B978-0-08-100853-9.00032-4>
- Barott, K., Williams, G., Vermeij, M., Harris, J., Smith, J., Rohwer, F., & Sandin, S. (2012). Natural history of coral–algae competition across a gradient of human activity in the Line Islands. *Marine Ecology Progress Series*, 460, 1–12. <https://doi.org/10.3354/meps09874>
- Bégin, C., Fry, J., & Cucknell, M. (n.d.). *Introduction to Marine Biology Lecture Notes*. <https://www.seamester.com/pdf/student-academic-materials/OCB-student-handbook-v3.6.pdf>
- Bellwood, D. R., Streit, R. P., Brandl, S. J., & Tebbett, S. B. (2019). The meaning of the term ‘function’ in ecology: A coral reef perspective. *Functional Ecology*, 33(6), 948–961. <https://doi.org/10.1111/1365-2435.13265>
- Blanchon, P. (2011). Geomorphic Zonation. In *Encyclopedia of Earth Sciences Series: Vol. Part 2* (Issue November 2011, pp. 469–486). https://doi.org/10.1007/978-90-481-2639-2_33
- Brown, K. T., Bender-Champ, D., Kubicek, A., van der Zande, R., Achlatis, M., Hoegh-Guldberg, O., & Dove, S. G. (2018). The dynamics of coral-algal interactions in space and time on the southern Great Barrier Reef. *Frontiers in Marine Science*, 5(MAY), 1–13. <https://doi.org/10.3389/fmars.2018.00181>
- Bruno, J. F., Selig, E. R., Casey, K. S., Page, C. A., Willis, B. L., Harvell, C. D., Sweatman, H., & Melendy, A. M. (2007). Thermal Stress and Coral Cover as Drivers of Coral Disease Outbreaks. *PLoS Biology*, 5(6), e124. <https://doi.org/10.1371/journal.pbio.0050124>
- Candri, D. A., Ahyadi, H., Riandinata, S. K., & Virgotta, A. (2018). *Inventory of Biota Associated on Coral Reefs Ecosystem at Gili Tangkong , West Lombok District. October*, 307–314.
- Charpy, L., Casareto, B. E., Langlade, M. J., & Suzuki, Y. (2012). Cyanobacteria in Coral Reef Ecosystems: A Review. *Journal of Marine Biology*, 2012, 1–9. <https://doi.org/10.1155/2012/259571>
- Chaves-Fonnegra, A. (2014). Increase of excavating sponges on Caribbean coral reefs: Reproduction, dispersal, and coral deterioration. In *Oceanographic Center: Vol.*

Doctoral (Issue 5).

- Connell, S., Foster, M., & Airoidi, L. (2014). What are algal turfs? Towards a better description of turfs. *Marine Ecology Progress Series*, 495, 299–307. <https://doi.org/10.3354/meps10513>
- Coral Structure and Fuction* (pp. 1–10). (n.d.). https://coast.noaa.gov/data/SEAMedia/Lessons/G3U3L2_Coral_Structure_and_Function.pdf
- Dianastuty, E. H., Trianto, A., & Sedjati, S. (2016). *Studi Kompetisi Turf Algae Dan Karang Genus Acropora*. 600–608.
- Fahriansyah, Gaol, J. L., & Panjaitan, J. P. (2017). Pemetaan Geomorfologi Terumbu Karang Pulau Tunda Menggunakan Klasifikasi Berbasis Objek Coral Reef Geomorphic Mapping of Tunda Island Using Object Base Classification. *Jurnal Teknologi Perikanan Dan Kelautan*, 8(2), 147–156.
- Faizal, A., Amri, K., Rani, C., Nessa, M. N., & Jompa, J. (2020). Dynamic model; the effects of eutrophication and sedimentation on the degradation of Coral Reefs in Spermonde Archipelago, Indonesia. *IOP Conference Series: Earth and Environmental Science*, 564(1), 012084. <https://doi.org/10.1088/1755-1315/564/1/012084>
- Feng, M., Zhang, N., Liu, Q., & Wijffels, S. (2018). The Indonesian throughflow, its variability and centennial change. *Geoscience Letters*, 5(1), 3. <https://doi.org/10.1186/s40562-018-0102-2>
- Ferse, S. C. A., Knittweis, L., Krause, G., Maddusila, A., & Glaser, M. (2012). Livelihoods of Ornamental Coral Fishermen in South Sulawesi/Indonesia: Implications for Management. *Coastal Management*, 40(5), 525–555. <https://doi.org/10.1080/08920753.2012.694801>
- Fong, C. R., Bittick, S. J., & Fong, P. (2018). Simultaneous synergist, antagonistic and additive interactions between multiple local stressors all degrade algal turf communities on coral reefs. *Journal of Ecology*, 106(4), 1390–1400. <https://doi.org/10.1111/1365-2745.12914>
- Fuad, M. A. Z. (2010). *Coral Reef Rugosity and Coral Biodiversity* [International Institute Geo-Information Science and Earth Observation Enschede]. https://webapps.itc.utwente.nl/librarywww/papers_2010/msc/nrm/fuad.pdf
- Fudjaja, L., Viantika, N. M., Rani, C., Nurdin, N., Priosambodo, D., & Tenriawaru, A. N. (2020). Anthropogenic activity and the destruction of coral reefs in the waters of small islands. *IOP Conference Series: Earth and Environmental Science*, 575(1), 012057. <https://doi.org/10.1088/1755-1315/575/1/012057>
- Glaser, M., Breckwoldt, A., Deswandi, R., Radjawali, I., Baitoningsih, W., & Ferse, S. C.

- A. (2015). Of exploited reefs and fishers – A holistic view on participatory coastal and marine management in an Indonesian archipelago. *Ocean & Coastal Management*, 116, 193–213. <https://doi.org/10.1016/j.ocecoaman.2015.07.022>
- Gómez-Cubillos, C., Gómez-Cubillos, C., Sanjuan-Muñoz, A., & Zea, S. (2019). Interactions of massive corals with turf algae and other reef organisms in Tayrona National Natural Park. *Boletín de Investigaciones Marinas y Costeras*, 48(2), 143–171. <https://doi.org/10.25268/bimc.invemar.2019.48.2.770>
- Gómez Cubillos, M. C., Sanjuan Muñoz, A., Zea, S. E., Gómez-Cubillos, C., Gómez-Cubillos, C., Gómez-Cubillos, C., Sanjuan-Muñoz, A., & Zea, S. (2019). Interacciones de corales masivos con céspedes algales y otros organismos en arrecifes del Parque Nacional Natural Tayrona. *Bulletin of Marine and Coastal Research*, 48(2), 143–171. <https://doi.org/10.25268/bimc.invemar.2019.48.2.770>
- Gordon, A. L., Susanto, R. D., & Vranes, K. (2003). Cool Indonesian throughflow as a consequence of restricted surface layer flow. *Nature*, 425(6960), 824–828. <https://doi.org/10.1038/nature02038>
- Haas, A., El-Zibdah, M., & Wild, C. (2010). Seasonal monitoring of coral–algae interactions in fringing reefs of the Gulf of Aqaba, Northern Red Sea. *Coral Reefs*, 29(1), 93–103. <https://doi.org/10.1007/s00338-009-0556-y>
- Hadi, T. A., Giyanto, Prayudha, B., Hafizt, M., Budiyanto, A., & Suharsono. (2018). *Terumbu Karang Indonesia*. Pusat Penelitian Oseanografi (LIPI).
- Harris, J. L. (2015). The Ecology of Turf Algae on Coral Reefs [University Of California]. In *ProQuest Dissertations and Theses*. <https://escholarship.org/uc/item/7gb5h3zm>
- Hughes, T. P. (1994). Catastrophes, phase shifts, and large-scale degradation of a Caribbean coral reef. *Science*, 265(5178), 1547–1551. <https://doi.org/10.1126/science.265.5178.1547>
- Jalil, A. R. (2013). Distribusi kecepatan arus pasang surut pada muson peralihan barat-timur terkait hasil tangkapan ikan pelagis kecil di perairan Spermonde Distribution of tidal current velocities transition monsoon east-west related to small pelagic fish catches in Spermon. *Depik*, 2(April), 26–32.
- Jalil, A. R., Nurjannah, N., Iqbal, A. B., & Hatta, M. (2014). Karakter Oseanografi Perairan Makassar Terkait Zona Potensial Penangkapan Ikan Pelagis Kecil Pada Musim Timur. *Jurnal IPTEKS PSP*, 1(1), 69–80.
- Jompa, J. (1996). *Monitoring and Assessment of Coral Reefs in Spermonde Archipelago, South Sulawesi, Indonesia* [McMaster University]. <http://hdl.handle.net/11375/22569>
- Jompa, J. (2001). Interactions between macroalgae and scleractinian corals in the context of reef degradation . PhD thesis, James Cook University. *PhD Thesis*.

- <http://eprints.jcu.edu.au/27497/>
- Jompa, J., & McCook, L. (2003a). Coral-algal competition: macroalgae with different properties have different effects on corals. *Marine Ecology Progress Series*, 258, 87–95. <https://doi.org/10.3354/meps258087>
- Jompa, J., & McCook, L. J. (2003b). Contrasting effects of turf algae on corals: Massive *Porites* spp. are unaffected by mixed-species turfs, but killed by the red alga *Anotrichium tenue*. *Marine Ecology Progress Series*, 258(McCook 1999), 79–86. <https://doi.org/10.3354/meps258079>
- Karcher, D. B., Roth, F., Carvalho, S., El-Khaled, Y. C., Tilstra, A., Kürten, B., Struck, U., Jones, B. H., & Wild, C. (2020). Nitrogen eutrophication particularly promotes turf algae in coral reefs of the central Red Sea. *PeerJ*, 2020(4), 1–25. <https://doi.org/10.7717/peerj.8737>
- Kench, P. S., & Mann, T. (2017). Reef Island Evolution and Dynamics: Insights from the Indian and Pacific Oceans and Perspectives for the Spermonde Archipelago. *Frontiers in Marine Science*, 4(MAY). <https://doi.org/10.3389/fmars.2017.00145>
- Kohler, K. E., & Gill, S. M. (2006). Coral Point Count with Excel extensions (CPCe): A Visual Basic program for the determination of coral and substrate coverage using random point count methodology. *Computers and Geosciences*, 32(9), 1259–1269. <https://doi.org/10.1016/j.cageo.2005.11.009>
- Kovacs, E., Lyons, M., Roe, B.-A. R., Yuwono D, Wolff J, Tudman P, Murray N, & Phinn S. (2020). *Reef Cover Classification Coral reef internal class descriptors for global habitat mapping*. July.
- Leong, R. C., Marzinelli, E. M., Low, J., Bauman, A. G., Lim, E. W. X., Lim, C. Y., Steinberg, P. D., & Guest, J. R. (2018). Effect of coral-algal interactions on early life history processes in *Pocillopora acuta* in a highly disturbed coral reef system. *Frontiers in Marine Science*, 5(OCT), 1–11. <https://doi.org/10.3389/fmars.2018.00385>
- Liao, Z., Yu, K., Wang, Y., Huang, X., & Xu, L. (2019). Coral-algal interactions at Weizhou Island in the northern South China Sea: Variations by taxa and the exacerbating impact of sediments trapped in turf algae. *PeerJ*, 2019(3), 6590. <https://doi.org/10.7717/peerj.6590>
- Maina, J., De Moel, H., Zinke, J., Madin, J., McClanahan, T., & Vermaat, J. E. (2013). Human deforestation outweighs future climate change impacts of sedimentation on coral reefs. *Nature Communications*, 4(May), 1–7. <https://doi.org/10.1038/ncomms2986>
- McCook, L. J. (1999). Macroalgae, nutrients and phase shifts on coral reefs: Scientific issues and management consequences for the Great Barrier Reef. *Coral Reefs*,

- 18(4), 357–367. <https://doi.org/10.1007/s003380050213>
- Meng, P.-J., Lee, H.-J., Wang, J.-T., Chen, C.-C., Lin, H.-J., Tew, K. S., & Hsieh, W.-J. (2008). A long-term survey on anthropogenic impacts to the water quality of coral reefs, southern Taiwan. *Environmental Pollution*, 156(1), 67–75. <https://doi.org/10.1016/j.envpol.2007.12.039>
- Miñarro, S., Navarrete Forero, G., Reuter, H., & van Putten, I. E. (2016). The role of patron-client relations on the fishing behaviour of artisanal fishermen in the Spermonde Archipelago (Indonesia). *Marine Policy*, 69, 73–83. <https://doi.org/10.1016/j.marpol.2016.04.006>
- Moore, A. M., Ambo-Rappe, R., & Ali, Y. (2017). “The Lost Princess (putri duyung)” of the Small Islands: Dugongs around Sulawesi in the Anthropocene. *Frontiers in Marine Science*, 4(SEP). <https://doi.org/10.3389/fmars.2017.00284>
- Nasir, A. (2016). The Use of C/N Ratio in Assessing the Influence of Land-Based Material in Coastal Water of South Sulawesi and Spermonde Archipelago, Indonesia. *Frontiers in Marine Science*, 3(DEC), 1–8. <https://doi.org/10.3389/fmars.2016.00266>
- Navarrete Forero, G., Miñarro, S., Mildenerger, T. K., Breckwoldt, A., Sudirman, & Reuter, H. (2017). Participatory Boat Tracking Reveals Spatial Fishing Patterns in an Indonesian Artisanal Fishery. *Frontiers in Marine Science*, 4(DEC), 1–13. <https://doi.org/10.3389/fmars.2017.00409>
- Nurdin, N., Komatsu, T., Rani, C., Supriadi, Fakhriyyah, S., & Agus. (2016). Coral reef destruction of Small island in 44 years and destructive fishing in Spermonde Archipelago, Indonesia. *IOP Conference Series: Earth and Environmental Science*, 47(1), 012011. <https://doi.org/10.1088/1755-1315/47/1/012011>
- Pernice, M., Raina, J. B., Rädcker, N., Cárdenas, A., Pogoreutz, C., & Voolstra, C. R. (2020). Down to the bone: the role of overlooked endolithic microbiomes in reef coral health. *ISME Journal*, 14(2), 325–334. <https://doi.org/10.1038/s41396-019-0548-z>
- Plass-Johnson, J. G., Ferse, S. C. A., Jompa, J., Wild, C., & Teichberg, M. (2015). Fish herbivory as key ecological function in a heavily degraded coral reef system. *Limnology and Oceanography*, 60(4), 1382–1391. <https://doi.org/10.1002/lno.10105>
- Plass-Johnson, J. G., Heiden, J. P., Abu, N., Lukman, M., & Teichberg, M. (2016). Experimental analysis of the effects of consumer exclusion on recruitment and succession of a coral reef system along a water quality gradient in the Spermonde Archipelago, Indonesia. *Coral Reefs*, 35(1), 229–243. <https://doi.org/10.1007/s00338-015-1369-9>

- Plass-Johnson, J. G., Teichberg, M., Bednarz, V. N., Gärdes, A., Heiden, J. P., Lukman, M., Miñarro, S., Kegler, H., Weiland, L., Wild, C., Reuter, H., & Ferse, S. C. A. (2018). Spatio-temporal patterns in the coral reef communities of the Spermonde Archipelago, 2012-2014, II: Fish assemblages display structured variation related to benthic condition. *Frontiers in Marine Science*, 5(FEB), 1–15. <https://doi.org/10.3389/fmars.2018.00036>
- Pörtner, H. O., & Farrell, A. P. (2008). Ecology: Physiology and climate change. *Science*, 322(5902), 690–692. <https://doi.org/10.1126/science.1163156>
- Preskitt, L. B., Vroom, P. S., & Smith, C. M. (2004). A Rapid Ecological Assessment (REA) Quantitative Survey Method for Benthic Algae Using Photoquadrats with Scuba. *Pacific Science*, 58(2), 201–209. <https://doi.org/10.1353/psc.2004.0021>
- Purnama Sari, N. W., Siringoringo, R. M., Abrar, M., Putra, R. D., Sutiadi, R., & Yusuf, S. (2021). Status of Coral Reefs in the Water of Spermonde, Makassar, South Sulawesi. *E3S Web of Conferences*, 324(May 2018), 03007. <https://doi.org/10.1051/e3sconf/202132403007>
- Reuter, H., Breckwoldt, A., Dohna, T., Ferse, S., Gärdes, A., Glaser, M., Huyghe, F., Kegler, H., Knittweis, L., Kochzius, M., Kraemer, W. E., Leins, J., Lukman, M., Madduppa, H., Nuryanto, A., Hui, M., Miñarro, S., Forero, G. N., Paragay, S. H., ... Jompa, J. (2022). Coral reef social–ecological systems under pressure in Southern Sulawesi. In *Science for the Protection of Indonesian Coastal Ecosystems (SPICE)* (pp. 143–199). Elsevier. <https://doi.org/10.1016/B978-0-12-815050-4.00005-5>
- Rinkevich, B. (2021). Ecological engineering approaches in coral reef restoration. *ICES Journal of Marine Science*, 78(1), 410–420. <https://doi.org/10.1093/icesjms/fsaa022>
- Rosenberg, G., & Ramus, J. (1984). Uptake of inorganic nitrogen and seaweed surface area: Volume ratios. *Aquatic Botany*, 19(1–2), 65–72. [https://doi.org/10.1016/0304-3770\(84\)90008-1](https://doi.org/10.1016/0304-3770(84)90008-1)
- Rukminasari, N., Suharto, Yanuarita, D., Jompa, J., & Fajriati Inaku, D. (2020). Reef fishes abundance and assemblages in six islands (Kapoposang, Lanyukang, Lumu-Lumu, Badi, Ballang Lompo and Karanrang island) of spermonde archipelago during El Nino 2016, South Sulawesi, Indonesia. *IOP Conference Series: Earth and Environmental Science*, 564(1), 012012. <https://doi.org/10.1088/1755-1315/564/1/012012>
- Sawall, Y., Teichberg, M. C., Seemann, J., Litaay, M., Jompa, J., & Richter, C. (2011). Nutritional status and metabolism of the coral *Stylophora subseriata* along a eutrophication gradient in Spermonde Archipelago (Indonesia). *Coral Reefs*, 30(3), 841–853. <https://doi.org/10.1007/s00338-011-0764-0>
- Schuhmacher, H., & Zibrowius, H. (1985). What is hermatypic? *Coral Reefs*, 4(1), 1–9.

- <https://doi.org/10.1007/BF00302198>
- Sommer, B., Harrison, P. L., & Scheffers, S. R. (2010). Aggressive colonial ascidian impacting deep coral reefs at Bonaire, Netherlands Antilles. *Coral Reefs*, 29(1), 245–245. <https://doi.org/10.1007/s00338-009-0579-4>
- Sprintall, J., & Révelard, A. (2014). The Indonesian Throughflow response to Indo-Pacific climate variability. *Journal of Geophysical Research: Oceans*, 119(2), 1161–1175. <https://doi.org/10.1002/2013JC009533>
- Statistics of Makassar. (2021). *Kota Makassar Dalam Angka*.
- Suharsono. (2008). *Jenis-Jenis Karang Indonesia*.
- Swierts, T., & Vermeij, M. J. A. (2016). Competitive interactions between corals and turf algae depend on coral colony form. *PeerJ*, 4(5), e1984. <https://doi.org/10.7717/peerj.1984>
- Tebbett, S. B., & Bellwood, D. R. (2019). Algal turf sediments on coral reefs: what's known and what's next. *Marine Pollution Bulletin*, 149(August), 110542. <https://doi.org/10.1016/j.marpolbul.2019.110542>
- Tebbett, S. B., Streit, R. P., & Bellwood, D. R. (2020). A 3D perspective on sediment accumulation in algal turfs: Implications of coral reef flattening. *Journal of Ecology*, 108(1), 70–80. <https://doi.org/10.1111/1365-2745.13235>
- Thamrin. (2017). *Karang dan Zooxanthellae* (Cetakan Pe). Badan Penerbit Universitas Riau. <https://repository.unri.ac.id/handle/123456789/9823>
- Timm, J., Kochzius, M., Madduppa, H. H., Neuhaus, A. I., & Dohna, T. (2017). Small scale genetic population structure of coral reef organisms in Spermonde Archipelago, Indonesia. *Frontiers in Marine Science*, 4(SEP). <https://doi.org/10.3389/fmars.2017.00294>
- Tresnati, J., Yanti, A., Rukminasari, N., Irmawati, Suwarni, Yasir, I., Rahmani, P. Y., Aprianto, R., & Tuwo, A. (2020). Sex ratio, maturity stage and fist maturity of yellowfin parrotfish *Scares flavipectoralis* Schultz, 1958 in Wallace line at Spermonde Archipelago, South Sulawesi. *IOP Conference Series: Earth and Environmental Science*, 564(1), 012003. <https://doi.org/10.1088/1755-1315/564/1/012003>
- Triyulianti, I., Setiawan, A., Hamzah, F., Agustiadi, T., Priyono, B., Trenggono, M., & Nagari, F. (2023). Distributions of Nutrients in Relation to Phytoplankton Community Heterogeneity in the Makassar Strait, Indonesia. *IOP Conference Series: Earth and Environmental Science*, 1163(1), 012011. <https://doi.org/10.1088/1755-1315/1163/1/012011>
- Vermeij, M. J. A., van Moorselaar, I., Engelhard, S., Hörnlein, C., Vonk, S. M., & Visser, P. M. (2010). The Effects of Nutrient Enrichment and Herbivore Abundance on the

- Ability of Turf Algae to Overgrow Coral in the Caribbean. *PLoS ONE*, 5(12), e14312. <https://doi.org/10.1371/journal.pone.0014312>
- Veron, J., & Smith, S. (2000). *Corals of the World* (Vol.1). Australian Institute of Marine Science. <https://books.google.co.id/books?id=A4sWAQAIAAJ>
- Wagner, D., Friedlander, A. M., Pyle, R. L., Brooks, C. M., Gjerde, K. M., & Wilhelm, T. 'Aulani. (2020). Coral Reefs of the High Seas: Hidden Biodiversity Hotspots in Need of Protection. *Frontiers in Marine Science*, 7(September), 1–13. <https://doi.org/10.3389/fmars.2020.567428>
- Wild, C., Jantzen, C., & Kremb, S. G. (2014). Turf algae-mediated coral damage in coastal reefs of Belize, Central America. *PeerJ*, 2(1), e571. <https://doi.org/10.7717/peerj.571>
- YUSUF, S., BEGER, M., Tassakka, A. C. M. A. R., DE BRAUWER, M., PRICELLA, A., RAHMI, R., UMAR, W., LIMMON, G. V., MOORE, A. M., & Jompa, J. (2021). Cross shelf gradients of scleractinian corals in the Spermonde Islands, South Sulawesi, Indonesia. *Biodiversitas Journal of Biological Diversity*, 22(3), 1415–1423. <https://doi.org/10.13057/biodiv/d220344>
- Zaneveld, J. R., Burkepile, D. E., Shantz, A. A., Pritchard, C. E., McMinds, R., Payet, J. P., Welsh, R., Correa, A. M. S., Lemoine, N. P., Rosales, S., Fuchs, C., Maynard, J. A., & Thurber, R. V. (2016). Overfishing and nutrient pollution interact with temperature to disrupt coral reefs down to microbial scales. *Nature Communications*, 7(1), 11833. <https://doi.org/10.1038/ncomms11833>

LAMPIRAN

A. Hasil Anova

1. Tutupan bentik

```
              Df Sum Sq Mean Sq F value Pr(>F)
Category.Benthic  1  4594    4594  62.02 5.5e-09 ***
SiteID           7   270     39    0.52  0.81
Category.Benthic:SiteID 7  9181    1312  17.70 2.3e-09 ***
Residuals       32  2371     74
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

The ANOVA (formula: `per.cover ~ Category.Benthic * SiteID`) suggests that:

- The main effect of `Category.Benthic` is statistically significant and large ($F(1, 32) = 62.02$, $p < .001$; Eta^2 (partial) = 0.66, 95% CI [0.49, 1.00])
- The main effect of `SiteID` is statistically not significant and medium ($F(7, 32) = 0.52$, $p = 0.812$; Eta^2 (partial) = 0.10, 95% CI [0.00, 1.00])
- The interaction between `Category.Benthic` and `SiteID` is statistically significant and large ($F(7, 32) = 17.70$, $p < .001$; Eta^2 (partial) = 0.79, 95% CI [0.66, 1.00])

Effect sizes were labelled following Field's (2013) recommendations.

2. Interaksi karang dan turf alga

```
              Df Sum Sq Mean Sq F value Pr(>F)
Category       3 20939    6980 275.48 < 2e-16 ***
Site_ID       7   988     141  5.57 4.9e-05 ***
Category:Site_ID 21 13182     628  24.77 < 2e-16 ***
Residuals     64  1622     25
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

The ANOVA (formula: `per.cover ~ Category * Site_ID`) suggests that:

- The main effect of `Category` is statistically significant and large ($F(3, 64) = 275.48$, $p < .001$; Eta^2 (partial) = 0.93, 95% CI [0.90, 1.00])
- The main effect of `Site_ID` is statistically significant and large ($F(7, 64) = 5.57$, $p < .001$; Eta^2 (partial) = 0.38, 95% CI [0.18, 1.00])
- The interaction between `Category` and `Site_ID` is statistically significant and large ($F(21, 64) = 24.77$, $p < .001$; Eta^2 (partial) = 0.89, 95% CI [0.84, 1.00])

Effect sizes were labelled following Field's (2013) recommendations.

3. Interaksi karang dan alga

```

              Df Sum Sq Mean Sq F value Pr(>F)
Category      2  1015     507   64.03 2.8e-14 ***
Site_ID       7   105      15    1.89  0.0922 .
Category:Site_ID 14   388      28    3.50  0.0006 ***
Residuals    48   380       8
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
> report(aov.CA.site)
The ANOVA (formula: per.cover ~ Category * Site_ID) suggests that:

```

The ANOVA (formula: per.cover ~ Category * Site_ID) suggests that:

- The main effect of Category is statistically significant and large (F(2, 48) = 64.03, $p < .001$; Eta2 (partial) = 0.73, 95% CI [0.61, 1.00])
- The main effect of Site_ID is statistically not significant and large (F(7, 48) = 1.89, $p = 0.092$; Eta2 (partial) = 0.22, 95% CI [0.00, 1.00])
- The interaction between Category and Site_ID is statistically significant and large (F(14, 48) = 3.50, $p < .001$; Eta2 (partial) = 0.50, 95% CI [0.21, 1.00])

Effect sizes were labelled following Field's (2013) recommendations.

B. Tutupan Bentik

Tabel 2. Persentase tutupan bentik

No	Year	SiteID	Dist.to.Makassar_km	Category.Benthic	av.cover	se.cover
1	2021	LL	1	Hard.coral	1.89	0.51
2	2021	LL	1	TA	57.98	5.40
3	2021	SA	7	Hard.coral	11.91	2.89
4	2021	SA	7	TA	40.56	12.93
5	2021	BL	11	Hard.coral	16.44	2.47
6	2021	BL	11	TA	42.76	7.35
7	2021	BO	14	Hard.coral	14.42	4.73
8	2021	BO	14	TA	55.56	3.45
9	2021	BA	19	Hard.coral	35.31	3.37
10	2021	BA	19	TA	31.71	5.86
11	2021	LU	22	Hard.coral	45.33	2.33
12	2021	LU	22	TA	17.20	3.78
13	2021	KS	27	Hard.coral	40.51	6.96
14	2021	KS	27	TA	26.36	3.46
15	2021	KP	55	Hard.coral	24.20	2.77
16	2021	KP	55	TA	48.04	4.82
17	2022	LL	1	Hard.coral	0.51	0.23
18	2022	LL	1	TA	58.73	6.80
19	2022	SA	7	Hard.coral	13.64	6.55
20	2022	SA	7	TA	55.47	6.90
21	2022	BL	11	Hard.coral	19.89	6.02
22	2022	BL	11	TA	45.44	5.06
23	2022	BO	14	Hard.coral	10.53	2.07
24	2022	BO	14	TA	60.69	3.29

25	2022	BA	19	Hard.coral	30.93	2.90
26	2022	BA	19	TA	31.53	4.37
27	2022	LU	22	Hard.coral	42.47	4.74
28	2022	LU	22	TA	26.31	8.86
29	2022	KS	27	Hard.coral	39.84	1.28
30	2022	KS	27	TA	20.58	3.16
31	2022	KP	55	Hard.coral	28.60	5.19
32	2022	KP	55	TA	44.20	3.78

C. Frekuensi Interaksi

Tabel 3. Frekuensi interaksi

No	Year	Site_ID	Transect_number	Major_category	av.MCfreq
1	2021	BL	1	Coral	3.0
2	2021	BL	1	Algae	2.0
3	2021	BL	1	TA	7.4
4	2021	BL	1	No contact	2.3
5	2021	BL	1	Others	3.8
6	2021	BL	1	Unknown/Shadow	1.0
7	2021	BL	2	Coral	5.0
8	2021	BL	2	TA	11.8
9	2021	BL	2	No contact	3.0
10	2021	BL	2	Others	2.3
11	2021	BL	2	Unknown/Shadow	2.0
12	2021	BL	3	Coral	2.8
13	2021	BL	3	TA	18.2
14	2021	BL	3	No contact	3.3
15	2021	BL	3	Others	3.7
16	2021	BL	3	Unknown/Shadow	1.0
17	2021	BO	1	Coral	4.8
18	2021	BO	1	TA	10.7
19	2021	BO	1	No contact	2.8
20	2021	BO	1	Others	4.7
21	2021	BO	2	Coral	2.8
22	2021	BO	2	Algae	1.3
23	2021	BO	2	TA	5.0
24	2021	BO	2	No contact	2.3
25	2021	BO	2	Others	6.0
26	2021	BO	2	Unknown/Shadow	1.0
27	2021	BO	3	Coral	2.8
28	2021	BO	3	Algae	2.0
29	2021	BO	3	TA	10.3
30	2021	BO	3	No contact	3.2
31	2021	BO	3	Others	4.6
32	2021	BA	1	Coral	4.5

33	2021	BA	1	Algae	3.3
34	2021	BA	1	TA	13.6
35	2021	BA	1	No contact	4.8
36	2021	BA	1	Others	2.5
37	2021	BA	2	Coral	4.6
38	2021	BA	2	TA	14.0
39	2021	BA	2	No contact	2.8
40	2021	BA	2	Others	2.2
41	2021	BA	3	Coral	4.6
42	2021	BA	3	TA	11.2
43	2021	BA	3	No contact	2.8
44	2021	BA	3	Others	3.5
45	2021	BA	3	Unknown/Shadow	1.5
46	2021	LU	1	Coral	6.0
47	2021	LU	1	Algae	1.5
48	2021	LU	1	TA	9.7
49	2021	LU	1	No contact	2.8
50	2021	LU	1	Others	2.8
51	2021	LU	1	Unknown/Shadow	1.0
52	2021	LU	2	Coral	3.0
53	2021	LU	2	Algae	2.0
54	2021	LU	2	TA	5.8
55	2021	LU	2	No contact	4.6
56	2021	LU	2	Others	3.7
57	2021	LU	2	Unknown/Shadow	2.0
58	2021	LU	3	Coral	1.8
59	2021	LU	3	Algae	2.0
60	2021	LU	3	TA	11.0
61	2021	LU	3	No contact	4.4
62	2021	LU	3	Others	3.8
63	2021	LU	3	Unknown/Shadow	2.0
64	2021	KS	1	Coral	6.0
65	2021	KS	1	TA	14.3
66	2021	KS	1	No contact	7.0
67	2021	KS	1	Others	4.3
68	2021	KS	1	Unknown/Shadow	2.3
69	2021	KS	2	Coral	5.0
70	2021	KS	2	TA	13.2
71	2021	KS	2	No contact	2.2
72	2021	KS	2	Others	3.8
73	2021	KS	3	Coral	5.0
74	2021	KS	3	TA	8.5
75	2021	KS	3	No contact	4.8

76	2021	KS	3	Others	6.7
77	2021	KS	3	Unknown/Shadow	1.0
78	2021	KP	1	Coral	1.0
79	2021	KP	1	TA	5.3
80	2021	KP	1	No contact	4.0
81	2021	KP	1	Others	2.5
82	2021	KP	2	Coral	1.3
83	2021	KP	2	Algae	1.0
84	2021	KP	2	TA	7.2
85	2021	KP	2	No contact	5.2
86	2021	KP	2	Others	8.5
87	2021	KP	2	Unknown/Shadow	2.0
88	2021	KP	3	Coral	1.0
89	2021	KP	3	Algae	3.0
90	2021	KP	3	TA	6.8
91	2021	KP	3	No contact	2.4
92	2021	KP	3	Others	3.0
93	2022	LL	1	Coral	1.3
94	2022	LL	1	Algae	1.3
95	2022	LL	1	TA	6.4
96	2022	LL	1	No contact	1.3
97	2022	LL	1	Others	2.0
98	2022	LL	2	Coral	3.0
99	2022	LL	2	Algae	2.0
100	2022	LL	2	TA	11.2
101	2022	LL	2	No contact	1.5
102	2022	LL	2	Others	1.7
103	2022	LL	3	Coral	2.5
104	2022	LL	3	Algae	1.0
105	2022	LL	3	TA	8.8
106	2022	LL	3	No contact	1.0
107	2022	SA	1	Coral	3.7
108	2022	SA	1	Algae	1.3
109	2022	SA	1	TA	12.4
110	2022	SA	1	No contact	2.3
111	2022	SA	1	Others	3.7
112	2022	SA	2	Coral	6.2
113	2022	SA	2	TA	19.0
114	2022	SA	2	No contact	2.8
115	2022	SA	2	Others	4.4
116	2022	SA	3	Coral	4.0
117	2022	SA	3	Algae	3.0
118	2022	SA	3	TA	11.0
119	2022	SA	3	No contact	2.8
120	2022	SA	3	Others	1.0

121	2022	BL	1	Coral	2.3
122	2022	BL	1	Algae	2.0
123	2022	BL	1	TA	9.8
124	2022	BL	1	No contact	2.0
125	2022	BL	1	Others	2.0
126	2022	BL	2	Coral	2.5
127	2022	BL	2	Algae	4.0
128	2022	BL	2	TA	8.2
129	2022	BL	2	No contact	2.0
130	2022	BL	2	Others	5.7
131	2022	BL	3	Coral	1.0
132	2022	BL	3	Algae	1.5
133	2022	BL	3	TA	6.8
134	2022	BL	3	No contact	1.7
135	2022	BL	3	Others	2.5
136	2022	BO	1	Coral	2.3
137	2022	BO	1	TA	4.0
138	2022	BO	1	No contact	1.3
139	2022	BO	1	Others	4.0
140	2022	BO	2	Coral	1.5
141	2022	BO	2	Algae	2.0
142	2022	BO	2	TA	5.4
143	2022	BO	2	No contact	1.8
144	2022	BO	2	Others	1.8
145	2022	BO	3	Coral	1.5
146	2022	BO	3	TA	5.2
147	2022	BO	3	No contact	1.5
148	2022	BO	3	Others	3.3
149	2022	BA	1	Coral	3.5
150	2022	BA	1	TA	11.3
151	2022	BA	1	No contact	1.5
152	2022	BA	1	Others	6.3
153	2022	BA	1	Unknown/Shadow	1.0
154	2022	BA	2	Coral	1.3
155	2022	BA	2	Algae	4.0
156	2022	BA	2	TA	7.5
157	2022	BA	2	No contact	1.0
158	2022	BA	2	Others	1.8
159	2022	BA	3	Coral	1.8
160	2022	BA	3	TA	10.6
161	2022	BA	3	No contact	4.0
162	2022	BA	3	Others	2.7
163	2022	LU	1	Coral	3.3

164	2022	LU	1	TA	4.6
165	2022	LU	1	No contact	2.7
166	2022	LU	1	Others	4.0
167	2022	LU	1	Unknown/Shadow	1.0
168	2022	LU	2	Coral	3.7
169	2022	LU	2	TA	6.6
170	2022	LU	2	No contact	2.3
171	2022	LU	2	Others	1.3
172	2022	LU	3	Coral	2.8
173	2022	LU	3	Algae	2.0
174	2022	LU	3	TA	7.6
175	2022	LU	3	No contact	2.0
176	2022	LU	3	Others	2.0
177	2022	LU	3	Unknown/Shadow	1.0
178	2022	KS	1	Coral	2.0
179	2022	KS	1	Algae	1.5
180	2022	KS	1	TA	4.5
181	2022	KS	1	No contact	2.0
182	2022	KS	1	Others	2.5
183	2022	KS	2	Coral	2.7
184	2022	KS	2	Algae	3.0
185	2022	KS	2	TA	2.2
186	2022	KS	2	No contact	1.8
187	2022	KS	2	Others	3.5
188	2022	KS	3	Coral	2.0
189	2022	KS	3	Algae	4.0
190	2022	KS	3	TA	3.0
191	2022	KS	3	No contact	2.0
192	2022	KS	3	Others	3.0
193	2022	KP	1	Coral	1.3
194	2022	KP	1	Algae	1.0
195	2022	KP	1	TA	3.6
196	2022	KP	1	No contact	1.5
197	2022	KP	1	Others	5.0
198	2022	KP	2	Coral	3.3
199	2022	KP	2	Algae	1.5
200	2022	KP	2	TA	4.5
201	2022	KP	2	No contact	1.3
202	2022	KP	2	Others	3.8
203	2022	KP	3	Coral	2.3
204	2022	KP	3	TA	7.4
205	2022	KP	3	No contact	1.8
206	2022	KP	3	Others	2.3

D. Komposisi Interaksi Major Category

Tabel 4. Komposisi interaksi major category karang dan turf alga

No	Year	Site_ID	Transect_number	Category	per.cover
19	2022	LL	1	Algae	8.72
20	2022	LL	2	Algae	4.77
21	2022	LL	3	Algae	3.87
22	2022	SA	1	Algae	5.03
23	2022	SA	2	Algae	0.00
24	2022	SA	3	Algae	7.28
25	2022	BL	1	Algae	1.76
26	2022	BL	2	Algae	5.20
27	2022	BL	3	Algae	4.95
28	2022	BO	1	Algae	0.00
29	2022	BO	2	Algae	4.69
30	2022	BO	3	Algae	0.00
31	2022	BA	1	Algae	0.00
32	2022	BA	2	Algae	5.73
33	2022	BA	3	Algae	0.00
34	2022	LU	1	Algae	0.00
35	2022	LU	2	Algae	0.00
36	2022	LU	3	Algae	2.95
37	2022	KS	1	Algae	9.52
38	2022	KS	2	Algae	7.72
39	2022	KS	3	Algae	10.62
40	2022	KP	1	Algae	0.25
41	2022	KP	2	Algae	3.00
42	2022	KP	3	Algae	0.00
61	2022	LL	1	Hard corals	4.26
62	2022	LL	2	Hard corals	4.75
63	2022	LL	3	Hard corals	9.63
64	2022	SA	1	Hard corals	5.81
65	2022	SA	2	Hard corals	9.41
66	2022	SA	3	Hard corals	10.77
67	2022	BL	1	Hard corals	8.43
68	2022	BL	2	Hard corals	4.97
69	2022	BL	3	Hard corals	6.31
70	2022	BO	1	Hard corals	12.78
71	2022	BO	2	Hard corals	2.91
72	2022	BO	3	Hard corals	5.93
73	2022	BA	1	Hard corals	10.39
74	2022	BA	2	Hard corals	6.17
75	2022	BA	3	Hard corals	5.27
76	2022	LU	1	Hard corals	18.19
77	2022	LU	2	Hard corals	23.85

78	2022	LU	3	Hard corals	13.68
79	2022	KS	1	Hard corals	3.28
80	2022	KS	2	Hard corals	13.27
81	2022	KS	3	Hard corals	8.47
82	2022	KP	1	Hard corals	17.36
83	2022	KP	2	Hard corals	6.43
84	2022	KP	3	Hard corals	8.81
103	2022	LL	1	No contact	9.60
104	2022	LL	2	No contact	1.78
105	2022	LL	3	No contact	0.93
106	2022	SA	1	No contact	4.26
107	2022	SA	2	No contact	5.52
108	2022	SA	3	No contact	14.35
109	2022	BL	1	No contact	4.56
110	2022	BL	2	No contact	7.27
111	2022	BL	3	No contact	6.79
112	2022	BO	1	No contact	11.43
113	2022	BO	2	No contact	40.57
114	2022	BO	3	No contact	13.11
115	2022	BA	1	No contact	4.30
116	2022	BA	2	No contact	2.27
117	2022	BA	3	No contact	10.18
118	2022	LU	1	No contact	21.07
119	2022	LU	2	No contact	23.41
120	2022	LU	3	No contact	8.17
121	2022	KS	1	No contact	37.39
122	2022	KS	2	No contact	31.05
123	2022	KS	3	No contact	12.36
124	2022	KP	1	No contact	14.10
125	2022	KP	2	No contact	21.56
126	2022	KP	3	No contact	34.90
145	2022	LL	1	Other	5.93
146	2022	LL	2	Other	9.87
147	2022	LL	3	Other	0.00
148	2022	SA	1	Other	24.57
149	2022	SA	2	Other	17.56
150	2022	SA	3	Other	3.37
151	2022	BL	1	Other	11.07
152	2022	BL	2	Other	19.27
153	2022	BL	3	Other	7.00
154	2022	BO	1	Other	25.61
155	2022	BO	2	Other	9.66
156	2022	BO	3	Other	30.21

157	2022	BA	1	Other	24.25
158	2022	BA	2	Other	17.64
159	2022	BA	3	Other	5.25
160	2022	LU	1	Other	20.07
161	2022	LU	2	Other	9.38
162	2022	LU	3	Other	15.16
163	2022	KS	1	Other	12.62
164	2022	KS	2	Other	15.94
165	2022	KS	3	Other	28.31
166	2022	KP	1	Other	17.87
167	2022	KP	2	Other	30.04
168	2022	KP	3	Other	10.83
187	2022	LL	1	Turf algae	71.49
188	2022	LL	2	Turf algae	78.84
189	2022	LL	3	Turf algae	85.58
190	2022	SA	1	Turf algae	60.33
191	2022	SA	2	Turf algae	67.51
192	2022	SA	3	Turf algae	64.23
193	2022	BL	1	Turf algae	74.18
194	2022	BL	2	Turf algae	63.29
195	2022	BL	3	Turf algae	74.96
196	2022	BO	1	Turf algae	50.18
197	2022	BO	2	Turf algae	42.17
198	2022	BO	3	Turf algae	50.75
199	2022	BA	1	Turf algae	61.06
200	2022	BA	2	Turf algae	68.19
201	2022	BA	3	Turf algae	79.30
202	2022	LU	1	Turf algae	40.66
203	2022	LU	2	Turf algae	43.36
204	2022	LU	3	Turf algae	60.04
205	2022	KS	1	Turf algae	37.19
206	2022	KS	2	Turf algae	32.01
207	2022	KS	3	Turf algae	40.24
208	2022	KP	1	Turf algae	50.43
209	2022	KP	2	Turf algae	38.98
210	2022	KP	3	Turf algae	45.46

E. Karang – Turf alga

Tabel 5. Persentase interaksi karang dan turf alga

No	Year	Site_ID	Transect_number	Category	per.cover
1	2022	LL	1	Coral	4.26
2	2022	LL	2	Coral	4.75
3	2022	LL	3	Coral	9.63

4	2022	SA	1	Coral	5.81
5	2022	SA	2	Coral	9.41
6	2022	SA	3	Coral	10.77
7	2022	BL	1	Coral	8.43
8	2022	BL	2	Coral	4.97
9	2022	BL	3	Coral	6.31
10	2022	BO	1	Coral	12.78
11	2022	BO	2	Coral	2.91
12	2022	BO	3	Coral	5.93
13	2022	BA	1	Coral	10.39
14	2022	BA	2	Coral	6.17
15	2022	BA	3	Coral	5.27
16	2022	LU	1	Coral	18.19
17	2022	LU	2	Coral	23.85
18	2022	LU	3	Coral	13.68
19	2022	KS	1	Coral	3.28
20	2022	KS	2	Coral	13.27
21	2022	KS	3	Coral	8.47
22	2022	KP	1	Coral	17.36
23	2022	KP	2	Coral	6.43
24	2022	KP	3	Coral	8.81
25	2022	LL	1	Turf.sediment.plus	66.39
26	2022	LL	2	Turf.sediment.plus	72.78
27	2022	LL	3	Turf.sediment.plus	73.54
28	2022	SA	1	Turf.sediment.plus	45.98
29	2022	SA	2	Turf.sediment.plus	57.74
30	2022	SA	3	Turf.sediment.plus	53.33
31	2022	BL	1	Turf.sediment.plus	59.44
32	2022	BL	2	Turf.sediment.plus	54.80
33	2022	BL	3	Turf.sediment.plus	72.26
34	2022	BO	1	Turf.sediment.plus	41.75
35	2022	BO	2	Turf.sediment.plus	26.20
36	2022	BO	3	Turf.sediment.plus	35.87
37	2022	BA	1	Turf.sediment.plus	46.37
38	2022	BA	2	Turf.sediment.plus	60.52
39	2022	BA	3	Turf.sediment.plus	74.19
40	2022	LU	1	Turf.sediment.plus	6.52
41	2022	LU	2	Turf.sediment.plus	10.98
42	2022	LU	3	Turf.sediment.plus	20.27
43	2022	KS	1	Turf.sediment.plus	21.89
44	2022	KS	2	Turf.sediment.plus	10.14
45	2022	KS	3	Turf.sediment.plus	26.38
46	2022	KP	1	Turf.sediment.plus	19.08

47	2022	KP	2	Turf.sediment.plus	14.91
48	2022	KP	3	Turf.sediment.plus	11.06
49	2022	LL	1	Turf.sediment.minus	4.69
50	2022	LL	2	Turf.sediment.minus	3.76
51	2022	LL	3	Turf.sediment.minus	9.50
52	2022	SA	1	Turf.sediment.minus	11.71
53	2022	SA	2	Turf.sediment.minus	9.36
54	2022	SA	3	Turf.sediment.minus	9.55
55	2022	BL	1	Turf.sediment.minus	9.75
56	2022	BL	2	Turf.sediment.minus	3.76
57	2022	BL	3	Turf.sediment.minus	1.45
58	2022	BO	1	Turf.sediment.minus	8.00
59	2022	BO	2	Turf.sediment.minus	14.94
60	2022	BO	3	Turf.sediment.minus	14.88
61	2022	BA	1	Turf.sediment.minus	13.97
62	2022	BA	2	Turf.sediment.minus	7.31
63	2022	BA	3	Turf.sediment.minus	4.35
64	2022	LU	1	Turf.sediment.minus	34.14
65	2022	LU	2	Turf.sediment.minus	32.39
66	2022	LU	3	Turf.sediment.minus	34.56
67	2022	KS	1	Turf.sediment.minus	14.05
68	2022	KS	2	Turf.sediment.minus	21.87
69	2022	KS	3	Turf.sediment.minus	10.29
70	2022	KP	1	Turf.sediment.minus	31.34
71	2022	KP	2	Turf.sediment.minus	22.79
72	2022	KP	3	Turf.sediment.minus	29.68
73	2022	LL	1	Neutral.turf	0.41
74	2022	LL	2	Neutral.turf	2.29
75	2022	LL	3	Neutral.turf	2.55
76	2022	SA	1	Neutral.turf	2.65
77	2022	SA	2	Neutral.turf	0.41
78	2022	SA	3	Neutral.turf	1.35
79	2022	BL	1	Neutral.turf	4.99
80	2022	BL	2	Neutral.turf	4.73
81	2022	BL	3	Neutral.turf	1.26
82	2022	BO	1	Neutral.turf	0.43
83	2022	BO	2	Neutral.turf	1.03
84	2022	BO	3	Neutral.turf	0.00
85	2022	BA	1	Neutral.turf	0.71
86	2022	BA	2	Neutral.turf	0.36
87	2022	BA	3	Neutral.turf	0.75
88	2022	LU	1	Neutral.turf	0.00
89	2022	LU	2	Neutral.turf	0.00
90	2022	LU	3	Neutral.turf	5.22
91	2022	KS	1	Neutral.turf	1.25

92	2022	KS	2	Neutral.turf	0.00
93	2022	KS	3	Neutral.turf	3.57
94	2022	KP	1	Neutral.turf	0.00
95	2022	KP	2	Neutral.turf	1.28
96	2022	KP	3	Neutral.turf	4.73

F. Karang – Alga

Tabel 6. Interaksi karang dan alga

No	Year	Site_ID	Transect_number	Category	per.cover
1	2022	LL	1	Coral	4.26
2	2022	LL	2	Coral	4.75
3	2022	LL	3	Coral	9.63
4	2022	SA	1	Coral	5.81
5	2022	SA	2	Coral	9.41
6	2022	SA	3	Coral	10.77
7	2022	BL	1	Coral	8.43
8	2022	BL	2	Coral	4.97
9	2022	BL	3	Coral	6.31
10	2022	BO	1	Coral	12.78
11	2022	BO	2	Coral	2.91
12	2022	BO	3	Coral	5.93
13	2022	BA	1	Coral	10.39
14	2022	BA	2	Coral	6.17
15	2022	BA	3	Coral	5.27
16	2022	LU	1	Coral	18.19
17	2022	LU	2	Coral	23.85
18	2022	LU	3	Coral	13.68
19	2022	KS	1	Coral	3.28
20	2022	KS	2	Coral	13.27
21	2022	KS	3	Coral	8.47
22	2022	KP	1	Coral	17.36
23	2022	KP	2	Coral	6.43
24	2022	KP	3	Coral	8.81
25	2022	LL	1	Algae	8.72
26	2022	LL	2	Algae	4.77
27	2022	LL	3	Algae	3.87
28	2022	SA	1	Algae	5.03
29	2022	SA	2	Algae	0.00
30	2022	SA	3	Algae	7.28
31	2022	BL	1	Algae	1.76
32	2022	BL	2	Algae	5.20
33	2022	BL	3	Algae	4.95
34	2022	BO	1	Algae	0.00
35	2022	BO	2	Algae	4.69

36	2022	BO	3	Algae	0.00
37	2022	BA	1	Algae	0.00
38	2022	BA	2	Algae	5.73
39	2022	BA	3	Algae	0.00
40	2022	LU	1	Algae	0.00
41	2022	LU	2	Algae	0.00
42	2022	LU	3	Algae	2.95
43	2022	KS	1	Algae	9.52
44	2022	KS	2	Algae	5.71
45	2022	KS	3	Algae	9.84
46	2022	KP	1	Algae	0.00
47	2022	KP	2	Algae	3.00
48	2022	KP	3	Algae	0.00
49	2022	LL	1	Neutral.algae	0.00
50	2022	LL	2	Neutral.algae	0.00
51	2022	LL	3	Neutral.algae	0.00
52	2022	SA	1	Neutral.algae	0.00
53	2022	SA	2	Neutral.algae	0.00
54	2022	SA	3	Neutral.algae	0.00
55	2022	BL	1	Neutral.algae	0.00
56	2022	BL	2	Neutral.algae	0.00
57	2022	BL	3	Neutral.algae	0.00
58	2022	BO	1	Neutral.algae	0.00
59	2022	BO	2	Neutral.algae	0.00
60	2022	BO	3	Neutral.algae	0.00
61	2022	BA	1	Neutral.algae	0.00
62	2022	BA	2	Neutral.algae	0.00
63	2022	BA	3	Neutral.algae	0.00
64	2022	LU	1	Neutral.algae	0.00
65	2022	LU	2	Neutral.algae	0.00
66	2022	LU	3	Neutral.algae	0.00
67	2022	KS	1	Neutral.algae	0.00
68	2022	KS	2	Neutral.algae	2.01
69	2022	KS	3	Neutral.algae	0.78
70	2022	KP	1	Neutral.algae	0.25
71	2022	KP	2	Neutral.algae	0.00
72	2022	KP	3	Neutral.algae	0.00