Penilaian Resiliensi Terumbu Karang pada Perairan di Sekitar Pembangkit Listrik Tenaga UAP (PLTU)
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Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

DAFTAR PUSTAKA

Adjeroud, M., Kayal, M., dan Penin, L. (2017). Importance of Recruitment Processes in the Dynamics and Resilience of Coral Reef Assemblages. *Marine Animal Forests*, *September*, 1–1366. https://doi.org/10.1007/978-3-319-17001-5_12-1

Afandy, Z., Damar, A., Agus, S. B., dan Wiryawan, B. (2017). Coral Larval Dispersal Model on Conservation Area of Kapoposang Marine Tourism Park. *Coastal and Ocean Journal (COJ)*, *1*(2), 39–51. https://doi.org/10.29244/coj.1.2.39-51

Al-Yamani, F. Y., Polikarpov, I., Al-Ghunaim, A., dan Mikhaylova, T. (2014). *Field Guide of Marine Macroalgae of Kuwait* (1st ed.). Kuwait Institute for Scientific Research,.

Alavi, M., Visentin, D. C., Thapa, D. K., Hunt, G. E., Watson, R., dan Cleary, M. (2020). Exploratory factor analysis and principal component analysis in clinical studies : Which one should you use ? *Wiley*, *March*, 1886–1889. https://doi.org/10.1111/jan.14377

Allemand, D., dan Osborn, D. (2019). Ocean acidification impacts on coral reefs: From sciences to solutions. *Regional Studies in Marine Science*, *28*, 100558. https://doi.org/10.1016/j.rsma.2019.100558

Allen, G. R., dan Steene, R. C. (1994). *Indo-Pacific Coral Reef Field Guide*. Tropical Reef Research.

Allen, G., Steene, R., Humann, P., dan DeLoach, N. (2009). *Reef Fish Identification, Tropical Pacific. New World Publications, Inc., pp*. New World Publications.

Allgeier, J. E., Speare, K. E., dan Burkepile, D. E. (2018). Estimates of fish and coral larvae as nutrient subsidies to coral reef ecosystems. *Ecosphere*, *9*(6). https://doi.org/10.1002/ecs2.2216

Alvarado, J. J., Cortés, J., Guzman, H., dan Reyes-Bonilla, H. (2016a). Bioerosion by the sea urchin Diadema mexicanum along Eastern Tropical Pacific coral reefs. *Marine Ecology*, *37*(5), 1088–1102. https://doi.org/10.1111/maec.12372

Alvarado, J. J., Cortés, J., Guzman, H., dan Reyes-Bonilla, H. (2016b). Density, size, and biomass of Diadema mexicanum (Echinoidea) in Eastern Tropical Pacific coral reefs. *Aquatic Biology*, *24*(3), 151–161. https://doi.org/10.3354/ab00645

Angellia, V., dan Nugrahapraja, H. (2023). Study of the sea urchins (echinoidea) influence on the coral reef communities in the Nusa Dua Bali conservation area. *Environmental and Materials*, *1*(1), 20–27. https://doi.org/10.61511/eam.v1i1.2023.63

Arachchige, C. N. P. G., Prendergast, L. A., dan Staudte, R. G. (2022). Robust analogs to the coefficient of variation. *Journal of Applied Statistic*, *49*(2), 268–290.

Arifin, J. (2018). *Duh, 5.340 Meter Persegi Terumbu Karang di Binor Paiton Rusak*. Radar Bromo. https://radarbromo.jawapos.com/kraksaan/1001580033/duh-5340-meter-persegi-terumbu-karang-di-binor-paiton-rusak

ASEAN Secretariat. (2021). ASEAN Regional Action Plan for Combating Marine Debris in the ASEAN Member States. In *Asean*. https://asean.org/wp-content/uploads/2021/05/FINAL_210524-ASEAN-Regional-Action-Plan_Ready-to-Publish_v2.pdf

Astuti, L. (2021). *Deteksi Coral Reef Bleaching Menggunakan Citra Satelit Multisensor Resolusi Menengah di Perairan PLTU Paiton, Probolinggo*. Universitas Brawijaya. Skripsi.

Bachtiar, I., Damar, A., dan Zamani, N. P. (2019). Practical Resilience Index for Coral Reef Assessment. *Ocean Sci*, *54*(1), 117–127.

Bachtiar, I., Damar, A., Zamani, N. P., dan kunci, K. (2011). Assessing Ecological

UNIVERSITAS GADJAH MADA
Penilaian Resiliensi Terumbu Karang pada Perairan di Sekitar Pembangkit Listrik Tenaga UAP (PLTU) Paiton, Kabupaten Probolinggo
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Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Resilience of Eastern Indonesian Coral Reefs. *Journal of Indonesia Coral Reefs*, *1*(2), 91–98.

Bachtiar, I., Suharsono, Damar, A., dan Zamani, N. P. (2019). Practical Resilience Index for Coral Reef Assessment. *Ocean Science Journal*, *54*(1), 117–127. https://doi.org/10.1007/s12601-019-0002-1

Bang, A. H. Y., Kuo, C., Wen, C. K., dan Cherh, K. (2021). *Quantifying Coral Reef Resilience to Climate Change and Human Development : An Evaluation of Multiple Empirical Frameworks*. *7*(January), 1–12. https://doi.org/10.3389/fmars.2020.610306

Beeden, R., Willis, B. L., Raymundo, L. J., A., C., dan Weil, E. (2008). *Underwater Cards for Assessing Coral Health on Indo-Pacific Reefs*.

Bellwood, D. R., Hughes, T. P., dan Nystrom, M. (2004). Confronting the coral reef crisis. *Nature*, *429*(June), 827–833. https://doi.org/10.1007/978-3-540-25937-4_9

Bonansea, M., Ferrero, S., Ferral, A., Ledesma, M., Carreño, J., Rodriguez, C., Pinotti, L., Bonansea, M., Ferrero, S., Ferral, A., Ledesma, M., German, A., Carreño, J., Rodriguez, C., dan Pinotti, L. (2021). Assessing water surface temperature from Landsat imagery and its relationship with a nuclear power plant. *Hydrological Sciences Journal*, *66*(1), 50–58. https://doi.org/10.1080/02626667.2020.1845342

Botosoamananto, R. L., Todinanahary, G., Gasimandova, L. M., Randrianarivo, M., Penin, L., dan Adjeroud, M. (2025). Regulation of coral assemblages: Spatial and temporal variation in the abundance of recruits, juveniles, and adults. *Plos One*, *20*(8 August), 1–18. https://doi.org/10.1371/journal.pone.0329546

Brandt, M. E., Olinger, L. K., Chaves-Fonnegra, A., Olson, J. B., dan Gochfeld, D. J. (2019). Coral recruitment is impacted by the presence of a sponge community. *Marine Biology*, *166*(4), 1–13. https://doi.org/10.1007/s00227-019-3493-5

Bruno, J. F., Sweatman, H., Precht, W. F., Selig, E. R., dan Schutte, V. G. W. (2009). Assessing evidence of phase shifts from coral to macroalgal dominance on coral reefs. *Ecology*, *90*(6), 1478–1484.

Buerger, P., Schmidt, G. M., Wall, M., Held, C., dan Richter, C. (2015). Journal of Experimental Marine Biology and Ecology Temperature tolerance of the coral Porites lutea exposed to simulated large amplitude internal waves (LAIW). *Journal of Experimental Marine Biology and Ecology*, *471*, 232–239. https://doi.org/10.1016/j.jembe.2015.06.014

Burhanuddin, A., Omar, S. B. A., dan Zainuddin, E. N. (2025). *Population structure and growth patterns of Diadema setosum (Echinodermata : Diadematidae) in the coastal ecosystems of Buru Island , Maluku , Indonesia*. *26*(6), 2936–2945. https://doi.org/10.13057/biodiv/d260636

Burkepile, D. E., Allgeier, J. E., Shantz, A. A., Pritchard, C. E., Lemoine, N. P., Bhatti, L. H., dan Layman, C. A. (2013). Nutrient supply from fishes facilitates macroalgae and suppresses corals in a Caribbean coral reef ecosystem. *Scientific Reports*, *3*, 19–21. https://doi.org/10.1038/srep01493

Burt, J. A., Camp, E. F., Enochs, I. C., Johansen, J. L., Morgan, K. M., Riegl, B., dan Hoey, A. S. (2020). Insights from extreme coral reefs in a changing world. *Coral Reefs*, *39*(3), 495–507. https://doi.org/10.1007/s00338-020-01966-y

Cabrera-Rivera, E., Molina-Hernandez, A., Medellin-Maldonado, F., Guendulain-Garcia, S., Perez-Cervantes, E., Rioja-Nieto, R., Medina-Valmaseda, A. E., dan Alvarez-Filip, L. (2025). Night surveys reveal abundant populations of sea urchins with high erosive potential in Cayo Arenas, Campeche Bank. *Ciencias Marinas*, *50*(1B), 1–12.

Carlson, R. R., Li, J., Crowder, L. B., dan Asner, G. P. (2022). Large-scale effects of turbidity on coral bleaching in the Hawaiian islands. *Frontiers in Marine Science*,

UNIVERSITAS GADJAH MADA
Penilaian Resiliensi Terumbu Karang pada Perairan di Sekitar Pembangkit Listrik Tenaga UAP (PLTU) Paiton, Kabupaten Probolinggo
Berlania Mahardika Putri, Dr. Bachtiar Wahyu Mutaqin, S.Kel., M.Sc. ; Dr. Priyaji Agung Pambudi, S.Pd., M.Si.
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

9(September), 1–15. https://doi.org/10.3389/fmars.2022.969472

Ceccarelli, D. M., McLeod, I. M., Bostrom-Einarsson, L., Bryan, S. E., Chartrand, K. M., Emslie, M. J., Gibbs, M. T., Rivero, M. G., Hein, M. Y., Heyward, A., Kenyon, T. M., Lewis, B. M., Mattocks, N., Newlands, M., Schlappy, M. L., Suggett, D. J., dan Bay, L. K. (2020). Substrate stabilisation and small structures in coral restoration: State of knowledge, and considerations for management and implementation. *PLoS ONE*, *15*, 1–27. https://doi.org/10.1371/journal.pone.0240846

Chaijaroen, P. (2022). Coral Reef Deterioration and Livelihoods of Coastal Communities: An Economics Perspective. In *Corals - Habitat Formers From the Shallow to the Deep*.

Chambers, J. C., Allen, C. R., dan Cushman, S. A. (2020). Editorial: Operationalizing the Concepts of Resilience and Resistance for Managing Ecosystems and Species at Risk. *Frontiers in Ecology and Evolution*, *8*(168), 1–4. https://doi.org/10.3389/fevo.2020.00168

Chung, A. E., Wedding, L. M., Green, A. L., Friedlander, A. M., Goldberg, G., Meadows, A., dan Hixon, M. A. (2019). Building Coral reef resilience through spatial herbivore management. *Frontiers in Marine Science*, *6*(98), 1–12. https://doi.org/10.3389/fmars.2019.00098

Cinner, J. E., dan Barnes, M. L. (2019). Social Dimensions of Resilience in Social-Ecological Systems. *One Earth*, *1*(1), 51–56. https://doi.org/10.1016/j.oneear.2019.08.003

Clements, C. S., dan Hay, M. E. (2023). Disentangling the impacts of macroalgae on corals via effects on their microbiomes. *Frontiers in Ecology and Evolution*, *11*(June), 1–9. https://doi.org/10.3389/fevo.2023.1083341

Coppari, M., Mestice, F., Betti, F., Bavestrello, G., Castellano, L., dan Bo, M. (2019). Fragmentation, re-attachment ability and growth rate of the Mediterranean black coral Antipathella subpinnata. *Coral Reefs*, *38*(1), 1–14. https://doi.org/10.1007/s00338-018-01764-7

Corvianawatie, C., dan Abrar, M. (2018). Kesesuaian Kondisi Oseanografi Dalam Mendukung Ekosistem Terumbu Karang Di Pulau Pari. *Jurnal Kelautan Nasional*, *13*(3). https://doi.org/10.15578/jkn.v13i3.6322

Dahlberg, M., dan Sandstorm, A. (2024). Social networks that shape conservation outcome. *Environmental Science and Policy*, *151*. https://doi.org/10.1016/j.envsci.2023.103616

Dajka, J. C., Wilson, S. K., Robinson, J. P. W., Chong-Seng, K. M., Harris, A., dan Graham, N. A. J. (2019). Uncovering drivers of juvenile coral density following mass bleaching. *Coral Reefs*, *38*(4), 637–649. https://doi.org/10.1007/s00338-019-01785-w

Dang, V. D. H., Cheung, P. Y., Fong, C. L., Mulla, A. J., Shiu, J. H., Lin, C. H., dan Nozawa, Y. (2020). Sea Urchins Play an Increasingly Important Role for Coral Resilience Across Reefs in Taiwan. *Frontiers in Marine Science*, *7*(December), 1–8. https://doi.org/10.3389/fmars.2020.581945

Darling, E. S., McClanahan, T. R., Maina, J., Gurney, G. G., Graham, N. A. J., Januchowski-Hartley, F., Cinner, J. E., Mora, C., Hicks, C. C., Maire, E., Puotinen, M., Skirving, W. J., Adjeroud, M., Ahmadia, G., Arthur, R., Bauman, A. G., Beger, M., Berumen, M. L., Bigot, L., … Mouillot, D. (2019). Social–environmental drivers inform strategic management of coral reefs in the Anthropocene. *Nature Ecology and Evolution*, *3*(9), 1341–1350. https://doi.org/10.1038/s41559-019-0953-8

Déath, G., dan Fabricius, K. (2010). Water quality as a regional driver of coral biodiversity and macroalgae on the great barrier reef. *Ecological Applications*, *20*(3), 840–850.

UNIVERSITAS GADJAH MADA
Penilaian Resiliensi Terumbu Karang pada Perairan di Sekitar Pembangkit Listrik Tenaga UAP (PLTU) Paiton, Kabupaten Probolinggo
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https://doi.org/10.1890/08-2023.1

Devantier, L., Turak, E., dan Szava-kovats, R. (2020). *Species Richness and Abundance of Reef-Building Corals in the Indo-West Pacific : The Local – Regional Relation Revisited*. *7*(July), 1–19. https://doi.org/10.3389/fmars.2020.00487

Do Hung Dang, V., Fong, C. L., Shiu, J. H., dan Nozawa, Y. (2020). Grazing effects of sea urchin Diadema savignyi on algal abundance and coral recruitment processes. *Scientific Reports*, *10*(1), 1–9. https://doi.org/10.1038/s41598-020-77494-0

DPR RI. (2020). Laporan Kunjungan Kerja Spesifik Komisi IV DPR RI Ke Provinsi Jawa Timur Masa Sidang II Tahun Sidang 2020-2021 Tanggal 18-20 November 2020. In *Magazine*.

English, S., Wilkinson, C., dan Baker, V. (1997). *Survey manual for tropical marine resources (Second edi)*. AIMS.

English, S., Wilkinson, C., dan Baker, V. (1998). Survey manual for tropical marine resources. In *Survey manual for tropical marine resources. Second edition* (2nd ed.). Australian Institute of Marine Science.

Fabricius, K. E., Crossman, K., Jonker, M., Mongin, M., dan Thompson, A. (2023). Macroalgal cover on coral reefs: Spatial and environmental predictors, and decadal trends in the Great Barrier Reef. *PLoS ONE*, *18*(1), 1–21. https://doi.org/10.1371/journal.pone.0279699

Faqih, M. R. U., Sari, D., dan Joesidawati, M. I. (2025). Coral reef health index on Tunda Island , Banten , Indonesia. *BIO Web of Conferences*, *01002*.

Farshchi, M., Nasrolahi, A., dan Shokri, M. R. (2020). Variability in benthic invertebrate community structure near warm water effluents of a power plant in the southern Caspian Sea. *Regional Studies in Marine Science*, *40*, 101507. https://doi.org/10.1016/j.rsma.2020.101507

Fong, C. R., Smith, N., Catalan, E., Caraveo, B. A., Barber, P. H., dan Fong, P. (2024). Herbivorous sea urchins (Echinometra mathaei) support resilience on overfished and sedimented tropical reefs. *Scientific Reports*, *14*, 1–9. https://doi.org/10.1038/s41598-024-52222-0

GESAMP. (1984). *Thermal Discharges in the Marine Environment*.

Gibbs, D. A., dan West, J. M. (2019). Resilience assessment of Puerto Rico's coral reefs to inform reef management. *PLoS ONE*, *14*(11), 1–21. https://doi.org/10.1371/journal.pone.0224360

Giyanto, Abrar, M., Hadi, T. A., Budiyanto, A., Muhammad Hafizt, Salatalohy, A., dan Iswari, M. Y. (2017). *Status Terumbu Karang Di Indonesia 2017*.

Giyanto, Dewi, R., dan Azkiyah, B. U. (2023). Coral recruitment and its relationship to hard coral cover in the Derawan Islands , East Kalimantan Coral recruitment and its relationship to hard coral cover in the Derawan Islands , East Kalimantan. *MARBIOUTICOM-2022*. https://doi.org/10.1088/1755-1315/1137/1/012001

Giyanto, Manuputty, A. E. W., Abrar, M., Siringoringo, R. M., Suharti, S. R., Wibowo, K., Edrus, I. N., Arbi, U. Y., Cappenberg, H. A. W., Sihaloho, H. F., Tuti, Y., dan Zulfianita, D. (2014). Panduan Monitoring Kesehatan Terumbu Karang. In *Coremap CTI LIPI* (Nomor 1).

Giyanto, Mumby, P., Dhewani, N., Abrar, M., dan Iswari, M. Y. (2017). *Indeks Kesehatan Terumbu Karang* (Suharsono (ed.)). Puslit Oseanografi - LIPI.

Great Barrier Reef Foundation. (2018). Reef Resilience Framework. In *Great Barrier Reef Foundation*.

Gudka, M., Obura, D., Treml, E. A., dan Nicholson, E. (2024). Strengthening resilience potential assessments for coral reef management. *Methods in Ecology and Evolution*, *15*(4), 612–627. https://doi.org/10.1111/2041-210X.14303

UNIVERSITAS GADJAH MADA
Penilaian Resiliensi Terumbu Karang pada Perairan di Sekitar Pembangkit Listrik Tenaga UAP (PLTU) Paiton, Kabupaten Probolinggo
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Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Hadj-hammou, J., Bartholomew, A., Bento, R. C., Mohamed, F. A., Cavalcante, G. H., dan Burt, J. A. (2025). *Bleaching Impacts on the Last Remaining Acropora -dominated Reefs in the United Arab Emirates*. 1–30.

Hafizt, M., Adi, N. S., Munawaroh, M., Wouthuyzen, S., dan Adji, A. S. (2023). Coral Reef Health Index Calculation From Remote Sensing Data : A Review. *International Journal of Conservation Science*, *14*(1), 267–284. https://doi.org/10.36868/IJCS.2023.01.17

Halim, A., Loneragan, N. R., Wiryawan, B., Fujita, R., Adhuri, D. S., Hordyk, A. R., dan Sondita, M. F. A. (2020). Transforming traditional management into contemporary territorial-based fisheries management rights for small-scale fisheries in Indonesia. *Marine Policy*, *116*, 103923. https://doi.org/10.1016/j.marpol.2020.103923

Hasim, Hasmzah, S. N., Tolinggi, W., Sumrin, dan Sunani, M. R. F. H. (2025). The Socio-Ecological System of Coral Reef Conservation in Gorontalo Bay. *Egyptian Journal of Aquatic Biology and Fisheries*, *29*(5), 691–706.

Heenan, A., dan Williams, I. D. (2013). Monitoring Herbivorous Fishes as Indicators of Coral Reef Resilience in American Samoa. *PLoS ONE*, *8*(11). https://doi.org/10.1371/journal.pone.0079604

Herawati, E. Y., Maziyyah, S., Munir, M., Perdanawati, R. A., dan Khasanah, R. I. (2021). Relationship between coral fish community structure and coral cover in paiton waters, probolinggo-East Java, Indonesia. *AACL Bioflux*, *14*(3), 1213–1221. https://bioflux.com.ro/docs/2021.1213-1221.pdf

Herawati, E. Y., Valina, R., Dini, C. F. A., Cahyani, V., Handayani, M. P., Khasanah, R. I., Wiratno, E. N., dan Samuel, P. D. (2023). Eutrophication and distribution of dinoflagellates as an indicator of water quality in the Probolinggo coast, East Java, Indonesia. *AACL Bioflux*, *16*(4), 2174–2184. https://bioflux.com.ro/docs/2023. 2174-2184.pdf

Hill, J., dan Wilkinson, C. (2004). Methods for ecological monitoring of coral reefs. In *Australian Institute of Marine Science, Townsville*. https://doi.org/10.1017/CBO9781107415324.004

Hoeksema, B. W., Wels, D., van der Schoot, R. J., dan ten Hove, H. A. (2019). Coral injuries caused by Spirobranchus opercula with and without epibiotic turf algae at Curaçao. *Marine Biology*, *166*(5). https://doi.org/10.1007/s00227-019-3504-6

Hoey, A. S., Pratchett, M. S., dan Cvitanovic, C. (2011). High Macroalgal Cover and Low Coral Recruitment Undermines the Potential Resilience of the World ' s Southernmost Coral Reef Assemblages. *PLoS ONE*, *6*(10), 1–9. https://doi.org/10.1371/journal.pone.0025824

Holling, C. S. (1973). Resilience and Stability of Ecological Systems. *Annual Review of Ecology and Systematics*, *4*, 1–23. https://www.jstor.org/stable/2096802

Hong, T. T. K., dan Giao, N. T. (2022). Evaluating Coastal Water Quality in Soc Trang province, Vietnam. *NIPES - Journal of Science and Technology Research*, *4*(3), 23–29. https://doi.org/10.37933/nipes/4.3.2022.3

Howells, E. J., Beltran, V. H., Larsen, N. W., Bay, L. K., Willis, B. L., dan Van Oppen, M. J. H. (2012). Coral thermal tolerance shaped by local adaptation of photosymbionts. *Nature Climate Change*, *2*(2), 116–120. https://doi.org/10.1038/nclimate1330

Huang, W., Meng, L., Xiao, Z., Tan, R., dan Yang, E. (2024). Heat-tolerant intertidal rock pool coral Porites lutea can potentially adapt to future warming. *Molecular Ecology Wiley*, *February*. https://doi.org/10.1111/mec.17273

Hughes, T. P., Rodrigues, M. J., Bellwood, D. R., Ceccarelli, D., Hoegh-Guldberg, O., McCook, L., Moltschaniwskyj, N., Pratchett, M. S., Steneck, R. S., dan Willis, B. (2007). Phase Shifts, Herbivory, and the Resilience of Coral Reefs to Climate Change.

UNIVERSITAS GADJAH MADA
Penilaian Resiliensi Terumbu Karang pada Perairan di Sekitar Pembangkit Listrik Tenaga UAP (PLTU) Paiton, Kabupaten Probolinggo
Berlania Mahardika Putri, Dr. Bachtiar Wahyu Mutaqin, S.Kel., M.Sc. ; Dr. Priyaji Agung Pambudi, S.Pd., M.Si.
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Current Biology, *17*(4), 360–365. https://doi.org/10.1016/j.cub.2006.12.049

Humphries, A. T., Mcclanahan, T. R., dan Mcquaid, C. D. (2014). Differential impacts of coral reef herbivores on algal succession in Kenya. *Marine Ecology Progress Series*, *504*, 119–132. https://doi.org/10.3354/meps10744

Indra, Z. A. (2016). *Prevalensi Penyakit Band Diseases pada Karang Bercabang di Perairan Pembangkit Listrik Tenaga Uap (PLTU) Paiton, Probolinggo*. Institut Teknologi Sepuluh November. Skripsi.

Internasional, P. S. P. (2015). *Laporan Monitoring Lingkungan PT. Jawa Power PLTU Paiton Swasta Tahap II Proboliggo, Jawa Timur No 77 Status 1 September 2015* (Nomor 77).

Iqbal, M., Putra, H., Afatta, S., Wilson, J., dan Muljadi, A. (2015). Coral Reef Resilience in 17 Islands Marine Recreation Park, Riung – An Assessment of Functional Groups of Herbivorous Fish and Benthic Substrate. *Procedia Environmental Sciences*, *23*(Ictcred 2014), 230–239. https://doi.org/10.1016/j.proenv.2015.01.035

Isdianto, A., Amanda, S. S., Yamindago, A., Dewi, C. S. U., Aliviyanti, D., Luthfi, O. M., Fathah, A. L., Atikawati, D., Putri, B. M., dan Puspitasari, I. D. (2024). Water Quality Impact Christmas Tree Worms (Spirobranchus spp.) Distribution and Community Structure on Hard Corals at Sempu Island Nature Reserve, Malang, Indonesia. *Journal of Ecological Engineering*, *25*(5), 175–186. https://doi.org/10.12911/22998993/186161

Isdianto, A., Fewila, A. R., Rijal, S. S., Setyanto, A., Fathah, A. L., Atikawati, D., Putri, B. M., Puspitasari, I. D., dan Luthfi, O. M. (2024). Coral disease prevalence and compromised health in the Sempu Island Nature Reserve, Malang District, Indonesia. *Biodiversitas*, *25*(4), 1404–1412. https://doi.org/10.13057/biodiv/d250408

Isdianto, A., Kurniawan, A., Wicaksono, A. D., Nur, Q., Marhaendra, I., Putri, B. M., Fathah, A. L., Asadi, M. A., Luthfi, O. M., Pratiwi, D. C., dan Harahab, N. (2023). Observation of Coral Reef and Macroalgae Competition in the Sempu. *Journal of Ecological Engineering*, *24*(10), 174–184. https://doi.org/https://doi.org/10.12911/22998993/170246

Isdianto, A., Kurniawan, A., Wicaksono, A. D., Taufik, M. Z., Putri, B. M., Fathah, A. L., Setyanto, A., Luthfi, O. M., Pratiwi, D. C., dan Harahab, N. (2023). Assessment of Community Structure of Macroinvertebrates, Coral Cover and Water Quality in Sempu Strait, Malang Regency, East Java. *Journal of Ecological Engineering*, *24*(12), 99–111. https://doi.org/10.12911/22998993/172353

Isdianto, A., Wibowo, K. A., Satrya, C., Dewi, U., dan Rudianto, R. (2025). Macroinvertebrate Diversity and Tourism Impacts in Coral Reef Ecosystems: Comparative Analysis and Sustainable Management Implications from Tabuhan Island and Bangsring Underwater Beach, Indonesia. *International Journal of Sustainable Development and Planning*, *20*(10), 4267–4277. https://doi.org/doi.org/10.18280/ijsdp.201017

Isdianto, A., Yorarizka, P. D., Aliviyanti, D., Sari, S. H. J., Yanuar, A. T., Asadi, M. A., Setyanto, A., Bintoro, G., Lelono, T. D., Atikawati, D., Fathah, A. L., Putri, B. M., Supriyadi, dan Luthfi, O. M. (2024). Assessing the resilience of coral reefs against macroalgae invasion in the Sempu Island Nature Reserve, Malang District, Indonesia. *Biodiversitas*, *25*(7), 2877–2887. https://doi.org/10.13057/biodiv/d250709

Ith, S. O., Haissoune, A., Reid, A., dan Sor, R. (2025). *Community Structure , Health Status and Environmental Drivers of Coral Reefs in Koh Seh Island of the Kep Archipelago , Cambodia*. 1–11. https://doi.org/doi.org/10.3390/jmse13091644

IUCN. (2011). *Coral Reef Resilience Assessment of the Bonaire National Marine Park, Netherlands Antilles*. IUCN. http://data.iucn.org/dbtw-wpd/edocs/2011-008.pdf

UNIVERSITAS
GADJAH MADA
Penilaian Resiliensi Terumbu Karang pada Perairan di Sekitar Pembangkit Listrik Tenaga UAP (PLTU) Paiton, Kabupaten Probolinggo
Berlania Mahardika Putri, Dr. Bachtiar Wahyu Mutaqin, S.Kel., M.Sc. ; Dr. Priyaji Agung Pambudi, S.Pd., M.Si.
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Jaelani, L. M., dan Afifi, Z. (2016). Studi Pemetaan Pemutihan Terumbu Karang dengan Citra Resolusi Tinggi (Studi Kasus: Perairan PLTU Paiton, Probolinggo). *Geoid*, *11*(2), 144. https://doi.org/10.12962/j24423998.v11i2.1258

Januchowski-Hartley, F. A., Graham, N. A. J., Cinner, J. E., dan Russ, G. R. (2015). Local fishing influences coral reef fish behavior inside protected areas of the Indo-Pacific. *Biological Conservation*, *182*, 8–12. https://doi.org/10.1016/j.biocon.2014.11.024

Jiang, H. J., Underwood, T. C., Bell, J. G., Ranjan, S., Sasselov, D., dan Whitesides, G. M. (2017). Mimicking Lighting-Induced Electrochemistry on the Early Earth. *Proceedings of the National Academy of Sciences*, *120*, 2017. https://doi.org/10.1073/pnas

Jorissen, H., Galand, P. E., Bonnard, I., Meiling, S., Raviglione, D., Meistertzheim, A. L., Hédouin, L., Banaigs, B., Payri, C. E., dan Nugues, M. M. (2021). Coral larval settlement preferences linked to crustose coralline algae with distinct chemical and microbial signatures. *Scientific Reports*, 1–11. https://doi.org/10.1038/s41598-021-94096-6

Karcher, D. B., Roth, F., Carvalho, S., El-Khaled, Y. C., Tilstra, A., Kürten, B., Struck, U., Jones, B. H., dan Wild, C. (2020). Nitrogen eutrophication particularly promotes turf algae in coral reefs of the central Red Sea. *PeerJ*. https://doi.org/10.7717/peerj.8737

Kelley, R. (2012). *Coral Finder Indo Pacific* (Vol. 2).

Keshavmurthy, S., Kuo, C., Huang, Y., dan Carballo-bolaños, R. (2019). Coral Reef Resilience in Taiwan : Lessons from Long-Term Ecological Research on the Coral Reefs of Kenting National Park (Taiwan). *Journal of Marine Science and Engineering*, *7*. https://doi.org/doi.org/10.3390/jmse7110388

Khasanah, R. I., Herawati, E. Y., dan Hariati, A. M. (2019). Growth rate of Acropora formosa coral fragments transplanted on different composition of faba kerbstone artificial reef. *Biodiversitas*, *20*(12), 3593–3598. https://doi.org/10.13057/biodiv/d201218

Kleypas, J. A., McManus, J. W., dan Menez, A. B. (1999). Environmental Limits to Coral Reef Development : Where Do We Draw the Line? *American Zoology*, *39*(1), 146–159. https://www.jstor.org/stable/3884233

Knudby, A., Jupiter, S., Roelfsema, C., Lyons, M., dan Phinn, S. (2013). Mapping Coral Reef Resilience Indicators Using Field and Remotely Sensed Data. *Remote Sensing*, *5*, 1311–1334. https://doi.org/10.3390/rs5031311

Koester, A., Ford, A. K., Ferse, S. C. A., Migani, V., Bunbury, N., Sanchez, C., dan Wild, C. (2021a). First insights into coral recruit and juvenile abundances at remote Aldabra Atoll, Seychelles. *PLoS ONE*, *16*(12 December), 1–19. https://doi.org/10.1371/journal.pone.0260516

Koester, A., Ford, A. K., Ferse, S. C. A., Migani, V., Bunbury, N., Sanchez, C., dan Wild, C. (2021b). First insights into coral recruit and juvenile abundances at remote Aldabra Atoll , Seychelles. *PLoS ONE*, *16*(12), 1–19. https://doi.org/10.1371/journal.pone.0260516

Koester, A., Gordó−Vilaseca, C., Bunbury, N., Ferse, S. C. A., Ford, A., Haupt, P., A'Bear, L., Bielsa, M., Burt, A. J., Letori, J., Mederic, E., Nancy, E., Sanchez, C., Waller, M., dan Wild, C. (2023). Impacts of coral bleaching on reef fish abundance, biomass and assemblage structure at remote Aldabra Atoll, Seychelles: insights from two survey methods. *Frontiers in Marine Science*, *10*, 1230717. https://doi.org/10.3389/fmars.2023.1230717

Kordi, G. (2010). *Ekosistem Terumbu Karang*. PT Asdi Mahasatya. https://doi.org/doi.org/978-979-518-993-0

Krebs, C. J. (2014). Ecology: The Experimental Analysis of Distribution and Abundance.

Penilaian Resiliensi Terumbu Karang pada Perairan di Sekitar Pembangkit Listrik Tenaga UAP (PLTU)
Paiton, Kabupaten Probolinggo
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Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

In *BioScience* (6th ed., Vol. 23, Nomor 4). Pearson Education Limited. https://doi.org/10.2307/1296598

Kristian, T. D. (2019). *Pemodelan Sebaran Suhu Air Bahang dan Analisis Korelasi Suhu Perairan Terhadap Kelimpahan Fitoplankton di Perairan PLTU Paiton*. Universitas Brawijaya. Skripsi.

Kuhn, M. (2008). Building Predictive Models in R Using the caret Package. *Journal of Statistical Software*, *28*(5). https://doi.org/doi.org/10.18637/jss.v028.i05

Kumar, P., dan Mina, U. (2014). Fundamentals of Ecology and Environment. In *Dairy Science & Technology, CRC Taylor & Francis Group* (Nomor June).

Lam, V. Y. Y., Doropoulos, C., Bozec, Y. M., dan Mumby, P. J. (2020). Resilience Concepts and Their Application to Coral Reefs. *Frontiers in Ecology and Evolution*, *8*(March), 1–14. https://doi.org/10.3389/fevo.2020.00049

Leng, Q., Mohamat-Yusuff, F., Mohamed, K. N., Zainordin, N. S., dan Hassan, M. Z. (2024). Impacts of thermal and cold discharge from power plants on marine benthos and its mitigation measures: a systematic review. *Frontiers in Marine Science*, *11*(December). https://doi.org/10.3389/fmars.2024.1465289

Lentz, M. E., Freel, E. B., Forsman, Z. H., Schar, D. W. H., dan Toonen, R. J. (2024). Flow rates alter the outcome of coral bleaching and growth experiments. *Discover Oceans*, *1*(31). https://doi.org/10.1007/s44289-024-00034-5

Lima, L. F. O., Bursch, H., dan Dinsdale, E. A. (2022). Win some, lose some: The ecophysiology of Porites astreoides as a key coral species to Caribbean reefs. *Frontiers in Marine Science*, *9*(908734), 1–9. https://doi.org/10.3389/fmars.2022.908734

Luthfi, O. M., Rahmadita, V. L., dan Setyohadi, D. (2018). Looking at the Ecological Equilibrium Condition of Coral Reefs on Sempu Island, Malang Using the Hard Coral (Scleractinia) Colony Area Approach. *Ilmu Lingkungan*, *16*(1), 1–8. https://doi.org/10.14710/jil.16.1.1-8

Martins, C. P. P., Ziegler, M., Schubert, P., Wilke, T., dan Wall, M. (2024). Effects of water flow and ocean acidification on oxygen and pH gradients in coral boundary layer. *Scientific Reports*, *14*(12757), 1–15. https://doi.org/10.1038/s41598-024-63210-9

Maynard, J. A., Marshall, P. A., Parker, B., Mcleod, E., Ahmadia, G., van Hooidonk, R., Planes, S., William, G. J., Raymundo, L., Beeden, R., dan Tamelander, J. (2017). *Coral Reef Resilience For decision support*. UN Environment.

Maynard, J. A., Mckagan, S., Raymundo, L., Johnson, S., Ahmadia, G. N., Johnston, L., Houk, P., Williams, G. J., Kendall, M., Heron, S. F., Hooidonk, R. Van, Mcleod, E., Tracey, D., dan Planes, S. (2015). Assessing relative resilience potential of coral reefs to inform management. *BIOC*, *192*, 109–119. https://doi.org/10.1016/j.biocon.2015.09.001

Maynard, J., dan McLead, L. (2012). How to guide for conducting resilience assessment. In *The Nature Conservancy*.

Maynard J, Wilson, J., Campbell, S., Mangubhai, S., Setiasih, N., Sartin, J., Ardiwijaya, R., Obura, D., Marshall, P., Salm, R., Heron, S., dan Goldberg, J. (2012). *Assessing coral resilience and bleaching impacts in the Indonesian archipelago*. Technical Report to The Nature Conservancy with contributions from Wildlife Conservation Society and Reef Check Foundation Indonesia.

Mazziyah, S. (2019). *Hubungan parameter fisika-kimia air dengan tutupan karang dan struktur komunitas ikan karang di perairan paiton probolinggo*. Universitas Islam Negeri Sunan Apel. Skripsi.

McCarthy, O. S., Pomeroy, M. W., dan Smith, J. E. (2024). Corals that survive repeated thermal stress show signs of selection and acclimatization. *PLoS ONE*, *19*(7 July), 1–

UNIVERSITAS GADJAH MADA
Penilaian Resiliensi Terumbu Karang pada Perairan di Sekitar Pembangkit Listrik Tenaga UAP (PLTU) Paiton, Kabupaten Probolinggo
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25. https://doi.org/10.1371/journal.pone.0303779

McClanahan, T. R., Donner, S. D., Maynard, J. A., MacNeil, M. A., Graham, N. A. J., Maina, J., Baker, A. C., Alemu I., J. B., Beger, M., Campbell, S. J., Darling, E. S., Eakin, C. M., Heron, S. F., Jupiter, S. D., Lundquist, C. J., McLeod, E., Mumby, P. J., Paddack, M. J., Selig, E. R., dan van Woesik, R. (2012). Prioritizing Key Resilience Indicators to Support Coral Reef Management in a Changing Climate. *PLoS ONE*, *7*(8). https://doi.org/10.1371/journal.pone.0042884

Mcclanahan, T. R., Graham, N. A. J., Macneil, M. A., Muthiga, N. A., dan Cinner, J. E. (2011). Critical thresholds and tangible targets for ecosystem-based management of coral reef fisheries. *PNAS*, *108*(41), 17230–17233. https://doi.org/10.1073/pnas.1106861108

McClanahan, T. R., Schroeder, R. E., Friedlander, A. M., Vigliola, L., Wantiez, L., Caselle, J. E., Graham, N. A. J., Wilson, S., Edgar, G. J., Stuart-smith, R. D., Oddenyo, R. M., dan Cinner, J. E. (2019). Global baselines and benchmarks for fish biomass : comparing remote reefs and fisheries closures. *Marine Ecology Progress Series*, *612*, 167–192. https://doi.org/doi.org/10.3354/meps12874 MARINE

McWilliam, M., Pratchett, M. S., Hoogenboom, M. O., dan Hughes, T. P. (2019). Deficits in functional trait diversity following recovery on coral reefs. *Royal Society B*. https://doi.org/dx.doi.org/10.1098/rspb.2019.2628

Mills, M. S., Schils, T., Olds, A. D., dan Leon, J. X. (2023). Structural Complexity of Coral Reefs in Guam, Mariana Islands. *Remote Sensing*, *15*(23), 1–15. https://doi.org/10.3390/rs15235558

Miththapala, S. (2008). *Coral Reefs-Coastal Ecosystems Series* (Vol. 1). Ecosystems and Livelihoods Group Asia, IUCN.

Moberg, F., Nyström, M., Kautsky, N., Tedengren, M., dan Jarayabhand, P. (1997). Effects of reduced salinity on the rates of photosynthesis and respiration in the hermatypic corals Porites lutea and Pocillopora damicornis. *Marine Ecology Progress Series*, *157*(October), 53–59. https://doi.org/10.3354/meps157053

Moeller, M., Pawlowski, S., Petersen-Thiery, M., Miller, I. B., Nietzer, S., Heisel-Sure, Y., Kellermann, M. Y., dan Schupp, P. J. (2021). Challenges in Current Coral Reef Protection – Possible Impacts of UV Filters Used in Sunscreens, a Critical Review. *Frontiers in Marine Science*, *8*(665548), 1–16. https://doi.org/10.3389/fmars.2021.665548

Morgan, K. M., Moynihan, M. A., Sanwlani, N., dan Switzer, A. D. (2020). Light Limitation and Depth-Variable Sedimentation Drives Vertical Reef Compression on Turbid Coral Reefs. *Frontiers in Marine Science*, *7*(571256), 1–13. https://doi.org/10.3389/fmars.2020.571256

Muchlisin, C. (2015). *Struktur Komunitas Ikan Karang Di Perairan Terdampak Air Bahang PLTU Paiton Probolinggo*. Institut Teknologi Sepuluh November. Skripsi.

Munasik, M., Sabdono, A., Hutapea, E. D., Sugiyanto, S., dan Sugianto, D. N. (2021). Coral Recruitment on Artificial Patch Reefs Deployed in The Marginal Reefs: Effect of Multilevel Substrate on Density of Coral Recruit. *Jurnal Segara*, *17*(1), 33. https://doi.org/10.15578/segara.v17i1.10064

Muzaki, F., dan Saptarini, D. (2012). Status of coral reefs before and after mass bleaching event 2010 in coastal water of PLTU Paiton. *IBOC (International Biology Conference)*.

Natural Resources Wales. (2016). *The State of Natural Resources Report (SoNaRR): Assessment of the Sustainable Management of Natural Resources. Chapter 4. Resilient Ecosystems*. www.naturalresourceswales.gov.ukwww.naturalresourceswales.gov.uk

UNIVERSITAS GADJAH MADA
Penilaian Resiliensi Terumbu Karang pada Perairan di Sekitar Pembangkit Listrik Tenaga UAP (PLTU) Paiton, Kabupaten Probolinggo
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Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Neilson, B. J., Wall, C. B., Mancini, F. T., dan Gewecke, C. A. (2018). Herbivore biocontrol and manual removal successfully reduce invasive macroalgae on coral reefs. *PeerJ*, *2018*(8), 1–27. https://doi.org/10.7717/peerj.5332

Newport, C., Padget, O., dan de Perera, T. B. (2021). High turbidity levels alter coral reef fish movement in a foraging task. *Scientific Reports*, *11*(1), 1–10. https://doi.org/10.1038/s41598-021-84814-5

Noonan, K., Fair, T., Matthee, K., Sox, K., dan Smith, K. (2021). Reef Fish Associations with Natural and Artificial Structures in the Florida Keys. *Oceans*, *2*, 634–647. https://doi.org/doi.org/10.3390/oceans2030036

O'Leary, J. K., Micheli, F., Airoldi, L., Boch, C., De Leo, G., Elahi, R., Ferretti, F., Graham, N. A. J., Litvin, S. Y., Low, N. H., Lummis, S., Nickols, K. J., dan Wong, J. (2017). The resilience of marine ecosystems to climatic disturbances. *BioScience*, *67*(3), 208–220. https://doi.org/10.1093/biosci/biw161

Obura, D., dan Grimsditch, G. (2009a). Coral Reefs , Climate Change and Resilience. In *An Agenda for Action from the IUCN World Conservation Congress in Barcelona, Spain* (Nomor 6).

Obura, D., dan Grimsditch, G. (2009b). Resilience Assessment of Coral Reefs – Rapid Assessment Protocol for Coral Reefs, Focusing on Bleaching and Thermal Stress. In *Coral Reefs* (Nomor 5). http://cmsdata.iucn.org/downloads/resilience_assessment_final.pdf

Oli, A. P., Roeroe, K. A., Paruntu, C. P., Kusen, J. D., Indri, S., dan Mandagi, S. V. (2022). Study Of Hard Coral (Scleractinia) Recruitment In The Molas Waters, Manado City. *Jurnal Ilmiah Platax*, *10*(June). https://doi.org/10.35800/jip.v10i1.37489

Paiton Energy. (n.d.). *Tentang Kami*. Paiton Energy. Diambil 22 Maret 2025, dari https://paitonenergy.com/id/tentang-kami/

Paiton, P. P. U. P. (2017). Dokumen Ringkasan Kinerja Pengelolaan Lingkungan 2017. In *PJB PT Pembangkitan Jawa-Bali Unit Pembangkitan Paiton*. http://scioteca.caf.com/bitstream/handle/123456789/1091/RED2017-Eng-8ene.pdf?sequence=12&isAllowed=y%0Ahttp://dx.doi.org/10.1016/j.regsciurbeco.2008.06.005%0Ahttps://www.researchgate.net/publication/305320484_SISTEM_PEMBETUNGAN_TERPUSAT_STRATEGI_MELESTARI

Pandriadi, Harling, V. N. Van, Wahab, A., Vaulina, S., Sutjiningtyas, S., Ningsih, E. K., Dwi, B., Setyono, H., Rizqi, V., Harisuddin, M. I., Gaffar, S., Yuniarti, T., Rahmawati, A., Faujiyah, F., Mudawanah, S., Maulana, S., Rohana, H., dan Shandy, S. (2023). *Statistika Dasar* (M. T. Sary Shandy, S.T. & D. Y. E. K. Rahmantya (ed.); 1 ed.). Widina Media Utama.

Pastorok, R., dan Bilyard, G. (1985). Effects of Sewage Pollution on Coral-Reef Communities. *Marine Ecology Progress Series*, *21*, 175–189. https://doi.org/10.3354/meps021175

Patricia, C., Astono, W., dan Hendrawan, D. I. (2019). Kandungan nitrat dan fosfat di Sungai Ciliwung. *Seminar Nasional Cendekiawan ke 4*, *4*, 179–185. https://doi.org/doi.org/10.25105/SEMNAS.V0I0.3373

Patthanasiri, K., Lirdwitayaprasit, T., Yeemin, T., Thongcamdee, I., dan Potisarn, N. (2022). *Effects of Temperature and Salinity on Coral Bleaching in*. *13*(1). https://doi.org/10.18178/ijesd.2022.13.1.1367

Pattiasina, T. F., Sartimbul, A., Herawati, E. Y., Krey, M., dan Simatauw, F. F. (2020). Assessing functional diversity and biomass of herbivorous fish as resilience indicators of coral reef ecosystems in Doreri Bay , Manokwari Regency , Indonesia. *AACL Bioflux*, *13*(3), 1522–1534. https://bioflux.com.ro/docs/2020.1522-1534.pdf

Pereira, L. (2021). Macroalgae. *MDPI*, *1*, 177–188.

UNIVERSITAS
GADJAH MADA
Penilaian Resiliensi Terumbu Karang pada Perairan di Sekitar Pembangkit Listrik Tenaga UAP (PLTU) Paiton, Kabupaten Probolinggo
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https://doi.org/doi.org/10.3390/encyclopedia1010017

Peterson, G., Allen, C. R., dan Holling, C. S. (1998). Original Articles: Ecological Resilience, Biodiversity, and Scale. *Ecosystems*, *1*(1), 6–18.

Pintubatu, K. L., Widada, S., Marwoto, J., dan Satriadi, A. (2020). Studi Pola Sebaran Suhu Permukaan Laut Akibat Air Bahang Pembangkit Listrik Tenaga Uap (PLTU) Paiton Probolinggo Jawa Timur. *Indonesian Journal of Oceanography*, *2*(2), 173–181. https://doi.org/10.14710/ijoce.v2i2.8068

PP Nomor 22 Tahun 2021. (2021). Peraturan Pemerintah Nomor 22 Tahun 2021 tentang Pedoman Perlindungan dan Pengelolaan Lingkungan Hidup. *Sekretariat Negara Republik Indonesia*, *1*(078487A), 1–483. http://www.jdih.setjen.kemendagri.go.id/

Prasetya, Y. E., Hidayat, A. R. T., dan Dinanti, D. (2019). Village Development Index of Probolinggo Coastal Villages Case study: Bhinor Village, Paiton District. *IOP Conference Series: Earth and Environmental Science*, *328*(1). https://doi.org/10.1088/1755-1315/328/1/012056

Putra, M. I. H., Afatta, S., Wilson, J., Muljadi, A., dan Yusidarta, I. (2015). Coral Reef Resilience in 17 Islands Marine Recreation Park, Riung – An Assessment of Functional Groups of Herbivorous Fish and Benthic Substrate. *Procedia Environmental Sciences*, *23*(Ictcred 2014), 230–239. https://doi.org/10.1016/j.proenv.2015.01.035

Quinlan, Z. A., Bennett, M. J., Arts, M. G. I., Levenstein, M., Flores, D., Tholen, H. M., Tichy, L., Juarez, G., Haas, A. F., Chamberland, V. F., Latijnhouwers, K. R. W., Vermeij, M. J. A., Johnson, A. W., Marhaver, K. L., dan Kelly, L. W. (2023). Coral larval settlement induction using tissue-associated and exuded coralline algae metabolites and the identification of putative chemical cues. *Proceedings of the Royal Society B: Biological Sciences*, *290*(2009). https://doi.org/10.1098/rspb.2023.1476

Rahman, A., Haris, A., dan Jamaluddin. (2014). Pola Rekrutmen Karang Scleractinia Pada Kondisi Lingkungan Berbeda. *Jurnal Sains dan Teknologi*, *14*(3), 209–219.

Ramlah, S., Fajri, N. El, dan Adriman. (2015). Physical, Chemical Parameters and Saphrobic Coefficients (X) as Determinants of Water Quality in the Senapelan River, Pekanbaru. *Jurnal Online Mahasiswa Fakultas Perikanan Dan Ilmu Kelautan Universitas Riau*, 329–332. https://www.neliti.com/publications/201188/physical-chemical-parameters-and-saphrobic-coefficients-x-as-determinants-of-wat#cite

Raymundo, L. J., Couch, C. S., Bruckner, A. W., dan Harvell, C. D. (2008). Coral Disease Handbook: Guidelines for Assessment, Monitoring, and Management. In *CRTR*.

Razak, T. B., Irhas, M., Nikita, L., Vida, R. T., Maserati, S., Aja, C., dan Alisa, G. (2025). Coral Bleaching and Recovery on Urban Reefs off Jakarta , Indonesia , During the 2023 – 2024 Thermal Stress Event. *MDPI*, *17*, 1–9.

Ribes, M., Yahel, G., Romera-Castillo, C., Mallenco, R., Morganti, T. M., dan Coma, R. (2023). The removal of dissolved organic matter by marine sponges is a function of its composition and concentration: An in situ seasonal study of four Mediterranean species. *Science of the Total Environment*, *871*(February), 161991. https://doi.org/10.1016/j.scitotenv.2023.161991

Richmond, R. H., dan Hunter, C. L. (1990). Reproduction and recruitment of corals: comparisons among the Caribbean, the Tropical Pacific and the Red Sea. *Marine Ecology Progress Series*, *60*(2), 185–203. https://doi.org/10.1007/s10492-004-6432-8

Ricot, M., Jeetun, S., Jogee, S. Y., Kaullysing, D., Taleb-hossenkhan, N., Mbui, M. J., Casareto, B. E., Suzuki, Y., Wijayanti, D. P., dan Bhagooli, R. (2024). The Coral Reefs and Fishes of St . Brandon, Indian Ocean Archipelago : Implications for Sustainable Fisheries. *MDPI*. https://doi.org/doi.org/10.3390/d16120710

UNIVERSITAS GADJAH MADA
Penilaian Resiliensi Terumbu Karang pada Perairan di Sekitar Pembangkit Listrik Tenaga UAP (PLTU) Paiton, Kabupaten Probolinggo
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Riznawati, A. E. (2015). *Prevalensi White Syndrome Pada Karang Masif di Perairan Pembangkit Listrik Tenaga Uap (PLTU) Paiton, Probolinggi*. Institut Teknologi Sepuluh November. Skripsi.

Robinson, J. P. W., Williams, I. D., Edwards, A. M., McPherson, J., Yeager, L., Vigliola, L., Brainard, R. E., dan Baum, J. K. (2017). Fishing degrades size structure of coral reef fish communities. *Global Change Biology*, *23*(3), 1009–1022. https://doi.org/10.1111/gcb.13482

Rosset, S., Wiedenmann, J., Reed, A. J., dan D'Angelo, C. (2017). Phosphate deficiency promotes coral bleaching and is reflected by the ultrastructure of symbiotic dinoflagellates. *Marine Pollution Bulletin*, *118*(1–2), 180–187. https://doi.org/10.1016/j.marpolbul.2017.02.044

Safaie, A., Silbiger, N. J., Mcclanahan, T. R., Pawlak, G., Barshis, D. J., Hench, J. L., Rogers, J. S., Williams, G. J., dan Davis, K. A. (2018). High frequency temperature variability reduces the risk of coral bleaching. *Nature Communications*, *2018*(apr), 1–12. https://doi.org/10.1038/s41467-018-04074-2

Samperiz, A., Sosdian, S., Hendy, E., Johnson, K., John, E. H., Jupiter, S. D., dan Albert, S. (2025). Coastal seawater turbidity and thermal stress control growth of reef-building Porites spp. corals in Fiji. *Scientific Reports*, *15*(1), 1–15. https://doi.org/10.1038/s41598-025-02283-6

Sangaji, M. (2015). *Macroalgae Abundance And Cover As Ecological Indicators Of Coral Reef Management In The Waters Of Katapang Village , West Seram Regency , Maluku Province*. 121–126. https://doi.org/doi.org/10.51601/ijse.v2i4.47

Saptarini, D., Mukhtasor, dan Rumengan, I. F. M. (2017). Short communication: Coral reef lifeform variation around power plant activity: Case study on coastal area of Paiton Power Plant, East Java, Indonesia. *Biodiversitas*, *18*(1), 116–120. https://doi.org/10.13057/biodiv/d180117

Setiawan, F., Muttaqin, A., Tarigan, S. A., Sabil, A., dan Pinkan, J. (2017). Pemutihan Karang Akibat Pemanasan Global Tahun 2016 Terhadap Ekosistem Terumbu Karang: Studi Kasus di TWP Gili Matra (Gili Air, Gili Meno Dan Gili Trawangan) Provinsi NTB. *Journal of Fisheries and Marine Science*, *1*(2). https://doi.org/doi.org/10.21776/ub.jfmr.2017.001.02.1

Setyawan, W. E., Haq, A., Sudiarjo, T., dan Pramandira, A. (2022). *Melihat ulang dampak PLTU di tiga wilayah : PLTU Paiton, PLTU Pacitan dan PLTU Cilacap*. WALHI.

Sheppard, C. E., Williams, G. J., Exton, D. A., dan Keith, S. A. (2023). Co-occurrence of herbivorous fish functional groups correlates with enhanced coral reef benthic state. *Global Ecology and Biogeography*, *32*(3), 435–449. https://doi.org/10.1111/geb.13638

Shodiqin, M. A., dan Jaelani, L. M. (2016). *Studi Total Suspended Solid Dan Tranparansi Perairan Menggunakan Citra Satelit Worldview-2 Sebagai Faktor Pembatas Pertumbuhan Terumbu Karang (Studi Kasus: Perairan PLTU Paiton, Kabupaten Probolinggo)*. Insitut Teknologi Sepuluh Nopember. Skripsi.

Smith, H. A., Fulton, S. E., McLeod, I. M., Page, C. A., dan Bourne, D. G. (2023). Sea-weeding: Manual removal of macroalgae facilitates rapid coral recovery. *Journal of Applied Ecology*, *60*(11), 2459–2471. https://doi.org/10.1111/1365-2664.14502

Smith, J. N., Mongin, M., Thompson, A., Jonker, M. J., De'ath, G., dan Fabricius, K. E. (2020). Shifts in coralline algae, macroalgae, and coral juveniles in the Great Barrier Reef associated with present-day ocean acidification. *Global Change Biology*, *26*(4), 2149–2160. https://doi.org/10.1111/gcb.14985

Solichah, Z. (2018). *Transplantasi Terumbu Karang dari Batok Kelapa Diuji Coba di Probolinggo*. ANTARA. https://jatim.antaranews.com/berita/261354/transplantasi-

UNIVERSITAS GADJAH MADA
Penilaian Resiliensi Terumbu Karang pada Perairan di Sekitar Pembangkit Listrik Tenaga UAP (PLTU) Paiton, Kabupaten Probolinggo
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terumbu-karang-dari-batok-kelapa-diuji-coba-di-probolinggo?&m=false

Steneck, R. S., Arnold, S. N., Boenish, R., de León, R., Mumby, P. J., Rasher, D. B., dan Wilson, M. W. (2019). Managing recovery resilience in coral reefs against climate-induced bleaching and hurricanes: A 15 year case study from Bonaire, Dutch Caribbean. *Frontiers in Marine Science*, *6*(265), 1–12. https://doi.org/10.3389/fmars.2019.00265

Stewart, R. H. (1987). Physical oceanography. In *Deep Sea Research Part B. Oceanographic Literature Review* (Vol. 34, Nomor 8). https://doi.org/10.1016/0198-0254(87)95466-5

Sundarambal, P., Tkalich, P., dan Balasubramanian, R. (2010). Impact of biomass burning on ocean water quality in Southeast Asia through atmospheric deposition: Eutrophication modeling. *Atmospheric Chemistry and Physics*, *10*(23), 11337–11357. https://doi.org/10.5194/acp-10-11337-2010

Supiandi. (2024). Tourism at the Edge: Community Narratives of Climate Change and Coastal Erosion in Lombok. *Advances in Tourism*, *2*(4), 276–285. https://doi.org/https://doi.org/10.53893/ats.v2i4.69

Supriyadi, Sawiji, A., dan Maisaroh, D. S. (2020). Pengaruh Faktor Oseanografi dan Suspensi Sedimen terhadap Pertumbuhan dan Mortalitas Karang Transplantasi (Acropora spp.) di Paiton, Probolinggo. *Journal Of Marine Resources And Coastal Management*, *1*(1), 7–16. https://doi.org/doi.org/10.29080/mrcm.v1i1.749

Suryanti, S., Fatimah, P. N. P. N., dan Rudiyanti, S. (2020). Morfologi, Anatomi dan Indeks Ekologi Bulu Babi di Pantai Sepanjang, Kabupaten Gunungkidul, Yogyakarta. *Buletin Oseanografi Marina*, *9*(2), 93–103. https://doi.org/10.14710/buloma.v9i2.31740

Tarigan, S. A. R., Munasik, Wijayanti, D. P., Muhidin, Rohman, E. A., dan Pardede, S. (2024). Dynamic of coral recruits in the Karimunjawa National Park, Central Java, Indonesia. *Biodiversitas*, *25*(2), 869–880. https://doi.org/10.13057/biodiv/d250247

Teixeira, T. P., Neves, L. M., dan Araújo, F. G. (2009). Effects of a nuclear power plant thermal discharge on habitat complexity and fish community structure in Ilha Grande Bay, Brazil. *Marine Environmental Research*, *68*(4), 188–195. https://doi.org/10.1016/j.marenvres.2009.06.004

Tempo.co. (2018a). *Destinasi Wisata Terumbu Karang Pantai Binor Probolinggo Rusak*. TEMPO. https://www.tempo.co/hiburan/destinasi-wisata-terumbu-karang-pantai-binor-probolinggo-rusak-832597

Tempo.co. (2018b). *Kerusakan Terumbu Karang di Pantai Binor Akan Diproses Hukum*. TEMPO. https://www.tempo.co/ekonomi/kerusakan-terumbu-karang-di-pantai-binor-akan-diproses-hukum-828828

The Coral Reef Alliance. (2003). Introduction to coral reef ecosystems , threats , and solutions. In *The Coral Reef Alliance (CORAL)*.

Trialfhianty, T. I., Quinn, C. H., dan Beger, M. (2025). Engaging customary law to improve the effectiveness of marine protected areas in Indonesia. *Ocean and Coastal Management*, *261*(August 2023), 107543. https://doi.org/10.1016/j.ocecoaman.2025.107543

Tuttle, L. J., dan Donahue, M. J. (2020). *Thresholds for sediment stress on corals: A systematic review and meta-analysis*. NOAA Fisheries Pacific Islands. https://doi.org/10.13140/RG.2.2.35176.70403

Tuttle, L. J., dan Donahue, M. J. (2022). Effects of sediment exposure on corals: a systematic review of experimental studies. *Environmental Evidence*, *11*(1), 1–33. https://doi.org/10.1186/s13750-022-00256-0

Veron, J. E. ., Stafford-Smith, M. G., Turak, E., dan DeVantier, L. M. (2016). *Corals of the*

Penilaian Resiliensi Terumbu Karang pada Perairan di Sekitar Pembangkit Listrik Tenaga UAP (PLTU)
Paiton, Kabupaten Probolinggo
Berlania Mahardika Putri, Dr. Bachtiar Wahyu Mutaqin, S.Kel., M.Sc. ; Dr. Priyaji Agung Pambudi, S.Pd., M.Si.
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

World.

Vincent, I. V, Hincksman, C. M., Tibbetts, I. R., dan Harris, A. (2011). Biomass and Abundance of Herbivorous Fishes on Coral Reefs off Andavadoaka, Western Madagascar. *Western Indian Ocean Journal of Marine Science*, *10*(1), 83–98. https://www.researchgate.net/publication/229590387_Biomass_and_Abundance_of_Herbivorous_Fishes_on_Coral_Reefs_off_Andavadoaka_Western_Madagascar

Voolstra, C. R., Suggett, D. J., Peixoto, R. S., Parkinson, J. E., Quigley, K. M., Silveira, C. B., Sweet, M., Muller, E. M., Barshis, D. J., Bourne, D. G., dan Aranda, M. (2021). Extending the natural adaptive capacity of coral holobionts. *Nature Reviews Earth and Environment*, *2*(11), 747–762. https://doi.org/10.1038/s43017-021-00214-3

Watch, N. C. R. (2016). *2016 Annual Summaries of Thermal Conditions Related to Coral Bleaching for the U.S. Coral Reef Jurisdictions*.

Webster, F. J., Babcock, R. C., Keulen, M. Van, dan Loneragan, N. R. (2015). Macroalgae Inhibits Larval Settlement and Increases Recruit Mortality at Ningaloo Reef , Western Australia. *PLoS ONE*, *10*(4), 1–14. https://doi.org/10.1371/journal.pone.0124162

Wibawa, I. G. N. A., dan Luthfi, O. M. (2017). Kualitas Air Pada Ekosistem Terumbu Karang Di Selat Sempu, Sendang Biru, Malang. *Jurnal Segara*, *13*(1), 25–35. https://doi.org/10.15578/segara.v13i1.6420

Widiawaty, M. A., Ismail, A., dan Dede, M. (2020). The impact of Cirebon coal-fired power plants on water quality in Mundu Bay , Cirebon Regency. *Sustinere*, *4*(3), 189–204. https://doi.org/doi.org/10.22515/sustinere.jes.v4i3.114

Williams, S. M. (2020). *The control of algal abundance on coral reefs through the reintroduction of Diadema antillarum* (Vol. 2020).

Williams, S. M., Sánchez-Godínez, C., Newman, S. P., dan Cortés, J. (2017). Ecological assessments of the coral reef communities in the Eastern Caribbean and the effects of herbivory in influencing coral juvenile density and algal cover. *Marine Ecology*, *38*(2), 1–10. https://doi.org/10.1111/maec.12395

Wiyanto, D. B. (2016). Coral Reef Coverage Percentage on Binor Paiton-Probolinggo Seashore. *Journal of Marine and Aquatic Sciences*, *2*(1), 6. https://doi.org/10.24843/jmas.2016.v2.i01.6-10

Wiyanto, D. B. (2019). *Prosentase Tutupan Terumbu Karang Di Perairan Pantai Binor Paiton-Probolinggo*. *0361*, 1–8. https://doi.org/doi.org/10.24843/jmas.2016.v2.i01.6-10

Woodhead, A. J., Graham, N. A. J., Robinson, J. P. W., Norström, A. V, Bodin, N., Marie, S., Balett, C., dan Hicks, C. C. (2021). Fishers perceptions of ecosystem service change associated with climate- - disturbed coral reefs. *People and Nature*, *3*, 639–657. https://doi.org/10.1002/pan3.10220

Ye, Z., Mayfield, A. B., dan Fan, T. (2023). Variable Responses to a Marine Heat Wave in Five Fringing Reefs of Southern Taiwan. *MDPI*, *13*. https://doi.org/https://doi.org/10.3390/app13095554

Yonar, M., Luthfi, O. M., dan Isdianto, A. (2021). Dynamics Of Total Suspended Solid (TSS) Around Coral Reef Beach Damas, Trenggalek. *Journal of Marine and Coastal Science*, *10*(1), 48. https://doi.org/10.20473/jmcs.v10i1.25606

Zhao, H., Yuan, M., Strokal, M., Wu, H. C., Liu, X., Murk, A. T., Kroeze, C., dan Osinga, R. (2021). Impacts of nitrogen pollution on corals in the context of global climate change and potential strategies to conserve coral reefs. *Science of the Total Environment*, *774*, 145017. https://doi.org/10.1016/j.scitotenv.2021.145017

Zulfikar, Yasin, Z., Hwai, A. T. S., dan Ern, N. J. (2015). Coral recruitment before and after bleaching event 2010 in Pulau Weh, Aceh, Indonesia. *Acta Aquatica*, *2*(1), 70–74. https://doi.org/doi.org/10.29103/aa.v2i1.356

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GADJAH MADA
Penilaian Resiliensi Terumbu Karang pada Perairan di Sekitar Pembangkit Listrik Tenaga UAP (PLTU) Paiton, Kabupaten Probolinggo
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Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Zurba, N. (2019a). Pengenalan Terumbu Karang Sebagai Pondasi Utama Laut Kita. *Unimal Press*, *August*, 128.

Zurba, N. (2019b). Pengenalan Terumbu Karang Sebagai Pondasi Utama Laut Kita. In *Unimal Press*.

Zvifler, A. Z., Leary, M. O., dan Morgan, K. (2021). Turbid Coral Reefs : Past , Present and Future — A Review. *MDPI*, *13*(251), 1–23.