

RINGKASAN

MUHAMMAD NAUFAL ALAFIF. Status Mutu Perairan berdasarkan Indeks Pencemaran (IP) di Perairan Tanjung Uban Kabupaten Bintan. Dibimbing oleh WINNY RETNA MELANI dan TRI APRIADI.

Tanjung Uban merupakan salah satu kelurahan yang terletak di Kecamatan Bintan Utara, Kabupaten Bintan. Wilayah pesisir ini dicirikan oleh kepadatan permukiman penduduk serta tingginya aktivitas lalu lintas kapal, yang berpotensi menimbulkan pencemaran dan penurunan kualitas perairan, baik secara langsung maupun tidak langsung. Penelitian ini bertujuan untuk menganalisis kondisi kualitas perairan serta menentukan nilai indeks pencemaran di perairan Tanjung Uban, Kabupaten Bintan. Selain itu, penelitian ini untuk mengetahui besar kontribusi hubungan parameter kualitas air terhadap pembentukan komponen utama menggunakan *Principal Component Analysis* (PCA). Penelitian dilaksanakan pada bulan Desember 2025 dengan menggunakan metode *systematic random sampling* penentuan titik sampling secara acak sebanyak 15 titik. Pengambilan sampel dilakukan pada dua kondisi, yaitu saat pasang dan surut, dengan bantuan perangkat lunak Quantum GIS untuk penyebaran titik secara acak di perairan Tanjung Uban. Pengukuran parameter fisika, kimia, dan biologi dilakukan secara *in situ* dan *ex situ*. Hasil penelitian menunjukkan bahwa parameter suhu, kekeruhan, pH, DO, kecerahan, TSS, BOD, dan *coliform* masih berada dalam batas baku mutu berdasarkan Peraturan Pemerintah Nomor 22 Tahun 2021 Lampiran VIII untuk peruntukan biota laut. Nilai indeks pencemaran pada kondisi pasang sebesar 1,155 dan pada kondisi surut sebesar 1,080, yang keduanya termasuk dalam kategori tercemar ringan. Hasil analisis PCA menunjukkan bahwa terdapat beberapa parameter air seperti kekeruhan, suhu, kecerahan, TSS, kecepatan arus, DO, pH, BOD, *coliform* yang berperan dominan dalam memengaruhi variasi kualitas air dan nilai indeks pencemaran di perairan Tanjung Uban. Berdasarkan temuan tersebut, diperlukan upaya kolaboratif antara pemerintah dan masyarakat dalam pengelolaan wilayah pesisir secara berkelanjutan guna mencegah peningkatan pencemaran. Upaya tersebut dapat dilakukan melalui pengelolaan sampah yang efektif, penyediaan fasilitas sanitasi yang memadai, pengolahan limbah rumah tangga yang tepat, serta peningkatan kesadaran masyarakat melalui edukasi lingkungan. Selain itu, diperlukan pula dukungan penelitian lanjutan, pengembangan teknologi, serta kerja sama dengan organisasi non-pemerintah dalam pelaksanaan program restorasi lingkungan pesisir. Secara keseluruhan, kondisi perairan Tanjung Uban berdasarkan nilai indeks pencemaran tergolong dalam kategori tercemar ringan.

Kata kunci : Indeks pencemaran, Kualitas air, Tanjung Uban

SUMMARY

MUHAMMAD NAUFAL ALAFIF. Water Quality Status based on Pollution Index (IP) in Tanjung Uban Waters, Bintan Regency. Supervised by WINNY RETNA MELANI and TRI APRIADI.

Tanjung Uban is a sub-district located in North Bintan District, Bintan Regency. This coastal area is characterized by dense population and high ship traffic activity, which has the potential to cause pollution and water quality degradation, both directly and indirectly. This study aims to analyze water quality conditions and determine the pollution index value in the waters of Tanjung Uban, Bintan Regency. In addition, this study aims to determine the extent of the contribution of the relationship between water quality parameters to the formation of the main components using Principal Component Analysis (PCA). The study was conducted in December 2025 using a systematic random sampling method, randomly determining 15 sampling points. Sampling was carried out under two conditions, namely high tide and low tide, with the assistance of Quantum GIS software for random distribution of points in the waters of Tanjung Uban. Measurements of physical, chemical, and biological parameters were carried out in situ and ex situ. The results showed that the parameters of temperature, turbidity, pH, DO, clarity, TSS, BOD, and coliform were still within the quality standards based on Government Regulation Number 22 of 2021, Appendix VIII for the designation of marine biota. The pollution index value at high tide was 1,155 and at low tide it was 1,080, both of which are categorized as lightly polluted. The results of the PCA analysis indicate that several water parameters such as turbidity, temperature, clarity, TSS, current velocity, DO, pH, BOD, and coliform play a dominant role in influencing variations in water quality and the pollution index value in the waters of Tanjung Uban. Based on these findings, collaborative efforts are needed between the government and the community in sustainable coastal area management to prevent increased pollution. These efforts can be carried out through effective waste management, the provision of adequate sanitation facilities, proper household waste processing, and increasing public awareness through environmental education. In addition, support for further research, technology development, and collaboration with non-governmental organizations in implementing coastal environmental restoration programs are also needed. Overall, the condition of the waters of Tanjung Uban is categorized as lightly polluted based on the pollution index value.

Keywords: Pollution index, Tanjung Uban, Water quality