3.11.2 Maximum temperature trends

Table 7 presents decadal maximum temperature trends for Ilaje LGA coastal waters between 1996 and 2025. The data show a gradual increase in mean maximum temperatures: 32.6°C in Decade 1 (1996-2005), rising to 33.3°C in Decade 2 (2006-2015), and stabilizing at 33.2°C in Decade 3 (2016-2025). This pattern reflects modest but consistent warming, with occasional fluctuations such as lower values (31°C) in Decade 3 and higher peaks (34°C) in decades 2 and 3. These findings align with broader climatic observations. Faweya et al. (2023) reported increasing rainfall intensity and high temporal variability in Ondo State, indirectly linked to rising temperatures that influence atmospheric circulation. Although their study did not break down data by LGA, the warming trend observed in Ilaje is consistent with regional patterns. Similarly, Ikezam et al. (2025), in a GIS-based study of wetland changes in Ilaje, highlighted how land use and climate variability, including temperature increases, affect wetland dynamics and fisheries.

The gradual rise in maximum temperatures also mirrors national climate records, which show steady warming across Nigeria's coastal zones. Such warming has implications for fisheries, as higher water temperatures alter breeding cycles, oxygen levels, and species distribution. As Omitoyin et al. (2021b) noted, temperature fluctuations in Ilaje contribute to declining fish productivity and shifts in species dominance, underscoring the need for adaptive strategies.

3.11.3 Minimum temperature trends

Table 8 highlights decadal minimum temperature trends in Ilaje LGA, showing a gradual warming pattern typical of tropical coastal regions. The mean minimum temperature rose from 19.6°C in Decade 1 (1996-2005) to 19.9°C in Decade 2 (2006-2015), and further to 21.3°C in Decade 3 (2016-2025). The lowest recorded value was 19°C, while the highest was 23°C in Decade 3, Year 3. This steady increase reflects regional warming influenced by global climate change, urbanization, and land-use changes. These findings align with Faweya et al. (2023), who reported increasing rainfall intensity and climate variability in Ondo State, indirectly linked to rising temperatures. Similarly, Ikezam et al. (2025) noted that warming trends and land-use change significantly affect coastal ecosystems in Ilaje. The observed rise in nighttime temperatures is consistent with global climate records, which show warming across West Africa's coastal zones (Odjugo, 2010).

Environmental implications are significant. Rising temperatures exacerbate coastal erosion, saltwater intrusion, and biodiversity loss, directly impacting Ilaje's fishing and farming livelihoods. As Omitoyin et al. (2021b) observed, temperature fluctuations disrupt fish breeding cycles and reduce productivity. Higher nighttime temperatures also affect crop viability and pest behavior. These trends underscore the urgent need for climate adaptation strategies, including coastal monitoring, early warning systems, and resilient infrastructure.

3.11.4 Effects of water level on fish catch volume in Ilaje coastal waters

Table 8 illustrates fishermen's consensus in Ilaje LGA that water level fluctuations critically influence fish catch volumes. Nearly all respondents (98.6%) affirmed that high water levels expand aquatic habitats, enhance oxygenation, and facilitate breeding, consistent with findings that seasonal flooding improves fish productivity by connecting breeding grounds and dispersing nutrients (Welcomme, 2011). Conversely, 97.5% reported that low water levels reduce oxygen, elevate temperatures, and restrict fish movement, echoing evidence of dry-season water stress leading to reduced catches and higher mortality (Idogho et al., 2022b).

Changes in river flow were also emphasized, with 86.8% acknowledging impacts on fish availability and 85.7% noting significant declines attributed to climate change, deforestation, and urban encroachment. Similar disruptions have been documented in southeastern Nigeria (Nnaji and Nzeadibe, 2023) and across coastal ecosystems (Globally, climate-driven hydrological changes have reduced nutrient cycling and fish productivity (Cohen et al., 2016). These findings highlight the urgent need for adaptive water management, sustainable fisheries practices, and ecosystem conservation to safeguard livelihoods in Ilaje.