RC1 – Anonymous Reviewer

Reviewer Comment	Author Response	Changes Made in Manuscript
Abstract mentions wind and water temperature, but no data is presented (lines 13, 371–384).	These mentions were intended to highlight their role as drivers of the hydrodynamic cycle and phytoplankton biomass, without implying causal links.	
Validation with in-situ data is recommended to support satellite Chl-a observations.	We agree that validation with in-situ measurements is important in principle. However, long-term in-situ Chl-a data covering the entire lake over the 20-year period are not available. Most in-situ measurements were limited to short-term, nearshore studies and cannot provide a lake-wide validation of the satellite dataset.	
Implication for other studies unclear.	Our study provides a comprehensive view of surface phytoplankton seasonality over 20 years, useful for ecological and fisheries research.	Clarified implications in the Discussion: results provide baseline for future studies on phytoplankton dynamics and fisheries ecology.
Duplicated section 3.2 numbering.	Thank you for noticing. Sections will be renumbered.	Reorganized and renumbered sections to eliminate duplication.
Language issues (lines 50, 88, 94, 119).	Will revise for clarity and consistency.	Revised manuscript text for clarity and style, including correcting the specific examples highlighted.

RC2 – Anonymous Reviewer

Reviewer Comment	Author Response	Changes Made in Manuscript
Bathymetry map scale insufficient to illustrate depth and slope variations.	Agreed; the map scale was adjusted to better show variations in key depth intervals (<170 m, 0–40 m, 250 m).	Figure 1 updated to improve visualization of depth variations; Gulf of Burton and main cities added for context.
Methodological framework could be improved (divide lake by depth, grid, then analyze Chl-a).	Our approach evaluates Chl-a at pixel level first, then clusters by temporal covariance, which allows a data-driven characterization independent of depth.	Sections 2.4–2.6 merged into **"Analysis Methods for Seasonal and Interannual Variations of Chlorophyll-a"**. Section 2.7 renamed **"Partition and Shifts in Chl-a Distribution"**.
Missing data handling unclear.	DINEOF interpolation used; applied only to areas observed at least once and dates covering ≥5% of lake surface.	
Suggest enlarging April and October/Nov panels in Figure 2.	Decided to maintain overall layout to preserve readability, but clarified key regions in text and added context.	Figure 2 maintained;
Section 3.3 – only relative trends shown; absolute magnitudes and p-values missing.	Maps will be provided in Supplementary Materials to avoid overcrowding main text.	Supplementary Figures added showing absolute trends. Only significant trends are shown (p-values <1%)
Discussion on high Chl-a areas lacks clarity.	Most high Chl-a areas are located in shallow waters. Among these shallow regions, some areas showing high Chl-a are neither near major river estuaries nor close to urban centers. The analysis remains descriptive, as the underlying causes of these patterns are not fully understood.	Discussion revised accordingly
Figure 4 indicates that except for the 7th shallow water cluster, the seasonal variations of chlorophyll-a in the other several clusters do not	We acknowledge that Cluster 7 shows unclear seasonal patterns, but the remaining six clusters display three distinct seasonal phases: April–September, October–December, and December–April. This supports the three-season framework derived from remote sensing observations.	Discussion revised to clearly explain the seasonality in the different clusters of the lake and link it with the hydrodynamic cycle.

show results consistent with a three-season framework.		
Incorrectly linked Chl-a to primary productivity.	Chl-a reflects phytoplankton biomass, not direct productivity; productivity/fish yields depend on multiple factors.	Corrected text to describe Chl-a as a biomass indicator;

CC1

Reviewer Comment	Author Response	Changes Made in Manuscript
The use of “shallow” and “deep” is misleading; terminology for Chl-a levels may not be appropriate	Terms “shallow” and “deep” revised to “shallower” and “deeper” zones based on depth, not proximity to shore. “High” and “low” Chl-a replaced with “higher” and “lower” to reflect relative concentrations in this oligotrophic lake.	Terminology revised throughout manuscript; discussion updated to
Lines 34–46: Add more recent citations.	Recent citations added to strengthen introduction.	Introduction updated with recent references.
Lines 115–135: Suggest moving to introduction or discussion.	Section retained in Study Site to maintain logical flow; general context in introduction followed by detailed lake characteristics in Study Site section.	Section 2.1 Study Site retained; introduction clarified for context.
Line 144: “Data gaps 2012–2016 due to validation issues.”	Revised to indicate MODIS data for 2012–2016 were not released for Lake Tanganyika.	Sentence updated in manuscript.
Line 155: “95% missing values.”	DINEOF requires a minimum of 5% available pixels; low availability images show patchy coverage, not scattered pixels.	.
Lines 417–430: Statements about “eutrophication” and wind-driven Chl-a.	The term eutrophication does indeed not apply to Lake Tanganyika, because of the very low levels of Chl-a.	Term eutrophication removed.
Lines 423–425: Peak productivity following wind-driven mixing events.	Revised to indicate that peak Chl-a concentrations occur during periods of strong winds; precise timing of mixing events not determined without wind datasets.	Discussion revised to reflect interpretation without implying causation.

CC2

Reviewer Comment	Author Response	Changes Made in Manuscript
Lack of link between Chl-a patterns and lake hydrodynamics	Discussion revised to highlight how hydrodynamics influence seasonal Chl-a patterns.	Discussion updated
Line 50: Missing citation of Horion et al., 2010 for Lake Tanganyika remote sensing.	Horion et al., 2010 added as citation.	Reference added in manuscript.
Line 104: Missing reference for “water is clear and nutrient levels low.”		Added reference on Seechi Disk depth
Line 431: “Cascading effects” statement too strong regarding food web.		Conclusion rewritten to be more cautious on implications of decreasing of increasing phytoplankton concentrations levels