Table S1: Macro climatic variables related to flow variability.

Macroclimatic Variables	Description	Type	Location
1. AMM: Atlantic Meridional Mode	Derived from the Maximum Covariance Analysis (MCA) of SST and 10-meter wind field.	Oceanic-Atmospheric	Atlantic
2. AMO: Atlantic Multidecadal Oscillation	SST anomaly averaged over 0°-60° N, 0°-80° W minus the SST averaged over 60° S-60° N.	Oceanic	Atlantic
3. CAR: Caribbean Index	SST anomaly over the Caribbean.	Oceanic	Atlantic
4. NAO: North Atlantic Oscillation	Anomaly of a dipole in the SST of the North Atlantic.	Oceanic	Atlantic
5. NTA: North Tropical Atlantic SST Index	SST anomaly in the ranges 60° W-20° W, 6° N-18° N, and 20° W-10° W, smoothed using a three-month moving average and projected onto 20 main EOFs.	Oceanic	Atlantic
6. TNA: Tropical North Atlantic Index	SST monthly anomaly averaged over 5.5° N to 23.5° N and 15° W to 57.5° W.	Oceanic	Atlantic
7. TSA: Tropical South Atlantic Index	SST monthly anomaly averaged over Eq-20° S and 10° E-30° W.	Oceanic	Atlantic
8. BEST: Bivariate ENSO Time Series	Standardized combination of the SOI and Niño 3.4 SST.	Oceanic-Atmospheric	Pacific
9. ENSO: ENSO Precipitation Index	Time series using tropical Pacific precipitation data to describe ENSO events.	Atmospheric	Pacific
10. MEI: Multivariate ENSO Index	Combined EOF (Empirical Orthogonal Function) of five variables: pressure, SST, wind, and longwave radiation (zonal and meridional components).	Oceanic-Atmospheric	Pacific
11. NP: North Pacific Pattern	Sea-level pressure anomaly weighted over the 30° N-65° N, 160° E-140° W region.	Atmospheric	Pacific
12. ONI: Oceanic Niño Index	Three-month moving average of SST anomaly in the Niño 3.4 region, based on a 30-year baseline.	Oceanic	Pacific
13. PDO: Pacific Decadal Oscillation	Monthly SST anomaly in the North Pacific Ocean, from 20°N to the pole.	Oceanic	Pacific

14. QBO: Quasi-Biennial Oscillation	Zonal mean wind at 30 mb altitude near the equator (tropical stratosphere).	Atmospheric	Pacific
15. SOI: Southern Oscillation Index	Difference in atmospheric pressure between Tahiti and Darwin.	Atmospheric	Pacific
16. TNI: Trans Niño Index	Standardized difference between T-Niño 1+2 and T-Niño 4, smoothed using a 5-month moving average and standardized over the 1950-1979 period.	Oceanic	Pacific
17. WP: Western Pacific Index	Low-frequency variability over the North Pacific.	Oceanic	Pacific
18. T-Niño 1+2: SST in Niño 1+2 region (NINO12)	SST anomaly in the Eastern Tropical Pacific (0°-10° S, 90° W-80° W).	Oceanic	Tropical Pacific
19. T-Niño 3: SST in Niño 3 region (NINO3)	SST anomaly in the Central Tropical Pacific (5° N-5° S, 150° W-90° W).	Oceanic	Tropical Pacific
20. T-Niño 3.4: SST in Niño 3.4 region (NINO34)	SST anomaly between Niño 3 and Niño 4 regions (-5° S-5° N, 170° W-120° W).	Oceanic	Tropical Pacific
21. T-Niño 4: SST in Niño 4 region (NINO4)	SST anomaly in the Western Pacific (5° N-5° S, 160° E-150° W).	Oceanic	Tropical Pacific