Anish Aniket Mahanta
Bengaluru, Karnataka, India | /*aam11* | /*aam11*

Professional Summary

Atmospheric scientist and data engineer with **5+ years** building production reanalysis and forecast data pipelines for wind-energy and climate-risk applications. Hands-on with **ECMWF** (ERA5), **NASA** (MERRA-2), and **NOAA** datasets across **NetCDF**, **GRIB/GRIB2**, and **Zarr**; numerical weather prediction (**WRF**, **HYSPLIT**); and ML-based bias correction (LSTM, CNN). M.Sc. Atmosphere & Ocean Sciences (IIT Bhubaneswar). Tracks AI-based weather forecasting and applies it to hazard and wind-resource modelling; mentors teams on weather and climate fundamentals and translates scientific output into operationally reliable products.

Core Skills

Programming & Data: Python (Advanced), R (Advanced), SQL, MATLAB (Intermediate), Power BI
Scientific & Statistical Computing: pandas, numpy, xarray, dask, netCDF4, cfgrib, scipy, statsmodels; R `forecast` / `tidyverse`
Weather & Reanalysis Data: ECMWF (ERA5, ERA5-Land), NASA (MERRA-2), NOAA (GFS), IMD; NetCDF, HDF5, GRIB/GRIB2, Zarr
Numerical Weather Prediction & Forecast Analysis: Weather Research and Forecasting (**WRF**), **HYSPLIT**; radar interpretation, satellite imagery, METAR decoding, BUFKIT soundings
AI / ML for Weather: ML-based bias correction (LSTM, CNN), Kriging downscaling; tracks AI-based NWP developments
GIS & Remote Sensing: ArcGIS, QGIS, GDAL, Climate Data Operator (CDO), NCO
Data Engineering & DevOps: BigQuery, Google Cloud CI/CD, Docker, Git, Plumber, REST/Swagger, Postman
Visualization & Reporting: Plotly, Leaflet, ggplot2, R Shiny, Windographer
AI Tooling: GitHub Copilot, Claude (Claude Code), ChatGPT
Languages: English (professional), Hindi (native), Odia (fluent), French (beginner)

Work Experience

Wind and Climate Data Analyst | *Wind Pioneers* *Dec 2022 – Present*

- Author and sole maintainer of a **reanalysis data library** — Python library, CLI and packaged EXE serving **ECMWF ERA5** and **NASA MERRA-2** reanalysis over **zarr-on-GCS**, **BigQuery** and NAS NetCDF providers, with a **refuse-on-missing-timestamps completeness standard**.
- Built the **ERA5 (Copernicus CDS)** and **MERRA-2 (NASA GES DISC) acquisition pipelines** — scheduled unattended runs with integrity gates and failure alerting, **degrading gracefully when upstream feeds truncate or lag**.
- **Site-specific wind-resource and hazard analysis reports** for project **feasibility and due diligence** — cyclone-exposure assessment and reanalysis sanity checks across ERA5 and MERRA-2.

Climate Modeling Analyst → **Senior Associate** | *Genesis Ray Energy* *Feb 2021 – Dec 2022*

- Supervised a 2–3 person Climate Science team cross-validating **ML/DL and statistical bias-correction models** for weather and climate data and running them **in production on Azure**, with monitoring and retraining.
- Led migration of the Climate Science codebase to Microsoft Azure; developed **solar hindcast models** in R for variability and site-suitability analysis.

Education

M.Sc. in Atmosphere and Ocean Sciences | *Indian Institute of Technology, Bhubaneswar, Odisha* | *CGPA : 7.56* *2018 – 2020*
B.Sc. in Geology | *St. Xavier's College, Ranchi, Jharkhand* | *Percentage : 78.75%* *2013 – 2016*

Projects

Extreme-wind statistics toolkit *Dec 2025 – Jun 2026*

- Co-developed a production library for offshore **extreme-wind statistics** — **Holland 1980** typhoon wind fields from **IBTrACS** tracks, and **EWTS / MIS / block-maxima return-period** methods.

High Resolution Atmospheric Dataset *Oct 2022*

- Built **LSTM/CNN bias-correction** lifting **forecast precision 18%**, and applied **CNN + Kriging spatial downscaling** of climate projections for scenario modelling, visualisation, and interpretation.

NetCDF Maker *Dec 2022*

- R Shiny app for converting sensor-level CSV data to NetCDF, enabling exchange with NWP and reanalysis workflows.

Research

Long-Term Changes in the Intra-seasonal Modulation of Extreme Rainfall over India | *Master's Thesis Project* *May 2020*
Kalman Filter Implementation | *High Performance Computing Class Project* *May 2020*

Field Experience

Data Collection and Assimilation | *National Atmospheric Research Laboratory (NARL), Gadanki* *2019*
Ocean Data Retrieval Techniques | *Indian National Center for Ocean Information Services (INCOIS), Hyderabad* *2019*
Extreme Weather and Climate Analysis | *Indian Meteorological Department (IMD), Bhubaneswar* *2018*

Awards and Certifications

AIR 117 | *IIT JAM* *March 2018*