CS732/DS732: Data Visualization -- Datathon 1

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Announcement: August 28, 2020, 11:59 pm IST
Submission: August 31, 2020, 11:59 pm IST on LMS

Dataset:

Source and description: 5-day moving average of values computed of Indian Ocean from the ocean model MOM, run by the Indian National Center for Ocean Information Services, INCOIS, Hyderabad. The data source is https://las.incois.gov.in/las/UI.vm under "Ocean Analysis" and "5-day ice". Available at:
https://drive.google.com/drive/folders/1F0lLu4m_6tMBw5Ba1GGYY4pU8C2gFCFf?usp=sharing

Metadata: The dataset consists of 5 folders, each for different variables, namely, sea surface salinity (SSS), sea surface temperature (SST), sea surface height anomaly (SSHA), meridional current, and zonal current, during the period December 2003 – December 2005. The datasets are at 5-day interval, thus giving 147 timesteps. Each of the folders also has a screenshot of the web-page giving latitude-longitude ranges of each variable.

The datasets for SSS, SST, and SSHA have data for 187 longitudes ranging in [29.8892W, 119.8237W], and 188 latitudes ranging in [29.7511S, 29.7511N]. Thus, each data file for a time-stamp has 187*188=35156 scalar values.

The zonal and meriodional current values can be treated as a single 2-dimensional vector field, where, zonal current speed (east-to-west speed, along latitude) can be assumed to be u- (or x-) component, and meridional current speed (north-to-south speed, along longitude), as v- (or y-) component. The datasets for current values have data for 181 longitudes ranging in [30W, 120W], and 189 latitudes ranging in [30.0005S, 30.0005N]. Thus, each data file for a time-stamp has 181*189=37209 scalar values in each file.

Indicative Tasks:

Generate scalar field visualizations using contour mapping, color mapping, elevation mapping.
Generate vector field visualizations using quiver plots (and optionally, streamlines).

Questions to answer:
1. Did the ocean variables reflects changes after the 2004 Indian Ocean tsunami on December 29, 2004?
2. Did any ocean variables reflect the tsunami effects itself even though we don't have data for the exact day?
3. As an informed citizen of the country, what did you learn about the Indian Ocean based on this dataset? Hint: spatial patterns, temporal patterns related to monsoons.
***Be as creative and as curious as you can*.**

Report:

Your report must contain images and text to say the following;
1. which parts of the dataset were you able to use, and how have you been able to use – the more you use the merrier.
2. which visualizations did you choose, why, what technologies (Python libraries, others) did you use for the visualizations,
3. your inferences.