SECOORA Data Portal Exercises

Exercise #1: April 2018- Carolina Storm using Historic Real-time Sensor
Exercise #2: Exploration of Data Trends for Estuarine Fish Abundance and Sea Surface Temperature

Exercise #1a: Carolinas April 2018 Storm

The tornado outbreak of April 13–15, 2018 was a multi-day and significant tornado outbreak that affected portions of the Midwest across to the East Coast. This particular outbreak led to at least 70 confirmed tornadoes over a 2-day period. One of the most significant tornadoes impacted eastern portions of the Carolinas on April 15. Using historic data from real-time sensors, can you determine what the coastal conditions were in the Charleston region during that time?

Complete exercise 1a. as a guided exercise with instructor.

Steps	Instructions
1. Open portal	● Go to https://portal.secoora.org/
2. Go to "SECOORA Historical Sensors".	● Click on Catalog or SEARCH 2300+ DATASETS icons. ● Search for "SECOORA Historical Sensors". ● Click Add to map. ● In the Legend, remove the "SECOORA Real-Time Sensors" layer. ● Alternatively: Click HERE for a short cut navigation.
3. Search for Charleston weather station.	● On the map, zoom into the Charleston area. ● Beneath Sensor type menu, uncheck "Show All". ● From the Sensor type menu, select "Winds: Speed and Direction". ● Pro tip: type the key term "Charleston" into the search box in the real-time sensor layer for quicker exploration.
4. Open the NOAA CO-OPS Charleston, SC station.	● Click on the station point to open the data chart.
5. Add Winds:Speed & Direction to a new data view.	● Click on the data view menu ★. ● Click on the + icon to create a new data view. ● Type "April 2018 storm test" in the data view label box. ● Then, click + to save the new data view. The name of your new data view will now be shown in the list. ● Check both boxes: ☐ ★ Save to data view & ☐ Add to compare chart.
7. Add Winds:Speed & Direction from the UNCW-CORMP CAP2 mooring Capers Nearshore (offshore from	● Click to open the station. Make sure "Winds:Speed & Direction" is selected as the sensor type from the data chart upper menu.

Charleston).	● Click on the data view menu ★▾. ● Beneath “April 2018 storm test”, check both boxes (as shown above).
8. Add Barometric Pressure from the UNCW-CORMP CAP2 mooring.	● With the data chart open, toggle the upper menu to “Barometric Pressure”. ● Click on the data view menu ★▾. ● Beneath “April 2018 storm test”, check both boxes (as shown above).
9. Open your data view.	● Click on the data view name (“April 2018 storm test”) to open it from the station view, or click ★ Data views 5 in the upper toolbar and select the name.
10. Identify Hurricane Matthew signature.	● In the comparison chart, note the passing of Hurricane Matthew on October 11.
11. Set the comparison chart time range from April 14 to 17 2018 to look for the tornado event using historic data.	● Click ⚙ at the x/y intersection to open the chart settings. ● Click the time range box to open the calendar. ● Click the start & end dates on the calendar, or adjust using the date boxes. ● Select “Apply”.
12. Adjust the seasonal statistics.	● Click ⚙ from the sensor list legend beneath the comparison chart for the Charleston Winds:Speed and Direction. ● Add or remove any statistics to customize your view.
13. Add a narrative to your data view.	● Click the gear from + ⚙ near the top right corner of the page. ● In the popup window that appears, enter your description in the Description box. ● Pro tip: Your description can include valid HTML, which allows you to add links and images as well as some basic text formatting.
14. Share your custom view.	● Click Share in the upper toolbar. A custom link will appear that can be copied, pasted, and shared with others.
15. Save your data view	● The data view is cached in your browser and will remain under your ‘Data Views’ menu while using the same computer. ● To delete your data view, click the + from + ⚙ and select ‘Delete’.

Complete exercises 1b. and/or 1c. on your own.

Exercise #1b: Carolinas April 2018 Storm- Offshore

What was the maximum wave height reported 40 nm offshore of Charleston during that storm event?

Steps	Instructions
1. Navigate to the map from your data view.	● Select Map 1 in the upper toolbar.
2. Find Waves: Height and Direction from the Edisto buoy (40 NM Southeast of Charleston).	● Mouse over the stations to find the station name, or type "Edisto" in the search box in the historical sensor layer (e.g. beneath the Platform menu). ● Click on the station point to open the data chart. ● With the chart menu open, select "Waves: Height and Direction" from the upper drop down list.
3. Add Waves: Height and Direction to the "April 2018 storm test" data view.	● Click on the data view menu ★. ● Beneath "April 2018 storm test", check boxes: ☐ ★ Save to data view & ☐ Add to compare chart.
4. Open your data view.	● Click on the "April 2018 storm test" data view name to open it from the station view, or click ★ Data views 5 in the upper toolbar and select it.
5. Adjust the seasonal statistics and determine the maximum value.	● Click ⚙ from the sensor list legend beneath the comparison chart for the Edisto: Waves: Height and Direction. ● Using the mouse hover, determine the maximum wave height value. ● Add or remove any statistics to customize your view.

Exercise #1c: Carolinas April 2018 Storm- Precipitation

How much rain fell during that storm in the greater Charleston region? And, how many weeks in the past year experienced a greater amount of rainfall than during that storm?

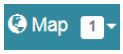
Steps	Instructions
1. Navigate to the map from your data view.	● Select Map 1 in the upper toolbar.
2. Find Precipitation from the Savannah River station at Fort Pulaski and open it.	● Select "Precipitation" from the Sensor types menu and mouse over the stations to find the station name. Or, select "Precipitation" from the Sensor types menu and type "Fort Pulaski" in the search box in the real-time sensor layer (e.g. beneath the Platform menu). ● Click on the station point to open the data chart. ● With the chart menu open, make sure "Precipitation" is selected from the upper drop down list.

3. Add Precipitation to the “April 2018 storm test” data view.	● Click on the data view menu ★▾. ● Beneath “April 2018 storm test”, check boxes: ☐ ★ Save to data view & ☐ Add to compare chart.
4. Open your data view.	● Click on the “April 2018 storm test” data view name to open it from the station view, or click ★ Data views 5 in the upper toolbar and select it.
5 Determine the maximum rainfall during the storm.	● Using the mouse hover, determine the maximum rainfall value. ● Add or remove any statistics to customize your view.
6. Create an anomaly chart from May 2017 to May 2018 to determine how many weeks had greater rainfall.	● Using the saved charts on the right for Savannah River at Fort Pulaski station, toggle the Chart type to select “Anomaly” from the drop down list. (Note: Time bin should be set to “Auto”). ● Click ⚙ at the x/y intersection to open the chart settings. ● Click the time range box to open the calendar. ● Select “Past 365 days” from the default time periods. ● Select “Apply”. ● Using the mouse hover, count the number of weeks that had relatively greater rainfall than the April 15-22 period.

Exercise #2: Exploration of Data Trends for Estuarine Fish Abundance and Sea Surface Temperature

The Fisheries-Independent Monitoring, Assessment, and Prediction (FIMMAP) project data layer contains monitoring information from 2009 to 2012. This project involved data collection and biological samples used for Fisheries Independent Monitoring (FIM) research projects on estuarine fish species, populations, and communities. In this example, potential trends in fish abundance and diversity will be explored using virtual sensor data from the GHRSST sea surface temperature model.

Steps	Instructions
1. Open portal	● Go to https://portal.secoora.org/
2. Go to catalog	● Click on Catalog or SEARCH 2300+ DATASETS icons.
3. Search for “SECOORA Fisheries and Wildlife Monitoring” data module and add it to the Map.	● This data module can be found in two ways: ○ Type “SECOORA Fisheries and Wildlife Monitoring” into the Search text box. ○ Or, select the “Marine Species” label from the list to the right and browse to find the module. ● Click on the module name in the catalog to open it. ● There are 2 data layers associated with this module. ● Under the “Fisheries-Independent Monitoring, Assessment, and Prediction (FIMMAP)” layer, click Add to map ✚.

	● Then, open  in the upper toolbar.
4. Remove the SECOORA Historical Sensor data layer.	● The SECOORA Historical Sensor layer was already loaded in the Map from exercise #1. To remove it, click the  to the right of the name in the legend.
5. Zoom to layer extent.	● Zoom to layer extent by clicking  to the right of the FIMMAP name in the right-hand legend. ● Data from most biological observations are aggregated into hexagonal bins to visually summarize data over a large spatial area when the map is zoomed out. The color of the hexagon represents the average value of the selected data parameter within that hexagon. For example, if count or abundance is the selected parameter, then the hexagon color will reflect the average count of all individuals or observations within that bin. Try these different capabilities for this data layer: ○ To view a summary of all the observation data contain within a hexagon, hover over the hexagon. If you click on the hexagon, a data display window will appear showing a histogram chart summarizing the data. ○ To change the data parameters in the map, the filters can be used in the legend on the right side. The filters include many different biodiversity index types (e.g. species richness, diversity, abundance, etc). ○ To view data for an individual location or observation, zoom in on the map. The hexagons will soften into points that represent the individual sample locations or observations that were aggregated into that hexagon.
6. Using the polygon tool, create summary statistics for the north area of the dataset around Bradenton, FL.	● Zoom in on the map until the hexagons dissolve into points. ● In the Measurement filter, select “Count per 10m2”. ● Click on the polygon tool  icon. Draw an approximate polygon on the map for the northern extent of the dataset from Bradenton to north of the Sarasota airport using mouse clicks at each corner or bend in your shape. When you’re finished drawing, double-click to complete the shape. ● A data display window will open showing a summary chart of the data within the polygon. Beneath the data layer title at the top of the data display window, the number of observations contained within the polygon will be shown.
7. Add the summary statistics to	● Click on the data view menu  .

a new Data View.	● Click on the + icon to create a new data view. ● Type “FIMMAP test” in the data view label box. ● Then, click + to save the new data view. The name of your new data view will now show in the list. ● Check both boxes: ☐ ★ Save to data view & ☐ Add to compare chart.
8. Add the GHRSST Sea Surface Temperature (.01deg/1km) model to the Map.	● In the map legend click on Find Data. ● Type the key term “sea surface temperature” into the search box. ● Select Add to map + for the GHRSST Level 4 MUR Global Foundation Sea Surface Temperature Analysis (.01deg/1km) layer.
9. Change global model color scale to data in view.	● Navigate back to the Legend. ● Click on the color legend bar for the Sea Surface Temperature layer in the legend window. ● In the Settings window, select the “Autoset for data in view” button. ● Exit the Settings window.
10. Create a virtual sensor for sea surface temperature data and add to Data View.	● Using your mouse, click a point on the Sea Surface Temperature map offshore from Bradenton and adjacent to the FIMMAP points. ● A time-series graph for the Sea Surface Temperature data will appear. ● Open on the data view menu ★. ● Beneath “FIMMAP test” check both boxes: ☐ ★ Save to data view & ☐ Add to compare chart.
11. Open your data view.	● Click on the data view name to open from the station view, or click ★ Data views 5 in the upper toolbar and select it.
12. Set the comparison chart time range from May 2010 to May 2012.	● Use the manual time slider on the horizontal axis or click ⚙ at the x/y intersection to open the chart settings. ● Click the time range box to open the calendar. ● Click the start & end dates on the calendar, or adjust in the date boxes. ● Select “Apply”.
13. Add a narrative, save and share your data view.	● Follow steps 13-15 in exercise 1a.