# Introduction

We measured the following variables in ArcGIS for hotels in Fort Lauderdale, Miami Beach, and Key West, Florida:

* Beach width in front of each hotel
* Coral cover in front of each hotel
* Number of dive sites in front of each hotel
* Distance to nearest airport from each hotel

# Data Sources

1. Lodging facilities in Florida: University of Florida GeoPlan Center (<https://www.fgdl.org/metadata/metadata_archive/fgdc_html/gc_hotels_jun11.fgdc.htm>)
2. Coral and hardbottom habitat: Florida Fish and Wildlife Conservation Commission (<http://geodata.myfwc.com/datasets/coral-and-hard-bottom-habitats-in-florida>)
3. Dive sites: see metadata for sources.
4. Airport locations: Natural Earth Data (<https://www.naturalearthdata.com/downloads/10m-cultural-vectors/airports/>)

# Data Selection & Preparation

1. Set projection to GCS\_WGS\_1984
2. Add ESRI World Imagery basemap
3. Lodging facilities in Florida shapefile (“gc\_hotels\_aug16”)
   1. **Step 1:** Select only hotel data:
      1. Right click -> Open Attribute Table
      2. Select By Attributes -> “TYPE” = ‘HOTL’
      3. Right click on “gc\_hotels\_aug16” -> “Create layer from selected features” and rename “FloridaHotels”
   2. **Step 2:** Select city/cities of interest:
      1. Select By Attributes -> “CITY” = ‘FORT LAUDERDALE’
      2. Right click on “FloridaHotels” shapefile -> “Create layer from selected features” and rename “FortLauderdaleHotels”
      3. Repeat as necessary for cities of interest
   3. **Step 3:** Geocode hotel addresses:
      1. Use “Geocode Addresses” tool
         1. Input = “FortLauderdaleHotels”
         2. Output = “GeocodedFortLauderdaleHotels”
      2. Repeat as necessary for cities of interest
   4. **Step 4:** Select only hotels on or near the beach (i.e., those not separated from the beach by a bay).
      1. Select Features -> using the World Imagery basemap as a guide, click and drag to select all hotels between any bays and the beach
      2. Right click on “GeocodedFortLauderdaleHotels” -> “Create layer from selected features” and rename “BeachfrontFortLauderdaleHotelsGeocoded”
      3. Repeat as necessary for cities of interest
   5. **Step 5:** Merge all hotel layers
      1. Use “Merge (Data Management)” tool
      2. Input Datasets = BeachfrontFortLauderdaleHotelsGeocoded + BeachfrontXHotelsGeocoded (add cities as necessary)
      3. Output Dataset = “AllBeachfrontHotels”
4. Coral and hardbottom habitat shapefile
   1. Select only coral reefs:
      1. Select by Attributes -> “DESCRIPT” = ‘Coral Reef’
      2. Right click on “Coral\_and\_Hard\_Bottom\_Habitats\_in\_Florida” -> “Create layer from selected features” and rename “CoralDistribution”

# Measuring Beach Width

1. **Step 1:** Create line and points along shore
   1. Right click geodatabase -> “New” -> “Feature Class” -> Enter Name “ShorelineFortLauderdale”
   2. Type of features stored in this feature class: Line Features
   3. Enter editing session. Choose the workspace you created in step 1a
   4. Construction Tools -> Line
   5. Zoom in and trace where the ocean intersects the beach for the length of the city. A new line is created every time you click
   6. Save edits and stop editing
   7. Use tool “Generate Points Along Lines”
      1. Input = “ShorelineFortLauderdale”
      2. Output = “ShorelinePointsFortLauderdale”
      3. Point placement = DISTANCE
      4. Distance = 30 meters
   8. Repeat as necessary for cities of interest
2. **Step 2:** Create line and points along beach
   1. Right click geodatabase -> “New” -> “Feature Class” -> Enter Name “BeachFortLauderdale”
   2. Repeat steps 1b-d
   3. Zoom in and trace the start of the beach for the length of the city. Save edits and stop editing
   4. Use tool “Generate Points Along Lines”
      1. Input = “BeachFortLauderdale”
      2. Output = “BeachPointsFortLauderdale”
      3. Point placement = DISTANCE
      4. Distance = 30 meters
   5. Repeat as necessary for cities of interest
3. **Step 3:** Merge beach and shoreline points for all cities
   1. Use Merge (Data Management) tool
      1. Input Datasets = ShorelinePointsFortLauderdale + ShorelinePointsX (add cities as necessary)
      2. Output Dataset = “ShorelinePointsAllCities”
   2. Repeat step 3a using input datasets BeachPointsFortLauderdale + BeachPointsX. Output Dataset = “BeachPointsAllCities”
4. **Step 4:** Measure distance to beach for each individual hotel
   1. Use Near (Analysis) tool
      1. Input Features = “AllBeachfrontHotels”
      2. Near Features = “BeachPointsAllCities”
      3. Method = GEODESIC
      4. Check attribute table for “AllBeachfrontHotels”
5. **Step 5:** Export data to Excel
   1. Use “Table to Excel (Conversion)” tool
   2. Input Table = “AllBeachfrontHotels”
   3. Output Excel File = “HotelDistanceToBeach”
6. **Step 6:** Measure distance to shore for each individual hotel
   1. Use “Near (Analysis)” tool
      1. Input Features = “AllBeachfrontHotels”
      2. Near Features = “ShorelinePointsAllCities”
      3. Method = GEODESIC
      4. Check attribute table for “AllBeachfrontHotels”
7. **Step 7:** Export data to Excel
   1. Use “Table to Excel (Conversion)” tool
   2. Input Table = “AllBeachfrontHotels”
   3. Output Excel File = “HotelDistanceToShore”
8. **Step 8:** Measure beach width in front of each individual hotel
   1. Copy/Paste NEAR\_DIST column from the Excel file “HotelDistanceToShore” to “HotelDistanceToBeach” Excel sheet. Rename to DIST\_SHORE and DIST\_BEACH, respectively.
   2. Create a new column titled BEACH\_WIDTH. Subtract the DIST\_BEACH column from DIST\_SHORE for all hotels.

# Measuring Coral Cover

1. **Step 1:** Create a buffer around each individual hotel
   1. Use Buffer (Analysis) tool
   2. Input Features = “AllBeachfrontHotels”
   3. Output Feature Class = “BufferedAllBeachfrontHotels”
   4. Distance = 10 kilometers
   5. Method = GEODESIC
   6. Repeat as necessary for cities of interest
2. **Step 2:** Measure the amount of coral (m2) within each buffer
   1. Right click on “BufferedAllBeachfrontHotels” -> Joins and Relates -> Join…
   2. Join data from another layer based on spatial location
   3. Choose the layer to join to this later -> “CoralDistribution”
   4. How do you want the attributes to be summarized? Check “Sum”
   5. Specify output shapefile or feature class for this new layer: “HotelsCoralJoin”
3. **Step 3:** Export data to Excel
   1. Use “Table to Excel (Conversion)” tool
   2. Input Table = “HotelsCoralJoin”
   3. Output Excel File = “All\_Cities\_Coral\_Cover”

# Measuring Dive Sites within Hotel Buffers

1. **Step 1:** Find the number of dive sites within each buffer
   1. Right click on “BufferedAllBeachfrontHotels” -> Joins and Relates -> Join…
   2. Join data from another layer based on spatial location
   3. Choose the layer to join to this later -> “DiveSites”
   4. How do you want the attributes to be summarized? Check “Sum”
   5. Specify output shapefile or feature class for this new layer: “HotelsDiveSiteJoin”
2. **Step 2:** Export data to Excel
   1. Use “Table to Excel (Conversion)” tool
   2. Input Table = “HotelsDiveSiteJoin”
   3. Output Excel File = “All\_Cities\_Dive\_Sites”

# Measuring Distance to Airport

1. **Step 1:** Measure distance to airport
   1. Use “Near (Analysis)” tool
      1. Input Features = “AllBeachfrontHotels”
      2. Near Features = “ne\_10m\_airports”
      3. Method = GEODESIC
      4. Check attribute table for “AllBeachfrontHotels”
2. **Step 2:** Export data to Excel
   1. Use “Table to Excel (Conversion)” tool
   2. Input Table = “AirportDistance”
   3. Output Excel File = “All\_Cities\_Airport\_Distance”

# Final Step

1. Compile all tables exported from ArcGIS into one .csv file that can be imported into statistical software