Distance from station to nearest upstream waterbody

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1. Use upstream traces built for the monitoring sites.
2. Using a spatial select populate inclNHDLake column with yes or no if upstream trace overlays NHDWaterbodies
3. Added Field called Numwaterbodiesup using a python script to update the number of waterbodies upstream

selQuery = "inclNHDWb IN ('yes')"

traceNameList = ["'" + row[0] + "'" for row in arcpy.da.SearchCursor('UpstreamTrace\_UniqueSites', "UniqLocID", selQuery)]

for id in traceNameList:

selTrace = arcpy.management.SelectLayerByAttribute('UpstreamTrace\_UniqueSites', 'NEW\_SELECTION', "UniqLocID= " + id)

selWaterbodys = arcpy.management.SelectLayerByLocation('James\_NHDWaterbody\_all', 'INTERSECT',selTrace)

count = len([row[0] for row in arcpy.da.SearchCursor(selWaterbodys,"ObjectID")])

with arcpy.da.UpdateCursor(selTrace,"NumWaterbodyUp", "UniqLocID= " + str(id)) as cursor:

for row in cursor:

row[0] = count

cursor.updateRow(row)

1. For each of the upstream paths that where inclNHDLake = 'yes' ran an intersect analysis with the NHDWaterbodies and then converted the result to single parts. This was automated using a python script.
2. The intersect analysis makes a point anywhere the NHDwaterbodies intersect the upstream trace, therefore I went back through each of the paths that include NHDWaterbodies and kept only the most downstream intersection point.
3. Created a shortest path script that uses the trace network tool. This creates an individual line between each site and NHWaterbody. The script then adds a unique id for the lake and merges the paths into a single data layer.
4. Checked that all lakes upstream from sites had paths created by comparing the number of lakes listed in the upstream traces data layer to the number of features within the merged distance to sites data layer using a python code snippet (checkcounts.py). There are separate code snippets for prediction points and observation points.
5. Calculated distance metrics to upstream data layer using python script. (Populates: DistNearestUpWb\_km, NumWb\_1km, NumWb\_5km, and NumWb\_10km). (UpdateDistanceMetricstoUpTrace.py)
6. Calculated upstream Waterbody Area using calUpstreamLakeArea.py
7. Updated Cumulative area of upstream lakes per number of lakes per length of upstream trace ((Cumulative Area of Lakes/ Number of lakes) / (Cumulative Area of Lakes /Total Upstream Length) using python script PopulateAccumulatedUpstreamLakesbynumandlength.py
8. Updated TraceName field to “UniqLocID” for observation points and “StationID\_” for prediction points.
9. For observation points created a csv file that linked the UniqLocID to the StationID\_. There is a one to many relationship.