INSPIRING SOLUTIONS
TO PLASTIC POLLUTION

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ALGALITA

Marine Research and Education

RV ALGUITA AND ALGALITA FOUNDER CHARLIE MOORE

Capt. Charles Moore with Marine Debris - 2008 Voyage

Algalita Marine Research Institute
www.algalita.org


North Pacific Gyre


North Pacific
1 mile
Zooplankton
Trawl
Gyre
North Atlantic
South Pacific
Indian Ocean
South Atlantic

THE MANTA TRAWL

BONGO NETS

TYPES OF FIELD DATA

- Location: latitude/longitude
- Time: trawl start and stop
- Distance
- Trawl Dimensions
- Vessel Readings: boat speed, wind speed, barometric pressure, sea state, water temp etc
- Observations: wave height, swell height, organisms
- More

NORTH PACIFIC GYRE SIZE AND TYPE DATA SHEET

Site No: __ Sample Date _____ Lab Technician _____

Latitude __ Longitude _____ Trawl Type manta_____

SIZE	Fragments		Pellets		Line		Thin Film		Foam						TOTAL COUNT	TOTAL WEIGHT
	Ct	Wt	Ct	Wt	Ct	Wt	Ct	Wt	Ct	Wt	Ct	Wt	Ct	Wt	Ct	Wt
>4.75mm																
2.80-4.749 mm																
1.00-2.79 mm																
0.710-0.999 mm																
0.500-0.709 mm																
0.355-0.499 mm																
TOTAL COUNTS																

Tot Count Dens (Count/m3) ____

TOTAL PLANKTON (A+B)	WET WT (G)	DRY WT (G)	DRY/WET
Combnd wt			#DIV/0!
Tare wt			#DIV/0!
Plankton Wt			

Plastic/ Plankton ratio

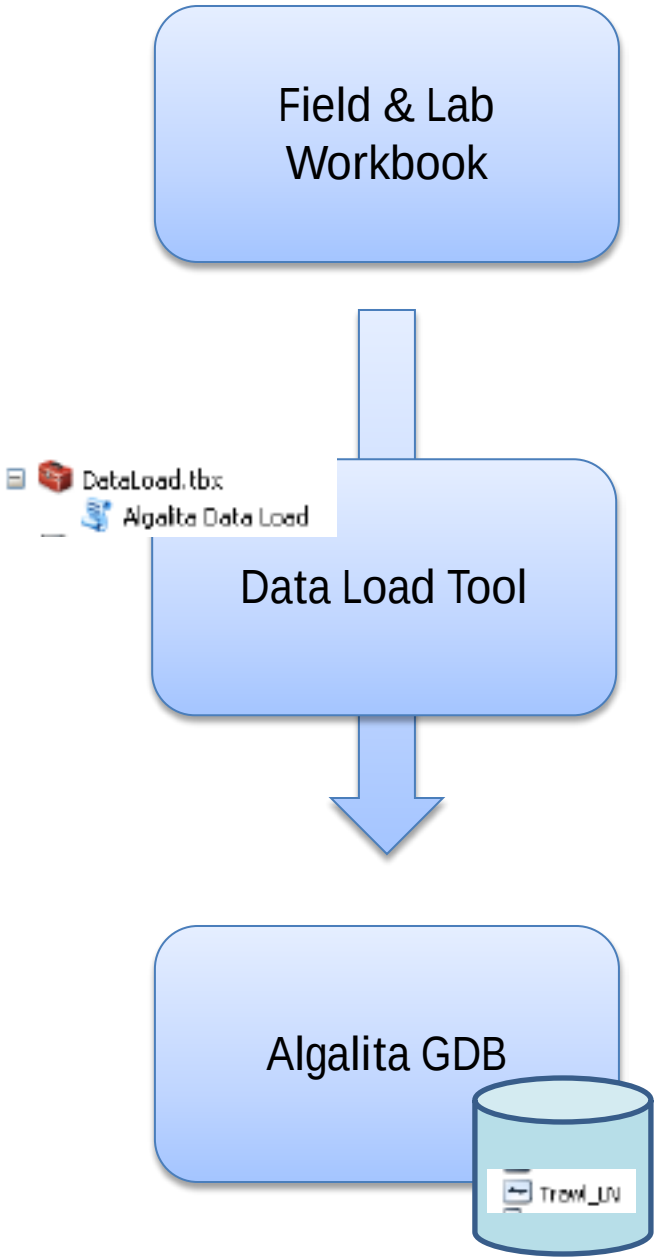
Research Questions

- Where is the highest density of plastics in the oceans?
- Does sea state impact the amount of plastic collected?
- What species or community structures are living in environments with high plastic density?

Need Data!...

GIS TOOL

- ETL = Extract, Transform, Load


Field & Lab
Workbook
DataLoad.tbx
Algalita Data Load
Data Load Tool
Algalita GDB
Trawl_LN

Tool Overview

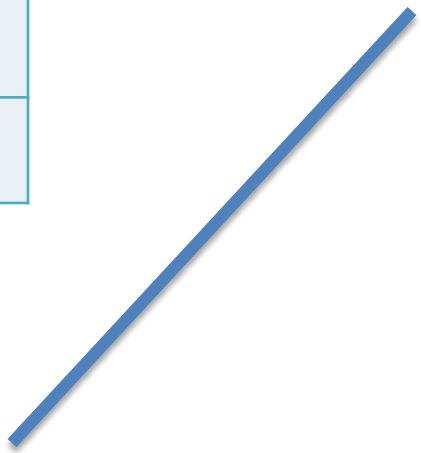
- ArcGIS for Desktop 10.2
- Python script using arcpy, xlrd module
- A cross reference file is used to ‘map’ from the Field & Lab sheet to the GDB
- 3 main steps

Create Geometry

1. Get coordinates from Field & Lab
2. Format to decimal degrees
3. Create start and end point (arcpy.Point)
4. Create line (arcpy.Array; arcpy.Polyline)

TRAWL START			TRAWL END	
Time Start	1:45		Time End	2:45
Lat (N/S) Start	-22, 32.44		Lat (N/S) End	-22,35.11
Lon (E/W) Start	-6,11.32		Lon (E/W) End	-6,12.7

Lat -22.32.44
Long -6, 11.32



Lat -22.35.11
Long -6, 12.7

Get Field & Lab Attributes

5. Use cross reference file
   a) Get each attribute from Field & Lab
   b) Map to field in GDB
6. Create Dictionary with ‘Field’ and ‘Value’

Dict = {}; Dict[SampleID] = [[Field],[Value]]

Trawl #	SeaDragon01152011_4
Date	1/17/2011

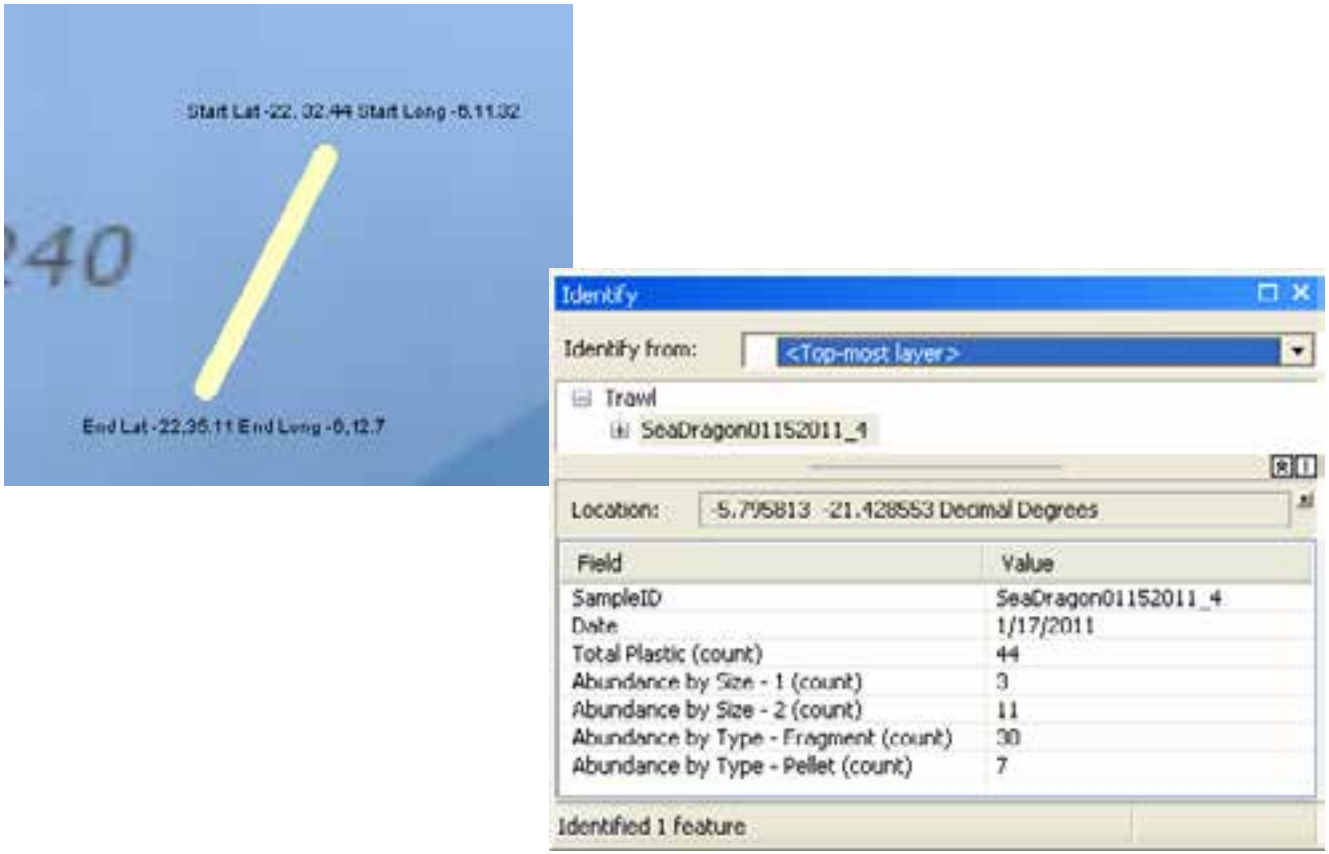
Size & Type	Fragment	Pellet	…	TOTAL
> 4.75	3			3
2.80-4.749	4	7		11
…				
TOTAL	30	7		44

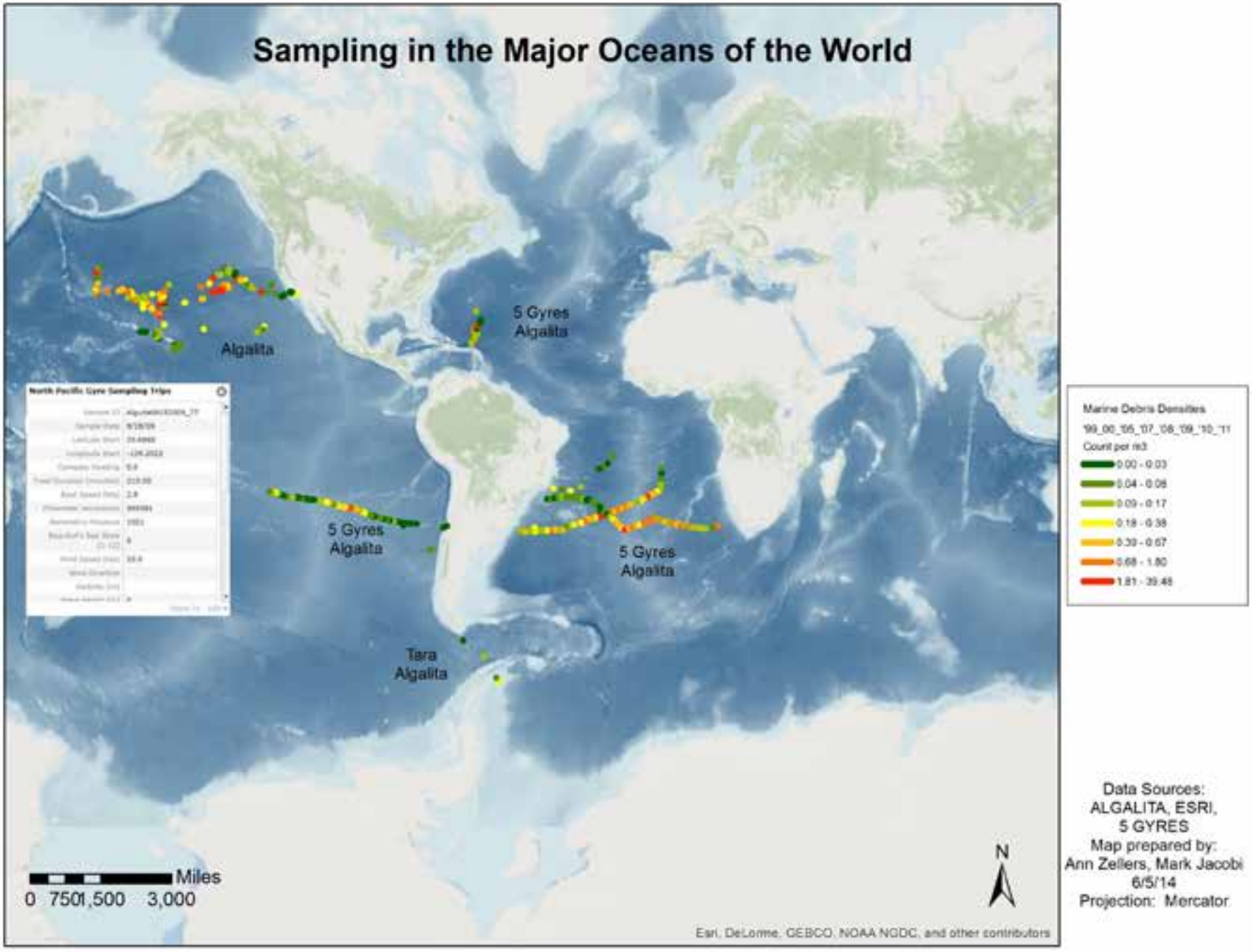
{SeaDragon01152011_1 :
[[Trawl#, Sz_1_Ct, Sz_2_Ct],
[SeaDragon01152011_4, 3, 11]]

Populate GDB

7. Add new feature to Trawl feature class

arcpy.da.InsertCursor; insertRow





Data Sources:
ALGALITA, ESRI,
5 GYRES
Map prepared by:
Ann Zellers, Mark Jacobi
6/5/14
Projection: Mercator

PUBLISH MAPS IN GIS ONLINE

- Address map content to two different viewers:
  - Public
  - Scientists

  Public Map uses story maps to tell the different stories that can be made with the differing variables

  Scientist Map gives the viewer more freedom to scroll through variables and make queries