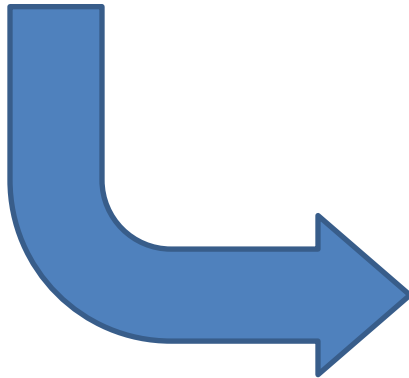


The Oyster Data Tool: Compiling State and Federal Oyster-related Data into a Single Database



Chesapeake Bay Oyster Reporting Tool

Username: _____ Password: _____ Submit



Month: OCT 2009-2010 Maryland Monthly Oyster Report

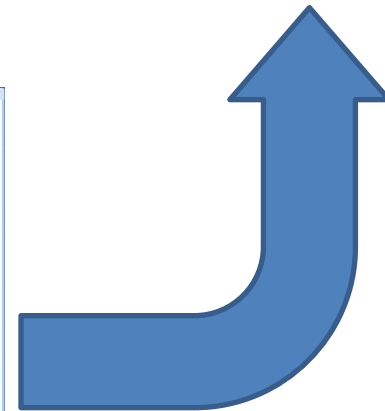
Date	# Bushels	Gear	Bar Name	Sold To	Landing Area	Comments
10/7/2009	8	Patent Tong	GREAT ROCK	99912	Crisfield	
10/6/2009	10	Patent Tong	GREAT ROCK	99912	Crisfield	
10/7/2009	2	Patent Tong	GREAT ROCK	99912	Crisfield	
10/12/2009	9	Patent Tong	GREAT ROCK	99912	Crisfield	
10/11/2009	10	Patent Tong	GREAT ROCK	99912	Crisfield	
10/20/2009	8	Patent Tong	GREAT ROCK	99912	Crisfield	
10/21/2009	8	Patent Tong	GREAT ROCK	99912	Crisfield	
10/22/2009	9	Patent Tong	GREAT ROCK	99912	Crisfield	

4349-OHR Check if there was no reported harvest

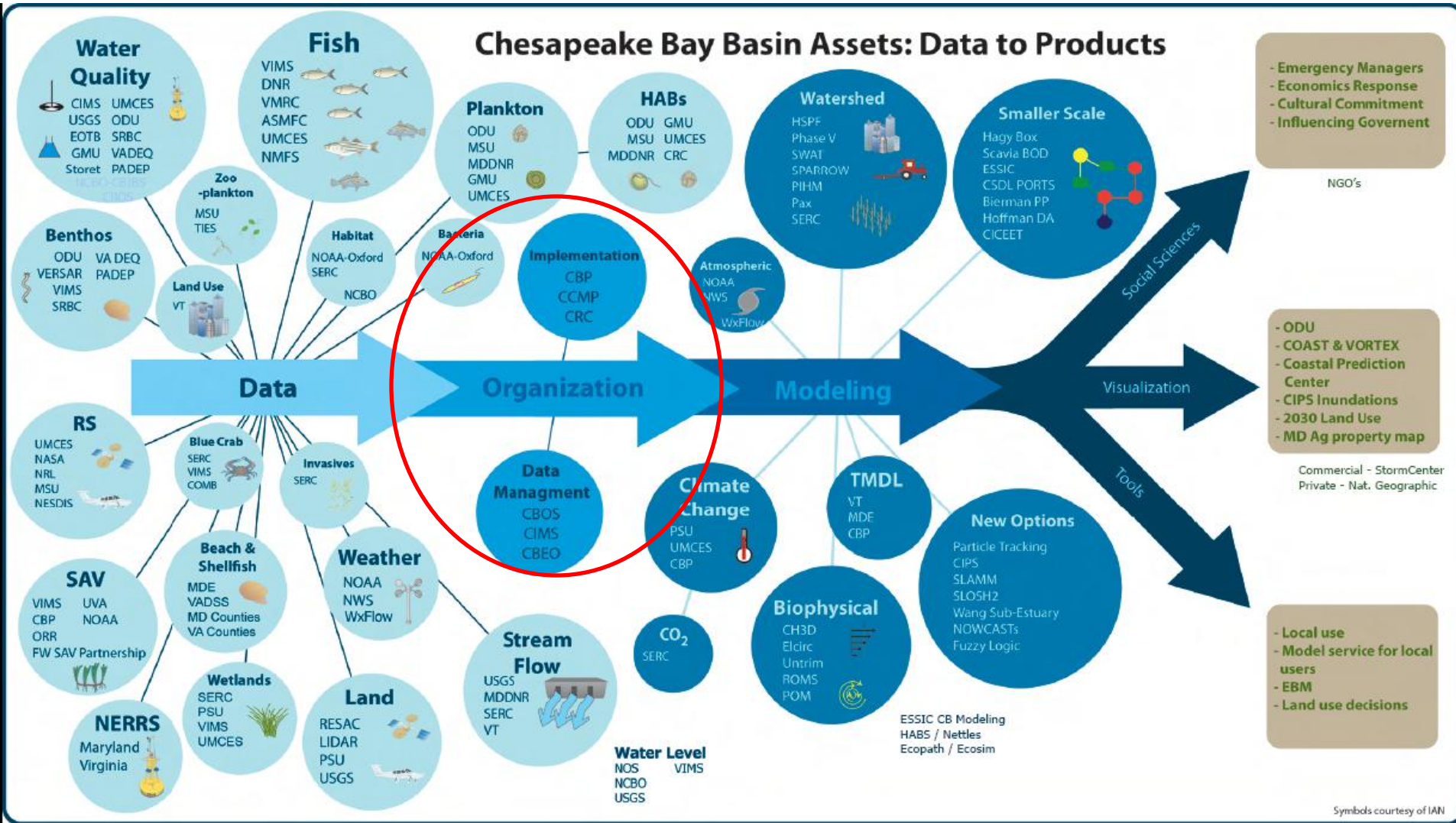
License Number: MARSHALL, ROBERT L Date: 10/30/2009

Name: _____

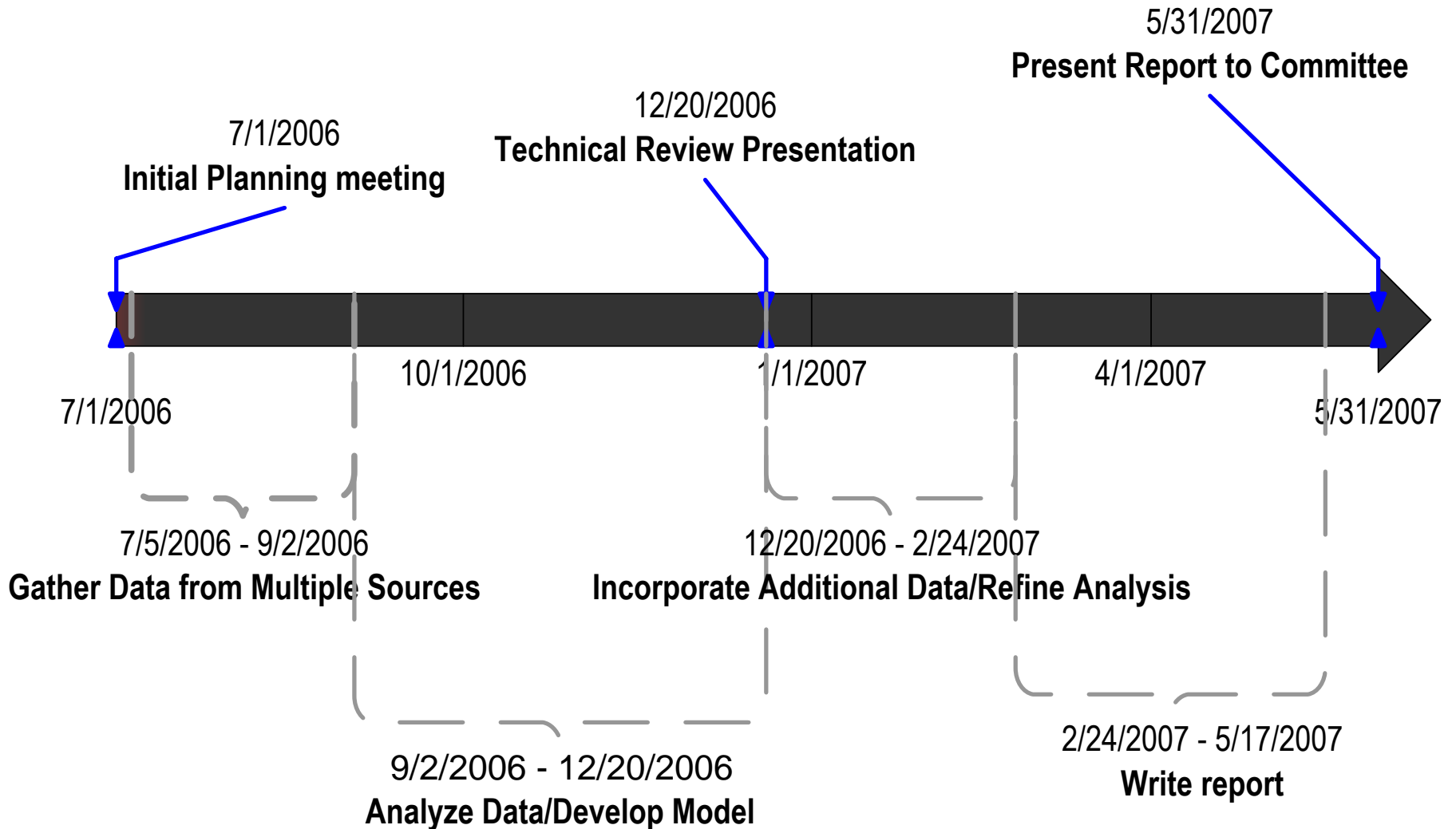
Previous Sheet Add New Next Sheet Search for a License Number



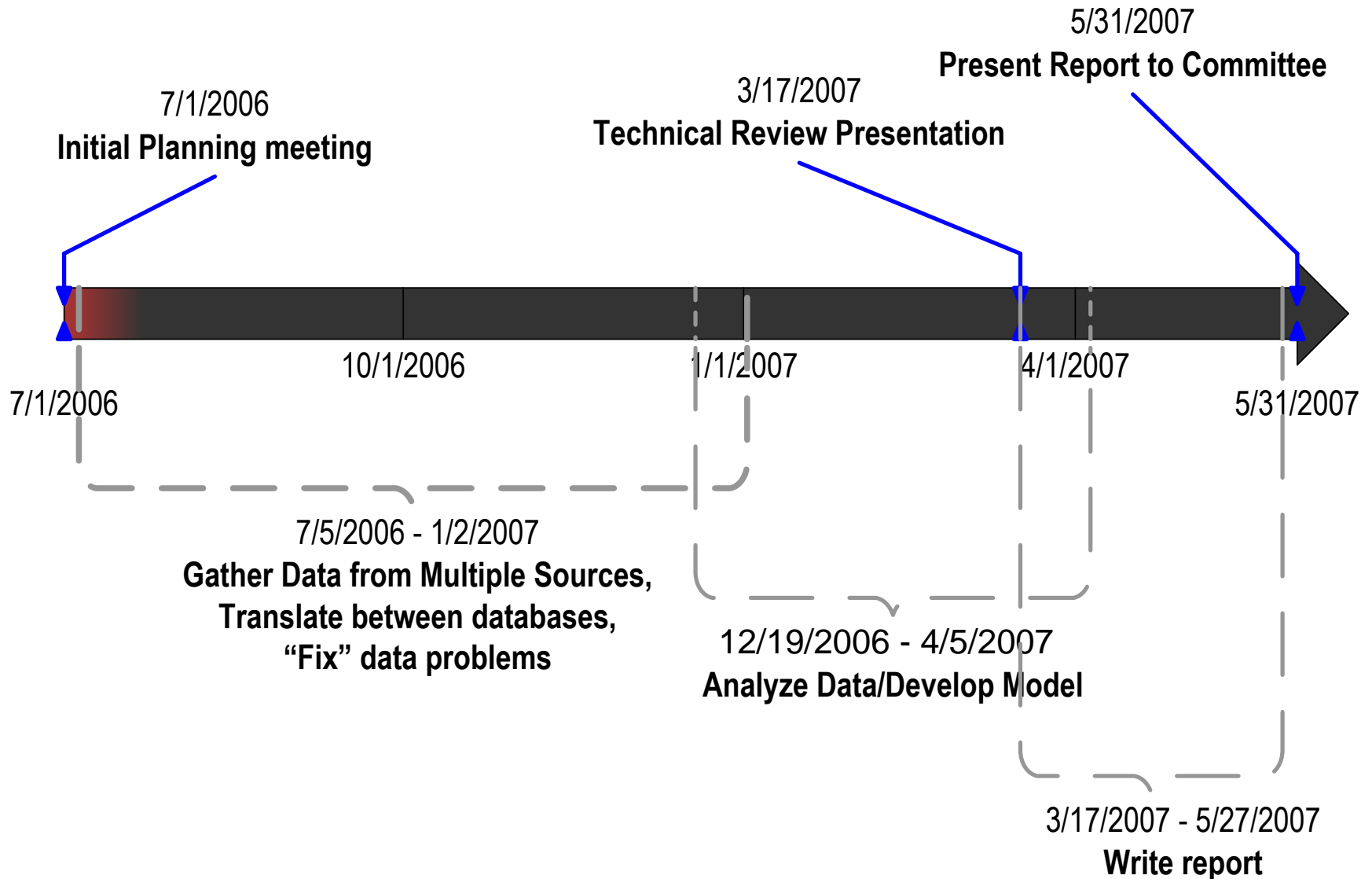
Ideal View of Providing Science For Ecosystem-based Restoration



Ideal timeline for completing analysis/modeling project



Real timeline for completing analysis/modeling project

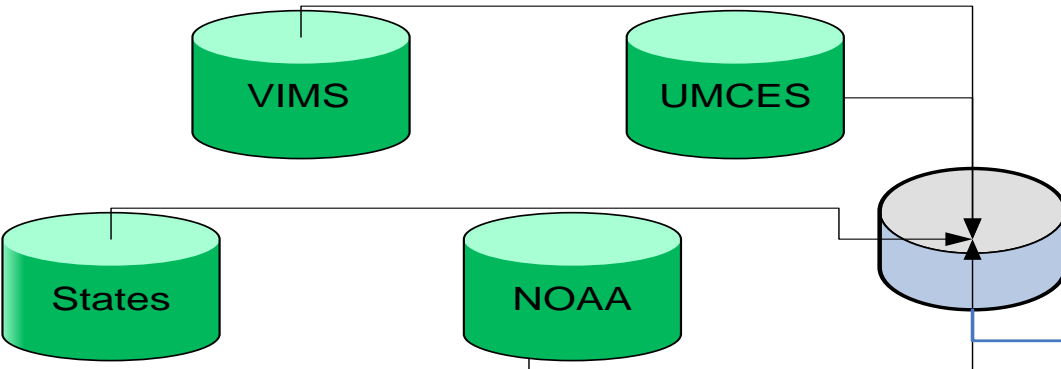


Reasons we ought to be integrating data

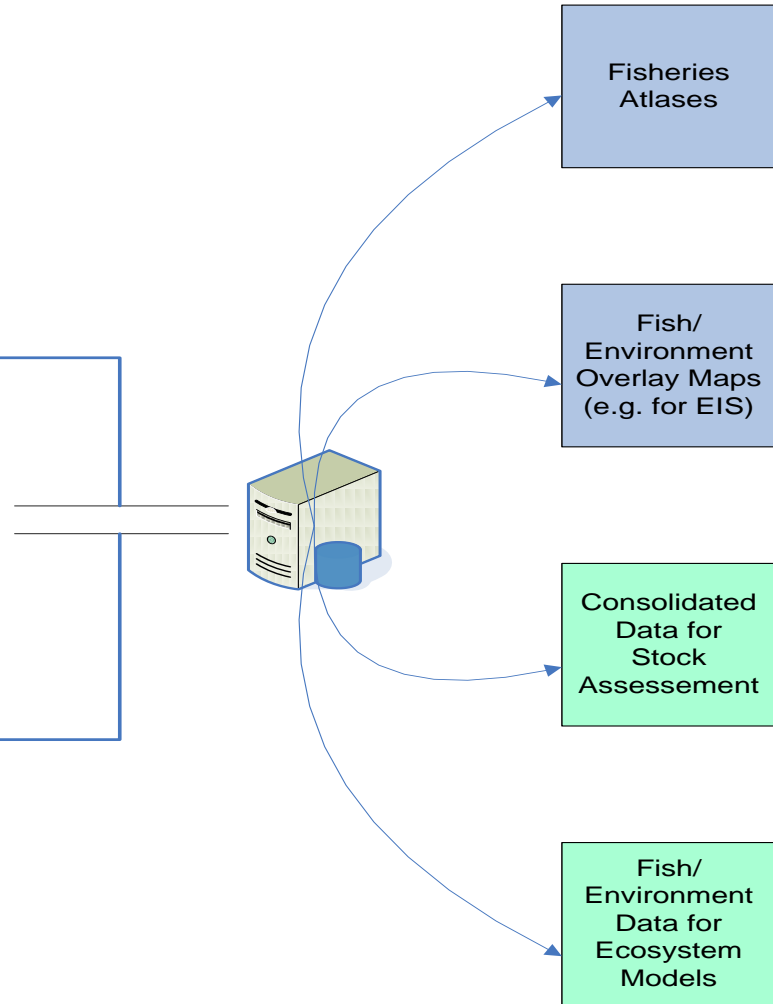
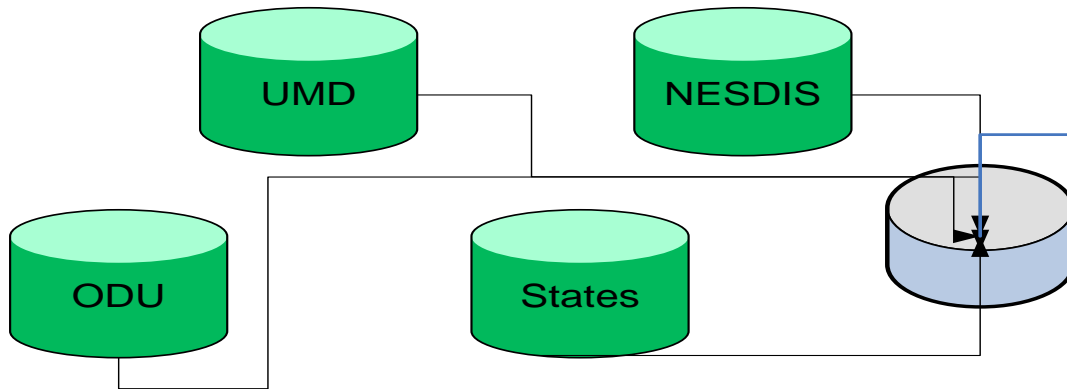
- International Council for the Exploration of the Seas – “By maximizing the availability of data to the community at-large, ICES promotes the use of these data, thereby ensuring that their maximum value can be realized and thus contribute to an increased understanding of the marine environment.”
- National Research Council Report 2006 Dynamic Changes in Marine Ecosystems- “Fisheries data currently are fragmented and dispersed, thus slowing the use of these data in comprehensive analysis...Better data management is fundamental to implementing ecosystem-based management of fisheries.”
- NOAA- Key Science needs to support EAM - “Modeling, experimental ecology, and observation systems linked to support adaptive approaches to human uses of marine ecosystems consistent with goals of sustainable use”

Chesapeake Bay Ecosystem Integrated Information Systems (CBEIIS) – Expediting Data delivery and Integration

Fisheries Data System



Physical Observations Data System



First steps towards expedited and integrated data delivery

- Chesapeake Bay Ecosystem Integrated Information Systems (CBEIIS) – Incorporating Oysters:
 - Comprehensive Chesapeake Oyster Database

Maryland DNR Annual Fall Oyster Survey

Sample Year: 2008 Date: 10/16/2008 Bar ID: BAR840
Bar Name: BIG ANNEMESSEX Bar Region: BIG ANNEMESSEX RIVER
Sub Area Name of the Bar: _____
Replicate: 1 Gear: Dredge Gear Area: 0.8382
Bar Type: Nat
Planting Seed (Year): _____ Planting DSH (Year): _____ Planting FSH (Year): _____
Temperature (C): 22.7 Salinity (ppt): 19.8 Depth (ft): 15 Tow Distance (ft): 107
Volume (bushels): 0.6 2.1 bushels + full dredge Sub Sample Volume: 1/5 MD Bushel

Market	Small	Spot	Total	
Number of Live Oysters	0	6	44	50
Number of Dead Oysters	0	0	0	0
Recent Box	0	6	2	
Old Box	0	6	2	8
All Boxes	0	6	2	8

Observed Mortality: 50.00 4.35 13.79
Average Size: 37.00 20.00

Latitude: Degrees 38 mm mmm 3.27 Decimal Degrees 38.0145
Longitude: Degrees 75 mm mmm 61.362 Decimal Degrees -75.5850333333333

Check if a sample was taken for disease testing

Comments: _____

Buttons: First Sample, Next Sample, Previous Sample, Last Sample, Add New, Find Sample

Chesapeake Bay Oyster Reporting Tool

Username: _____ Password: _____ Submit

Map of Chesapeake Bay with a legend overlay. Legend items include: Base Layer, Satellite, Hybrid, Normal, Overlay, Bottom Type, Bathymetry, ChesROMS Salinity, ChesROMS Temperature, Site Info, Survey (SOM), Sandburles.

Bottom Type: Fish Haven Artificial Reef, Boulders, Granite/Cobble, Sand, Buried Oyster Shell, Clay/Silt, Clay/Silt/Sand, Unclassified

Bathymetry (m): 0 - 3.0, 3.1 - 6.0, 6.1 - 9.0, 9.1 - 12.0, 12.1 - 20.0

ChesROMS Month: 2010-07

ChesROMS Salinity Forecast (ppm): Salinity Avg between 10 and 20, Salinity Min between 0 and 35, Salinity Max between 0 and 35

ChesROMS Temperature Forecast (deg C): Temperature Avg between 0 and 35, Temperature Min between 0 and 35, Temperature Max between 0 and 35

– Oyster Data Tool

First steps towards expedited and integrated data delivery

- COD: Integration of geo-referenced oyster data enables spatial visualization of all facets of oyster management
 - Managers can pull up information on disease, harvest, restoration, and mortality for a given bar at the click of a mouse.
- Oyster Data Tool: Integration of geo-referenced oyster data with other water quality /physico-chemical and habitat data facilitates making connections between water quality, habitat, and living resources.
 - Facilitates science-grounding of ecosystem-based management, with at-a-glance environmental info.
 - Facilitates research and understanding. Scientists and managers will be able to spend more time on analysis and modeling and less time on searching for data and integrating it.

Comprehensive Chesapeake Oyster Database (COD)

- Maryland DNR, and Virginia MRC, to develop improved methods for entering and integrating all facets of oyster data
 - Including harvest, disease, survey and restoration
- Data can be more rapidly QA/QC'ed and reports easily generated

Maryland Department of Natural Resources
Oyster Harvest Database

Enter Shellfish Buy Ticket Data
 Enter Monthly Oyster Landings Data

Search for Oyster Bar Names
 Search for Watermen
 Search for Oyster Buyers

QAQC Data Entry
 View All Data in Table Format

Export Data to Master Database

Total Harvest By Year and
 By Month
 By NOAA Code
 By River System
 By Bar
 By Watermen
 By Watermen and Month
 By Waterman License Type
 By Gear Type
 By Buyer

Maryland DNR Annual Fall Oyster Survey

Sample Year: 2008 Date: 10/18/2008 Bar ID: BARBA0
 Bar Name: BIG ANNESSESSEX Bar Region: BIG ANNESSESSEX RIVER
 Sub Area Name of the Bar: _____
 Replicate: 1 Gear: Dredge Gear Area: 0.8382
 Bar Type: Nat Planting Seed (Year): _____ Planting DSH (Year): _____ Planting FSH (Year): _____
 Temperature (C): 22.7 Salinity (ppt): 19.8 Depth (ft): 15 Tow Distance (ft): 107
 Volume (bushels): 0.6 2.1 bushels = Full dredge Sub Sample Volume: 1/5 MD Bushel

	Market	Small	Spot	Total
Number of Live Oysters	0	6	44	50
Number of Dead Oysters				
Recent Box	0	0	0	
Old Box	0	6	2	
All Boxes	0	6	2	8
Observed Mortality		50.00	4.35	13.79
Average Size		37.00	20.00	

Latitude Degrees: 38 mm mmm 3.27 Decimal Degrees: 38.6545
 Longitude Degrees: 75 mm mmm 51.3623 Decimal Degrees: -75.6860333333333

Check if a sample was taken for disease testing
 Comments: _____

Year	River	Area Planted (Acres)	New Area Planted (Acres)	# Spat Planted (millions)	# Tanks	Bushels of Shell Planted
2008	EASTERN BAY NORTH	33.0166102977	9.39	42.72	27	4320
2008	HONGA RIVER	13.35217254254	11.11170780164	20.56	18	2880
2008	HOOPER STRAITS	15.4412618112	8.22752172825	34.47	14	2240
2008	LOWER ANNE ARUNDEL SI	16.1966866754	8.12725582101	28.34	13	2080
2008	LOWER CHESTER RIVER	40.3107531731	20.68135481325	124.12	62	9920
2008	MAGDOFF RIVER	3.86430229467	6	4.33	4	660
2008	MANOKIN RIVER	7.6350937823	7.6350937823	10.24	7	1120
2008	MIDDLE CHOPTANK RIVER	85.5704538783	64.3312991346	105.37	67	10720
2008	NAANTICOKE AND WICCOMO	9.82646057949	9.82646057949	19.61	7	1120
2008	SEVERN RIVER	4.8078032982	4.8078032982	18.17	9	1440
2008	SOUTH RIVER	3.6784271513	2.28	3.33	3	480
2008	TRED AVON RIVER	6.9185759954	6.9185759954	14.07	8	1280
2008	UPPER CHESTER RIVER	26.66108239703	6.6	45.94	23	3600
2008	UPPER CHOPTANK RIVER	66.9645666688	18.75908398	119.25	76	12160
2008	UPPER PATUXENT RIVER	21.4939910262	14.7171588958	34.86	23	3600
2008	WICCOMO RIVER	3.95838960666	2.86	13.5	9	1440

COD- Facilitates Data Entry

When the user clicks on this button, a data entry form for hatchery seed planting will open.

Bar Enhancement Data

- Hatchery Seed Planting Data

View/Print Data Sheets

- Bar Enhancement
- Hatchery Seed Planting

View Data Tables

- Bar Enhancement
- Coordinates
- Hatchery Seed Planting

View Summary Tables

Bar Enhancement

- By Year and Bar

Hatchery Seed Planting

- By Year
- By Year and Bar Type
- By Year and River

View/Print Reports

- Hatchery Seed Planting Report
- Export data to Master Database

Activities database for bar enhancement and hatchery seed planting

COD- Facilitates Data Entry

HSPDataEntry

Maryland Oyster Restoration - Hatchery Seed Planting Data Sheet

Date Data Logger

Bar Name

Captain Vessel

Lead Organization Crew

Funding Organization Other Groups Involved

Next Record

Previous Record

First Record

Last Record

Add New Record

Bottom Type

Depth meters feet

Weather

Water Quality Temp Salinity DO

Surface

Bottom

Area Planted acres m2

Hypack Filename

Report Filename

Other Filename

Comments

Map Picture File Name Map Saved on Computer (Path Name)

Lat Degrees	Lat MM.MMM	Lat Decimal Degrees	Lon Degrees
*			

Times

Depart Dock

Start Planting

Stop Planting

Hatchery Name Broodstock

Were the Spat Grown Out in a Nursey Prior to Planting? Is the Spat on Shell?

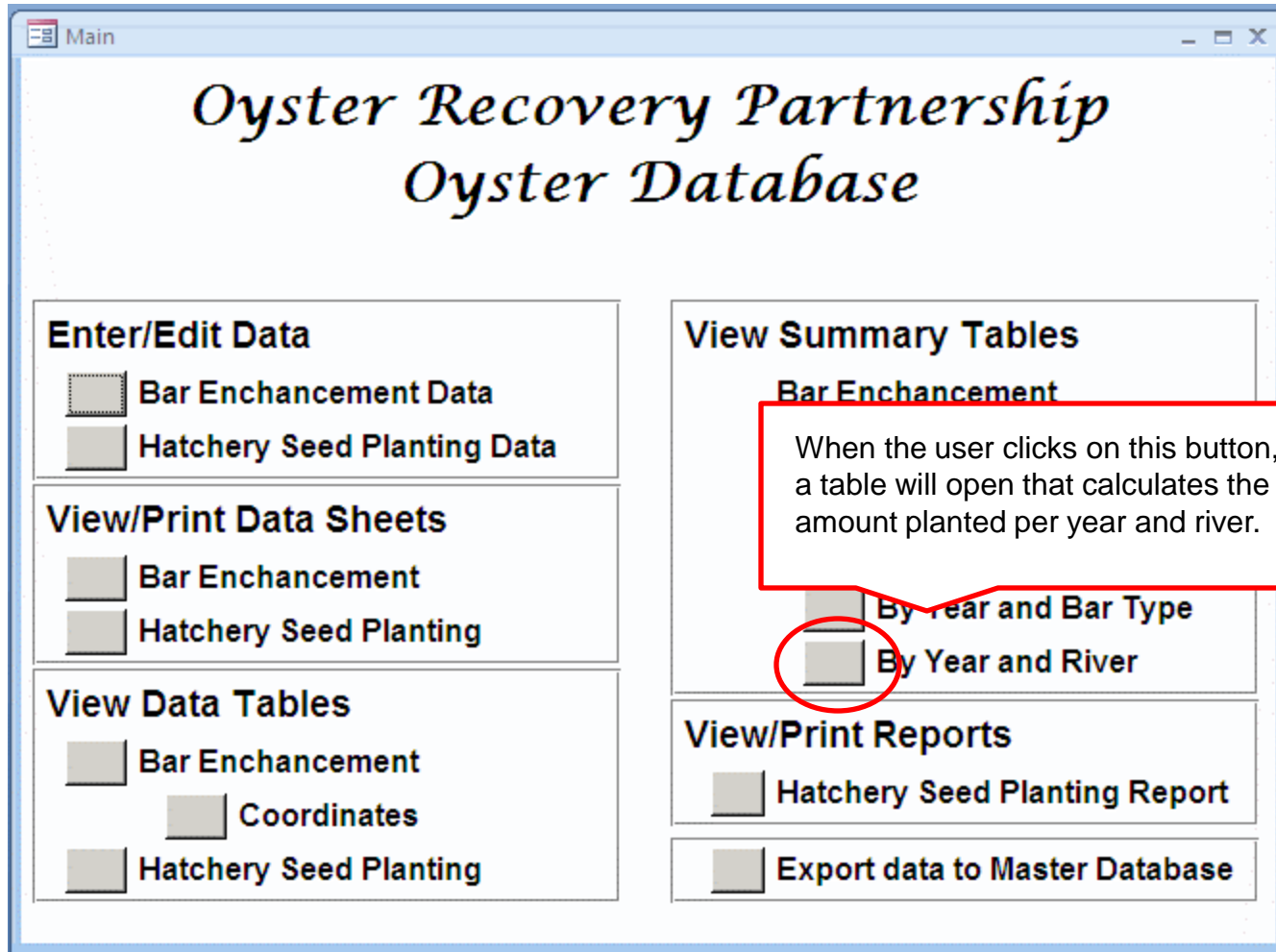
Total # Spat millions bushels cubic yards

Average Spat Size (mm) Average # of Spat per Shell

Tank	Avg Spat Size (mm)	# Spat (millions)	Avg # Spat per Shell
*			

Record: 162 of 162 No Filter Search

COD- Facilitates Reporting



Activities database for bar enhancement and hatchery seed planting

COD- Facilitates Reporting

Year	River	Area Planted (Acres)	New Area Planted (Acres)	# Spat Planted (millions)	# Tanks	Bushels of Shell Planted
2009	EASTERN BAY NORTH	33.0166102077	9.39	42.72	27	4320
2009	HONGA RIVER	13.35317294854	11.11767080964	20.66	18	2880
2009	HOOPER STRAITS	15.4412663812	8.22752172825	34.47	14	2240
2009	LOWER ANNE ARUNDEL SI	16.19660860754	8.12725582101	28.34	13	2080
2009	LOWER CHESTER RIVER	60.31075581731	20.68135481923	124.12	62	9920
2009	MAGOTHY RIVER	3.664362229487	0	4.33	4	640
2009	MANOKIN RIVER	7.63509337823	7.63509337823	10.24	7	1120
2009	MIDDLE CHOPTANK RIVER	85.57704538783	64.33129973746	105.37	67	10720
2009	NANTICOKE AND WICOMI	9.92466597949	9.92466597949	19.81	7	1120
2009	SEVERN RIVER	4.80708032982	4.80708032982	18.17	9	1440
2009	SOUTH RIVER	3.67842271513	2.28	3.33	3	480
2009	TRED AVON RIVER	6.91895799954	6.91895799954	14.07	8	1280
2009	UPPER CHESTER RIVER	26.66108299703	6.8	45.94	23	3680
2009	UPPER CHOPTANK RIVER	66.96456966688	18.759058398	119.25	76	12160
2009	UPPER PATUXENT RIVER	23.6309920262	14.7171596953	34.86	23	3680
2009	WICOMICO RIVER	3.99289960366	2.98	19.5	9	1440

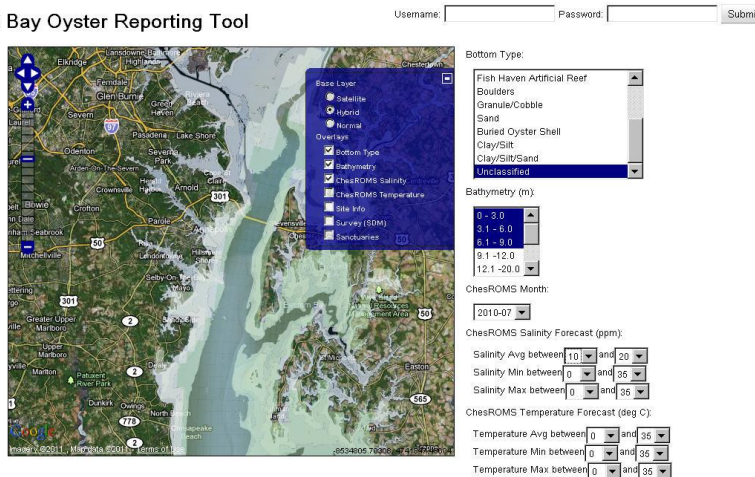
Record: 1 of 16 No Filter Search

Example of a summary table created from database calculating total area planted and number of spat planted. This can be pasted into a report or excel table, or imported into an analysis program like SAS or R. As more data is entered into the database, this table will be automatically updated.

Chesapeake Bay Ecosystem Integrated Information System (CBEIIS) – Oyster Data Tool

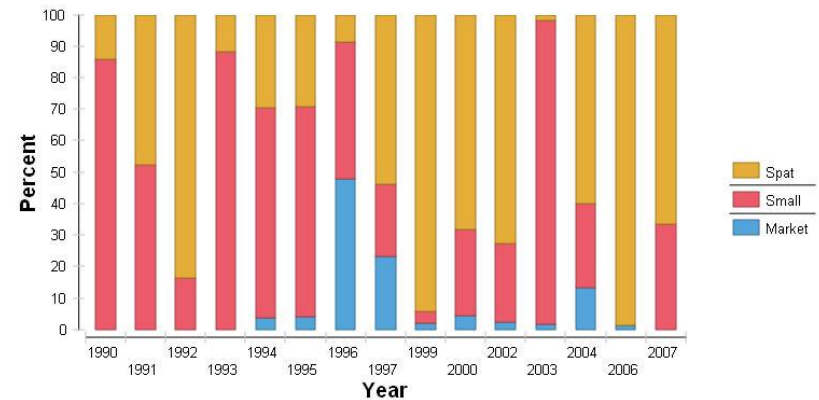
- Working with Versar, NCBO has developed methods for integrating oyster data (and other living resource data) with water quality (physicochemical data) and displaying data on maps and generating reports. All this can be done from a web browser.
 - For example, the system allows temperature, salinity, and bathymetry data to be overlaid on a map with restoration and disease data. This will help make decision on where to invest restoration funds

Chesapeake Bay Oyster Reporting Tool



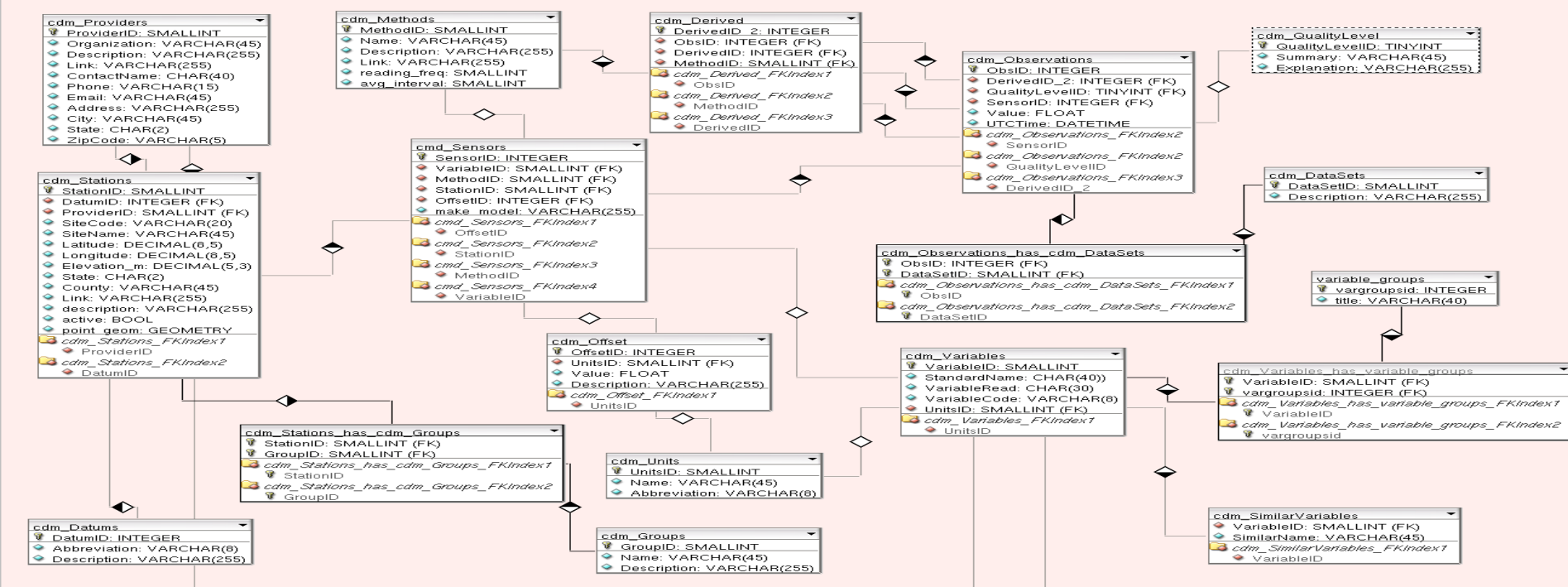
BARBA0

Live Oyster Abundance Size Composition

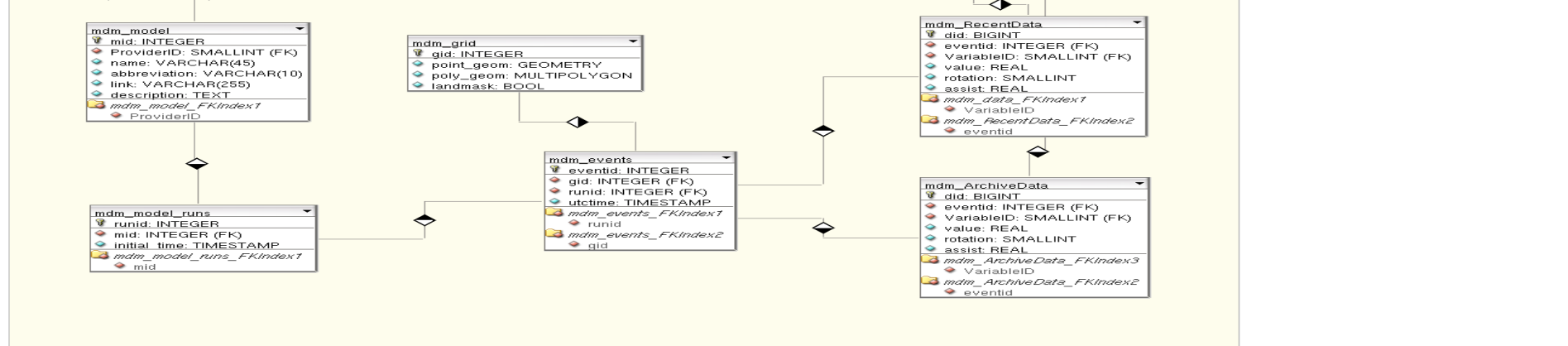


Oyster Data Tool – Connects to Lots of Physical/Observations Data

CBOS-ODM (Observation schema)



CBOS-MDM (Model schema)



Pitfalls and peaks for developing Integrated IS

