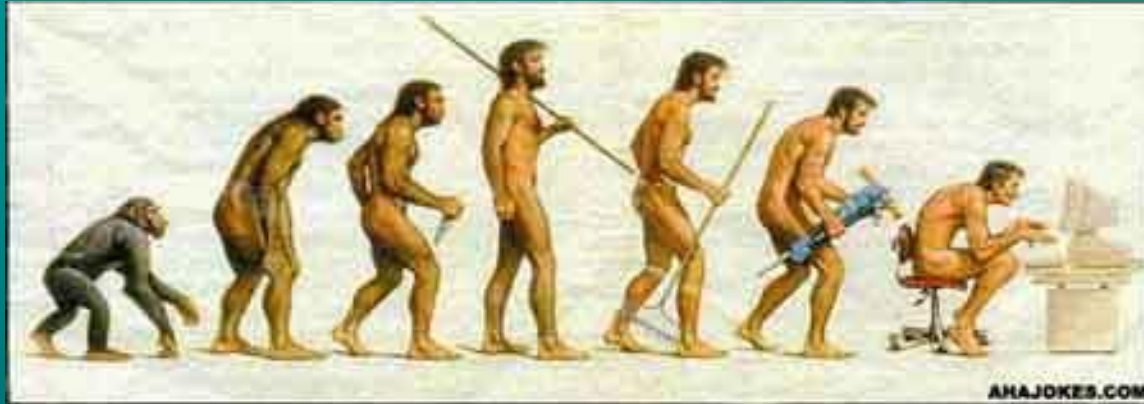


Electronic Data Collection



An evolution

Presentation Objectives

- Relate my experience
 - Hardware/software
 - What worked & what didn't
- Walk away nuggets

The Basics (4W's + H)

- If you're not going to use the data, why collect it in the first place?
- Who are you collecting it for?
 - Yourself, EPA, DWS
- What's your role?
 - Manager, field inspector, data manager...
 - What's the value added?
- Why are you collecting data?
 - Because you have to, support regulatory req's,
- Where are you collecting data?
 - Working environment
 - Anticipated abuse...
- KISS
 - Hardware/Databases need maintenance & management
- Garbage in...garbage out





REGION 1

CHAIN OF CUSTODY RECORD

PROJ. NO. 03070015		PROJECT NAME				NO. OF CONTAINERS	ANIONS/CATIONS/CAT NO ₂ /NO ₃ Total P Alkalinity Total Mercury TSS TDS TOC HARDNESS AMMONIA TKN Dissolved Metals											REMARKS								
SAMPLERS: (Signatures)		[Redacted]					Sample Number																			
HEX STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION																					
36	7/8/03	5:10:35		✓	Woburn Brook	7	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	33616
26	7/7/03	14:00		✓	Tuck 26 Lake Fair	7	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	33622
31	7/9/03	10:20		✓	Goston Brook	7	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	33620
41	7-1-03	18:00		✓	Woburn Brook Mill Brook	7	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	33621
40	7/10/03	13:20		✓	Glenn Brook	7	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	33614
49	7/10/03	09:30		✓	N. B. Horn River	7	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	33615
Relinquished by: (Signature)						Date / Time		Received by: (Signature)						Date / Time		Received by: (Signature)										
Relinquished by: (Signature)						Date / Time		Received by: (Signature)						Date / Time		Received by: (Signature)										
Relinquished by: (Signature)						Date / Time		Received for Laboratory by: (Signature)						Date / Time		Remarks										

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

1-13764

Big Projects - NELP

- New England Lakes & Ponds
 - Subset of NLA
- 2 field teams of 5-6 techs
 - >450,000 discrete data entries
 - Remote areas
 - Data collection is expensive
 - It had better be right
 - It had better be consistent
 - Can't go back
 - Equipment has to work
 - Varying environmental conditions



LAKE SHORELINE SAMPLE COLLECTION FORM

Reviewed by (initial): _____

SITE ID: NLA06608- DATE: / /

BENTHOS

Sample ID	Sample Type *	No. of Jars	Flag	Comment																	
STATION		A		B		C		D		E		F		G		H		I		J	
SUBSTRATE	COLL.	Sub	Coll	Sub	Coll	Sub	Coll	Sub	Coll	Sub	Coll	Sub	Coll	Sub	Coll	Sub	Coll	Sub	Coll	Sub	Coll
Rocky/Cobble/ Woody debris	Boat	<input type="radio"/> R	<input type="radio"/> B	<input type="radio"/> R	<input type="radio"/> B	<input type="radio"/> R	<input type="radio"/> B	<input type="radio"/> R	<input type="radio"/> B	<input type="radio"/> R	<input type="radio"/> B	<input type="radio"/> R	<input type="radio"/> B	<input type="radio"/> R	<input type="radio"/> B	<input type="radio"/> R	<input type="radio"/> B	<input type="radio"/> R	<input type="radio"/> B	<input type="radio"/> R	<input type="radio"/> B
Macrophyte beds	Wading	<input type="radio"/> M	<input type="radio"/> W	<input type="radio"/> M	<input type="radio"/> W	<input type="radio"/> M	<input type="radio"/> W	<input type="radio"/> M	<input type="radio"/> W	<input type="radio"/> M	<input type="radio"/> W	<input type="radio"/> M	<input type="radio"/> W	<input type="radio"/> M	<input type="radio"/> W	<input type="radio"/> M	<input type="radio"/> W	<input type="radio"/> M	<input type="radio"/> W	<input type="radio"/> M	<input type="radio"/> W
Organic/Fine muds		<input type="radio"/> F	<input type="radio"/> F	<input type="radio"/> F	<input type="radio"/> F	<input type="radio"/> F	<input type="radio"/> F	<input type="radio"/> F	<input type="radio"/> F	<input type="radio"/> F	<input type="radio"/> F	<input type="radio"/> F	<input type="radio"/> F	<input type="radio"/> F	<input type="radio"/> F	<input type="radio"/> F	<input type="radio"/> F	<input type="radio"/> F	<input type="radio"/> F	<input type="radio"/> F	<input type="radio"/> F
Leaf pack		<input type="radio"/> L	<input type="radio"/> L	<input type="radio"/> L	<input type="radio"/> L	<input type="radio"/> L	<input type="radio"/> L	<input type="radio"/> L	<input type="radio"/> L	<input type="radio"/> L	<input type="radio"/> L	<input type="radio"/> L	<input type="radio"/> L	<input type="radio"/> L	<input type="radio"/> L	<input type="radio"/> L	<input type="radio"/> L	<input type="radio"/> L	<input type="radio"/> L	<input type="radio"/> L	<input type="radio"/> L
Other: Note in Comments		<input type="radio"/> O	<input type="radio"/> O	<input type="radio"/> O	<input type="radio"/> O	<input type="radio"/> O	<input type="radio"/> O	<input type="radio"/> O	<input type="radio"/> O	<input type="radio"/> O	<input type="radio"/> O	<input type="radio"/> O	<input type="radio"/> O	<input type="radio"/> O	<input type="radio"/> O	<input type="radio"/> O	<input type="radio"/> O	<input type="radio"/> O	<input type="radio"/> O	<input type="radio"/> O	<input type="radio"/> O
FLAG																					

25 field data sheets

for each lake

Field & lab data compatibility

Scanned/paper/electronic

* Sample Types: P = Primary; D = Field duplicate

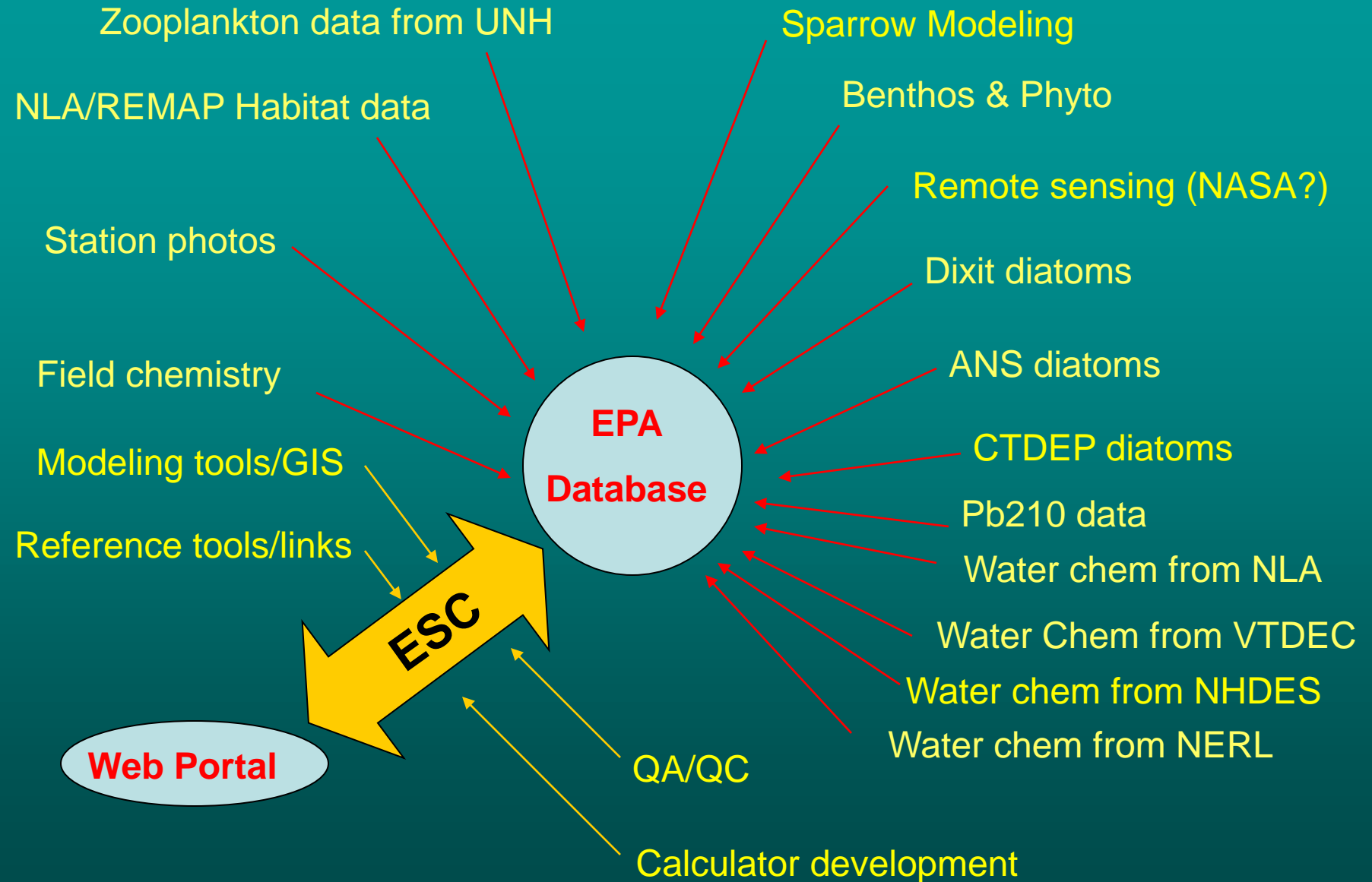
Flag	Comment

Flag codes: K = No measurement or observation made; U = Suspect measurement or observation; F1, F2, etc. = misc. flags assigned by field crew. Explain all flags in comment sections.



28763

NELP Data Categories



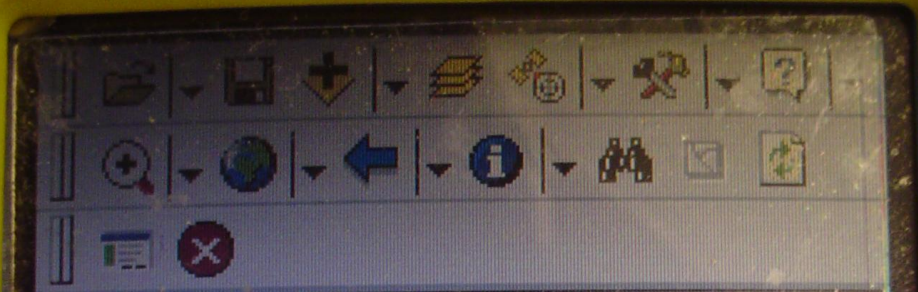


Data Capture Technology

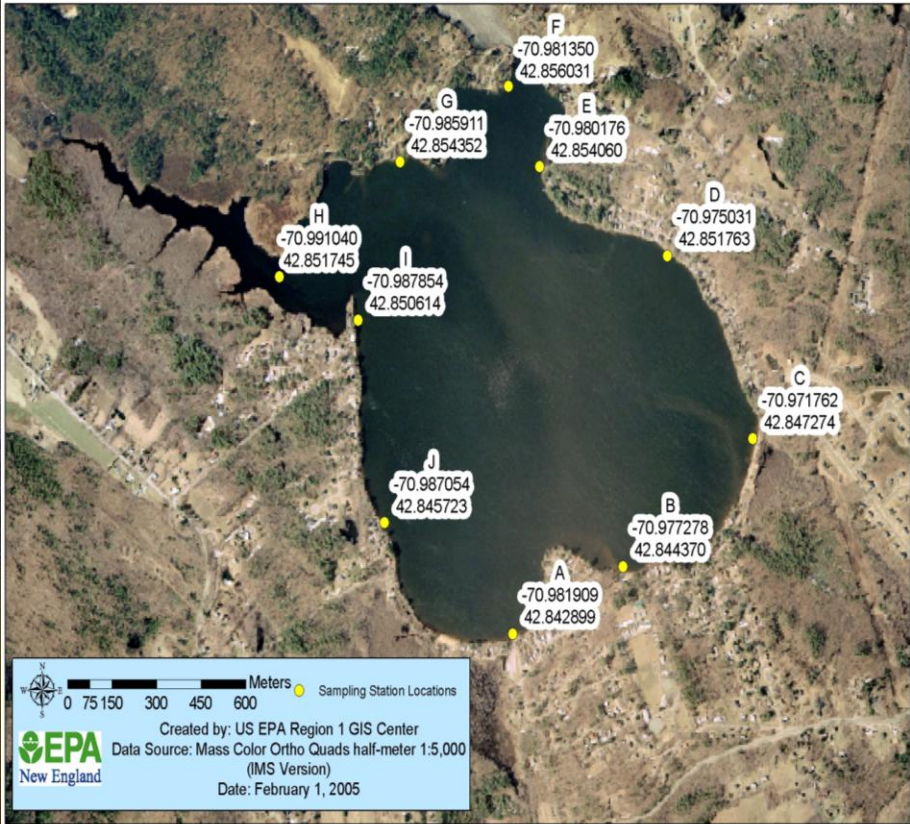
Data consistency,
legibility, transferability,
archivable

A screenshot of the 'Fish Collection' software window. The window title is 'Fish Collection'. It features a toolbar with 'Add Fish', 'Review', and navigation arrows. The main form includes:

- 'Select Fish:' dropdown menu (currently empty)
- 'Lgth(cm):' text box (0), 'Wt(g):' text box (0), and 'Age:' dropdown menu
- 'Sex:' dropdown menu, 'Deform:' dropdown menu (None), and 'Lesions:' dropdown menu (None)
- 'Method:' dropdown menu (Shock Boat), 'Eroded fins:' dropdown menu (None), and 'Tumor:' dropdown menu (None)
- 'Fish Sample:' dropdown menu and an 'Add' button
- 'OK' and 'Cancel' buttons at the bottom



Lake Attitash - NEW04470-4155 Sampling Locations



Problems? What problems?

- Tough to use in sunlight
- Impossible to see wet screen
 - Umbrella a good accessory
- They don't float....
- Battery indicators lie...
- It'll never crash...
- Still beats paper!



Hardware

- PDA's, computers, tablets, laptops, iPhones, blackberry's, portable hard drives, smart pens, hand held computers
- Accessorizing
 - Flash drives, GPS, bluetooth, barcode scanners, GIS, external hard drive/cd, memory cards...
- Durability
 - Military specs?
 - GPS connector example
 - Other
 - Does it float?
 - What about sunlight, after dark?

STATION: A B C D E F G H I J DEPTH AT STATION: ft m

IF STATION WAS RELOCATED, INDICATE HERE: DROPPED:

LAKE SHORELINE SAMPLE COLLECTION FORM

SITE ID: NLA06608- DATE: / /

Sample ID	Sample Type*	No. of Jars	Flag	Comment

STATION	A	B	C	D	E	F	G	H	I	J
Substrate	Sub Coll	Sub Coll	Sub Coll	Sub Coll	Sub Coll	Sub Coll	Sub Coll	Sub Coll	Sub Coll	Sub Coll
Boat	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR
Wading	OM	OM	OM	OM	OM	OM	OM	OM	OM	OM
Organic/Fine beds	OF	OF	OF	OF	OF	OF	OF	OF	OF	OF
Leaf pack	OL	OL	OL	OL	OL	OL	OL	OL	OL	OL
Other: Note in Comments	OO	OO	OO	OO	OO	OO	OO	OO	OO	OO

Flag	Comment

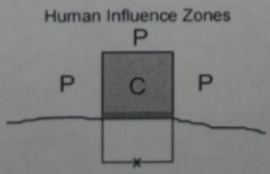
Flag codes: K = No measurement or observation made; U = Suspect measurement or observation; F1, F2, etc. = misc. flags assigned by field crew. Explain all flags in comment sections.

2007 Lake Shoreline Sample Col. 6/17/07

Submergent	0	1	2	3	4
Emergent	0	1	2	3	4
Floating	0	1	2	3	4
Total Aquatic Macrophyte Cover	0	1	2	3	4

Do macrophytes extend lakeward? Yes No

FISH COVER	Flag
Aquatic and Inundated Herbaceous Veg.	0 1 2 3 4
Woody Debris/Snags > 0.3 m Dia.	0 1 2 3 4
Woody Brush/Woody Debris <0.3 m dia. (alive or dead)	0 1 2 3 4
Inundated Live Trees >0.3 m dia	0 1 2 3 4
Overhanging Veg. within 1 m of Surface	0 1 2 3 4
Ledges or Sharp Dropoffs	0 1 2 3 4
Boulders	0 1 2 3 4
Human Structures- Docks, Landings, etc	0 1 2 3 4



Flag codes: K = No measurement or observation made; U = Suspect measurement or observation; F1, F2, etc. = misc. flags assigned by field crew. Explain all flags in comment sections.

BIOTIC ZONE

1 = Sparse (<10%) 2 = Moderate (10-40%)
 3 = Very Sparse (>75%)

PY (>5 m high) Flag

Broadleaf Evergreen Coniferous

None

BH) 0 1 2 3 4

RY (0.5 TO 5m high) Flag

Broadleaf Evergreen Coniferous

None

ngs) 0 1 2 3 4

jrbs) 0 1 2 3 4

COVER (<0.5 high) Flag

ngs) 0 1 2 3 4

jrbs) 0 1 2 3 4

sted tion) 0 1 2 3 4

ngs) 0 1 2 3 4

larger than a car) 0 1 2 3 4

Boulders (250-4000mm; basketball-car size) 0 1 2 3 4

Cobble (64-250mm; tennis ball-basketball size) 0 1 2 3 4

Gravel (2-64 mm; ladybug-tennis ball size) 0 1 2 3 4

Sand (0.06 - 2mm; gritty between fingers) 0 1 2 3 4

Silt, Clay, or Muck (<0.06mm; not gritty) 0 1 2 3 4

Woody Debris 0 1 2 3 4

Organic (Leaf Pack, Detritus) 0 1 2 3 4

Vegetation or Other 0 1 2 3 4

HUMAN INFLUENCE Flag

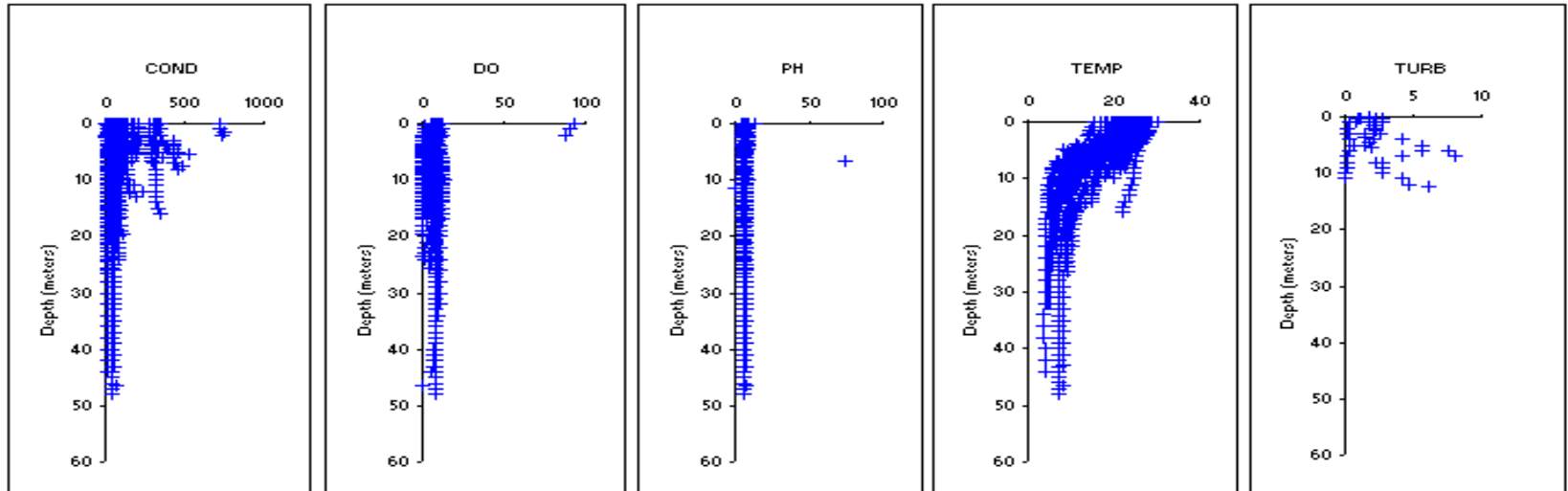
0 = Not Present P = Present outside plot C = Present within plot

Buildings	0	P	C
Commercial	0	P	C
Park Facilities/ Man-made beach	0	P	C
Docks/Boats	0	P	C
Walls, dikes or revetments	0	P	C
Landfill/Trash	0	P	C
Roads or Railroad	0	P	C
Power lines	0	P	C
Row Crops	0	P	C
Pasture/Rangel/Hay Field	0	P	C
Orchard	0	P	C
Lawn	0	P	C

G28 =CELL("row",INDEX(G32:G2979,MATCH(MAX(G32:G2979),G32:G2979,0)))

View CTD profiles in New England stations

2007 New England Lakes and Ponds



	COND	DO	PH	TEMP	TURB
max value	750	93.2	74	30.25	8
row# of max value	922	827	397	1153	716

➔ Select State or LakeName from dropdown menu

Max of Value	State	LakeName	Depth	Analyle	COND	DO	PH	TEMP	TURB
	ME	ME: Big Reed Pond	0.0		37	8.45	7.65	18	
			1.0		37	8.43	7.62	18	
			1.5		37	8.44	7.62	18	
			2.0		37	8.44	7.62	18	
			2.5		37	8.44	7.62	18	
			3.0		37	8.45	7.61	17.9	
			3.5		37	8.45	7.61	17.9	
			4.0		36	8.44	7.6	17.9	
			4.5		38	8.45	7.59	17.9	
			5.0		36	8.46	7.59	17.8	
			5.5		34	10.97	7.36	14.72	
			6.0		31	10.76	7.05	11.37	
			6.5		30	9.5	6.85	9.51	
			7.0		30	6.23	6.64	8	
			7.5		30	4.44	6.55	7.3	
			8.0		29	2.95	6.49	6.78	
			8.5		30	2.11	6.45	6.4	
			9.0		30	1.37	6.43	6.15	
			9.5		30	1.17	6.41	6.07	
			10.0		30	0.84	6.41	5.95	
			11.0		30	0.57	6.4	5.81	

pH (ME) DO (NH)

Bubble Map (symbol area proportional to value). Data in PT_DistBubble (below)

Make Selections ←

Select Parameter: Chlorophyll a(ug/L) | Select EPA Region: Region_1

Show only first visits to a station

→ **Top Ten "worst sites"**

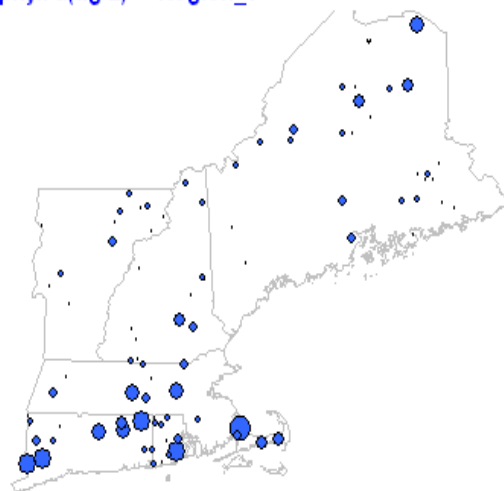
EPA_REG: Region_1

Check boxes to temporarily disable dominating values

Check boxes of extreme values.	Max Value	LOC_NAME	ST	Total
<input type="checkbox"/>		Halfway Pond	MA	31.36
<input type="checkbox"/>		Roseland Lake	CT	26.424
<input type="checkbox"/>		Belleville Pond	RI	24.32
<input type="checkbox"/>		Lake Zoar	CT	22.72
<input type="checkbox"/>		Lake Kenosia	CT	21.888
<input type="checkbox"/>		Cusky Pond	MA	16.8
<input type="checkbox"/>		Long Lake, St. Agatha	ME	16.16
<input type="checkbox"/>		Union Pond	CT	15.696
<input type="checkbox"/>		Knowlton Pond	CT	14.96
<input type="checkbox"/>		Gristmill Pond	MA	14.944

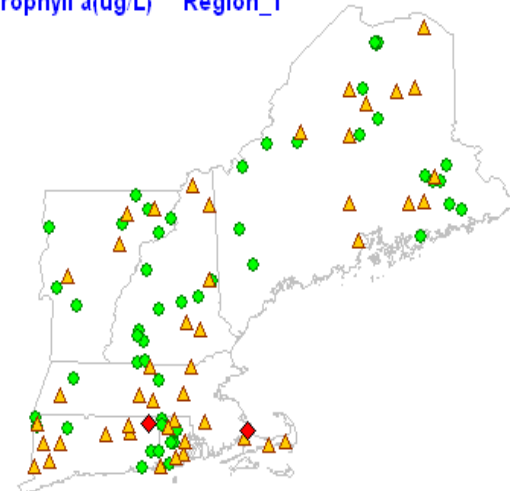
Press Here To Reset All Disabled Sites

Chlorophyll a(ug/L) Region_1



2007 Northeast Lakes & Ponds

Chlorophyll a(ug/L) Region_1

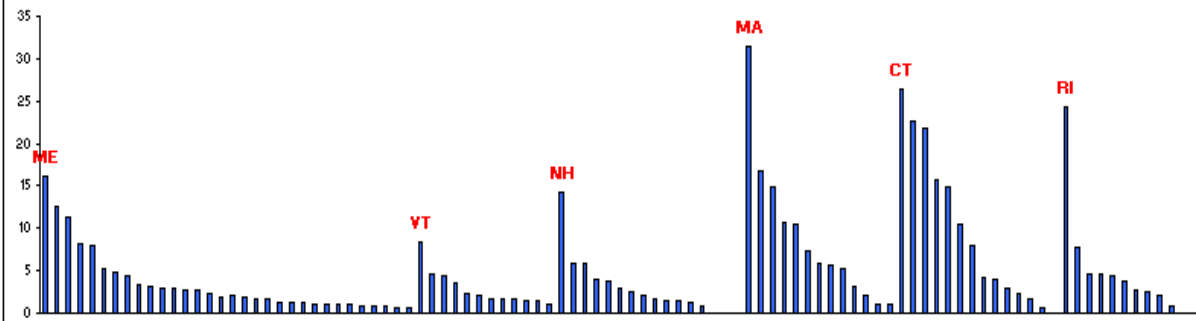


2007 Northeast Lakes & Ponds

Distribution plot: Presents values in decreasing order by state. Data are located in PT_DistBubble (below)

Chlorophyll a(ug/L) Region_1

2007 Northeast Lakes & Ponds



Percentiles of National Data
 Custom Thresholds

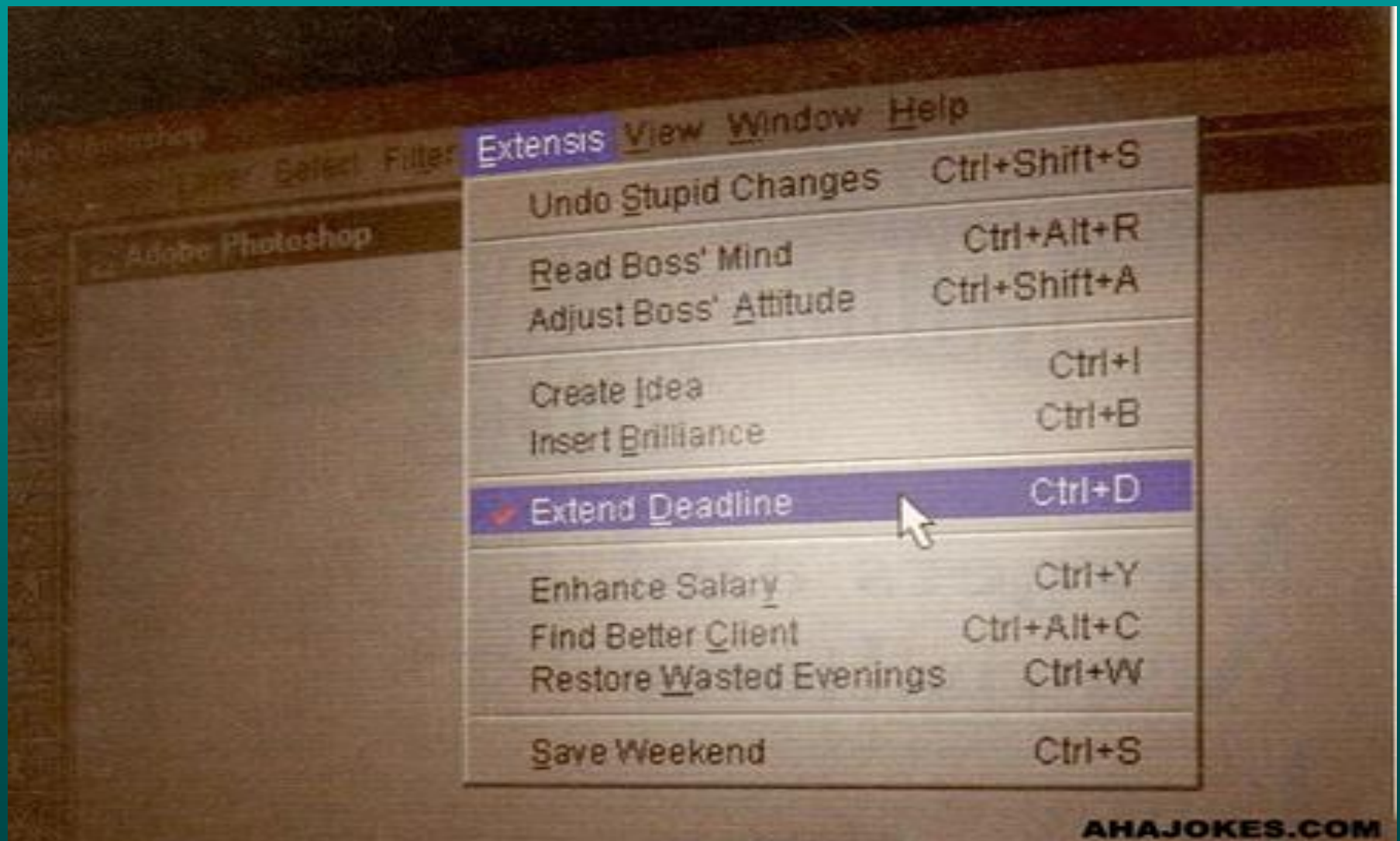
Analyte: CHLA
 ChemName: Chlorophyll a(ug/L)
 Units: ug/L
 25%ile: 2.872
 75%ile: 25.44
 Custom T1: 5
 Custom T2: 50

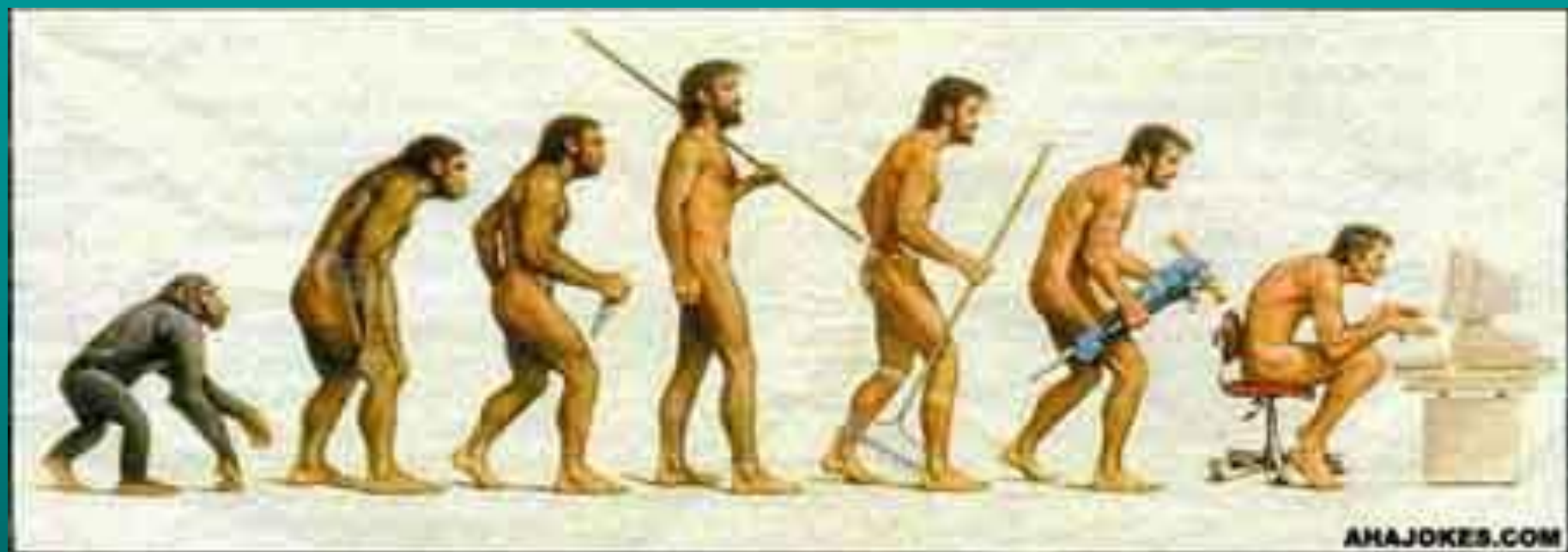
PT_DistBubble; data used to create plots above

EPA_REG: Region_1

Chlorophyll a(ug/L) Region_1

Electronic Data Capture will solve all your problems...





AHAJOKES.COM

- Got batteries?
- Garbage in garbage out
- Can you get out what you put in?
 - Ability to query and utilize collected information

- What do you plan to do with the data?
- How much data?
- Where will it go?
- Conditions you'll be collecting data in?
- Who will manage the data?
- Do you need to manage the data?
- Hardware?
- ORD scanning forms VS electronic data capture

- “If you are not going to use the data...don’t collect it in the first place.”

