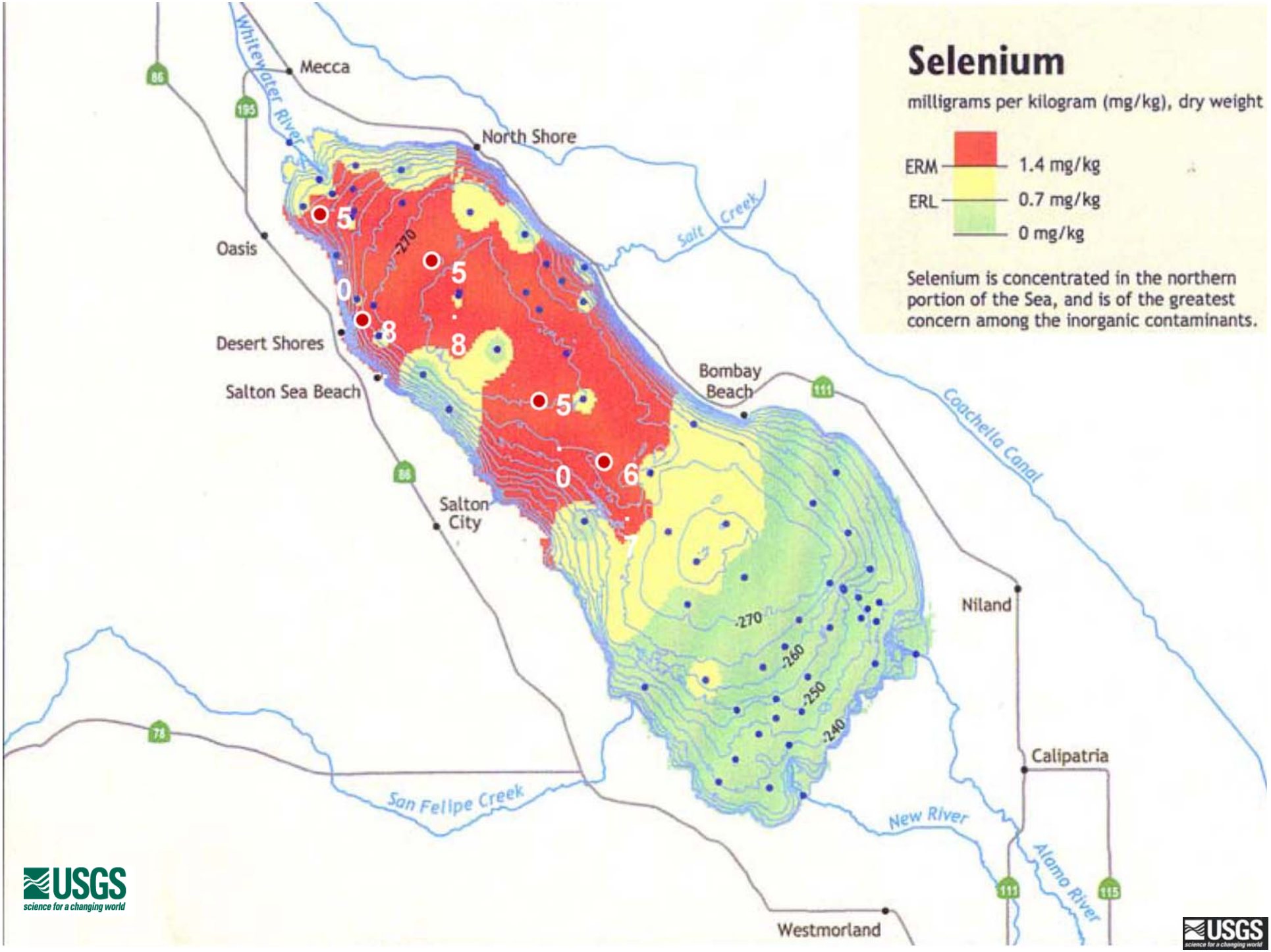
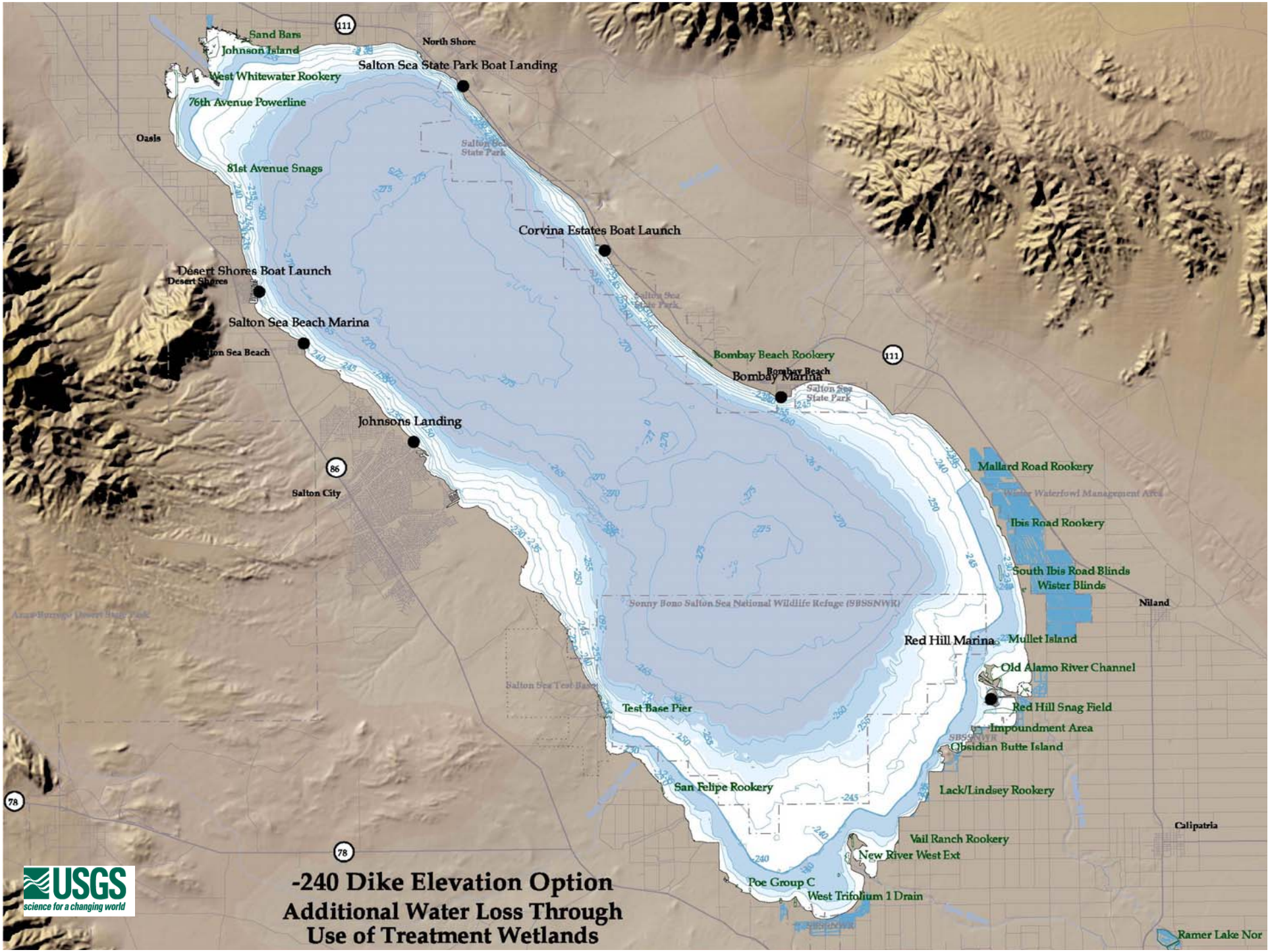
Selenium and organic matter in shallow sediments of the Salton Sea

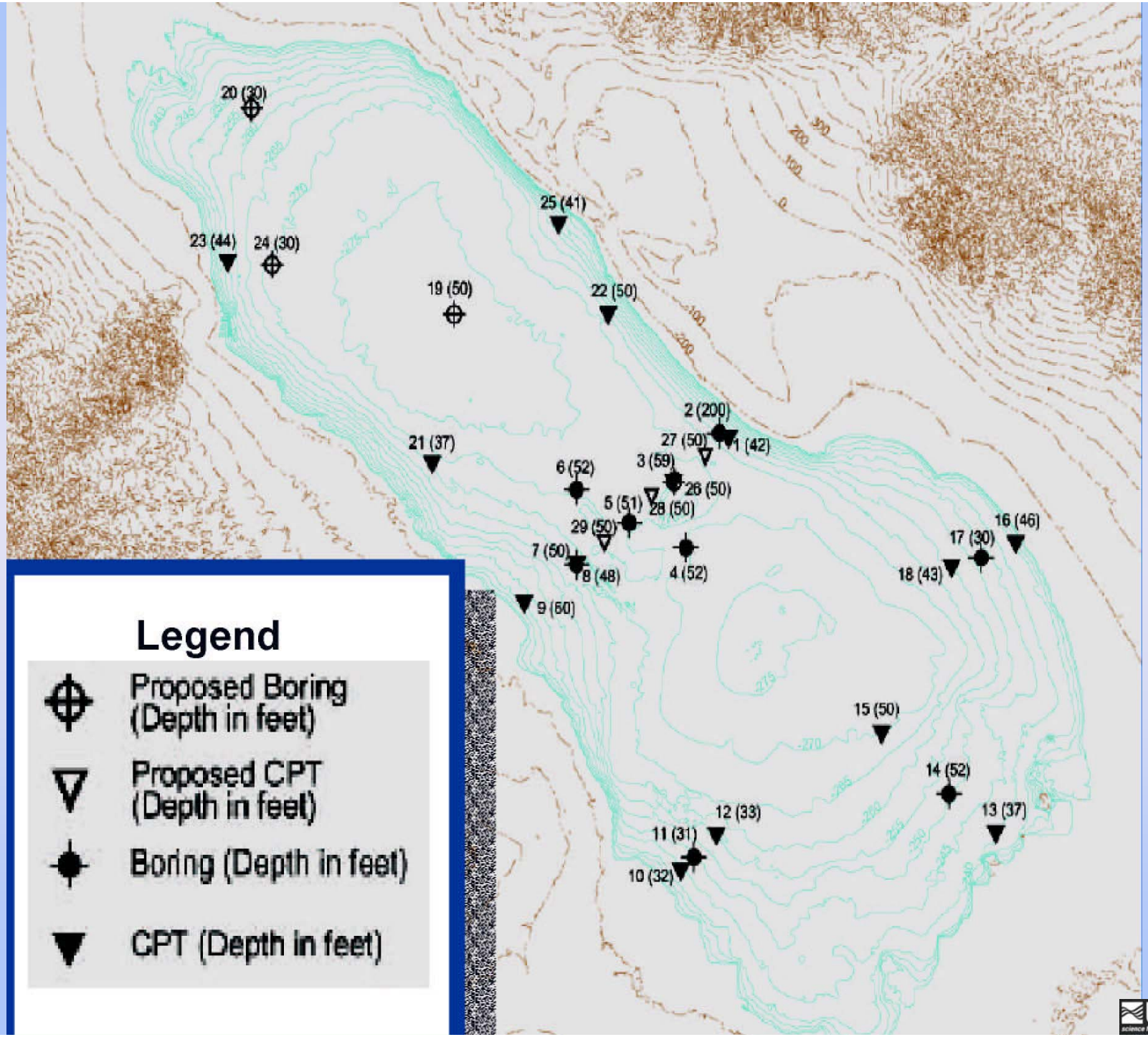
January 14, 2005

Douglas A. Barnum

USGS Salton Sea Science Office


Selenium
milligrams per kilogram (mg/kg), dry weight
ERM 1.4 mg/kg
ERL 0.7 mg/kg
0 mg/kg
Selenium is concentrated in the northern portion of the Sea, and is of the greatest concern among the inorganic contaminants.
Mecca
North Shore
Oasis
Desert Shores
Salton Sea Beach
Bombay Beach
Salton City
Niland
Calipatria
Westmorland
Whitewater River
Salt Creek
Coachella Canal
San Felipe Creek
New River
Alamo River
-270
-260
-250
-240
5
0
8
5
8
5
0
6
7
86
195
111
78
115


Sand Bars
Johnson Island
West Whitewater Rookery
76th Avenue Powerline
Oasis
81st Avenue Snags
North Shore
Salton Sea State Park Boat Landing
Corvina Estates Boat Launch
Desert Shores Boat Launch
Desert Shores
Salton Sea Beach Marina
Salton Sea Beach
Johnsons Landing
Salton City
Bombay Beach Rookery
Bombay Beach
Bombay Marina
Salton Sea State Park
Mallard Road Rookery
Ibis Road Rookery
South Ibis Road Blinds
Wister Blinds
Niland
Sonny Bono Salton Sea National Wildlife Refuge (SBSSNWR)
Red Hill Marina
Mullet Island
Old Alamo River Channel
Red Hill Snag Field
Impoundment Area
Obsidian Butte Island
Test Base Pier
San Felipe Rookery
Lack/Lindsey Rookery
Calipatria
Vail Ranch Rookery
New River West Ext
Poe Group C
West Trifolium 1 Drain
Ramer Lake Nor
USGS
science for a changing world
-240 Dike Elevation Option
Additional Water Loss Through
Use of Treatment Wetlands


20 (30)
25 (41)
23 (44)
24 (30)
19 (50)
22 (50)
2 (200)
27 (50)
1 (42)
21 (37)
3 (59)
6 (52)
26 (50)
5 (51)
28 (50)
29 (50)
16 (46)
17 (30)
7 (50)
8 (48)
4 (52)
18 (43)
9 (60)
15 (50)
14 (52)
12 (33)
13 (37)
11 (31)
10 (32)
Legend
Proposed Boring (Depth in feet)
Proposed CPT (Depth in feet)
Boring (Depth in feet)
CPT (Depth in feet)

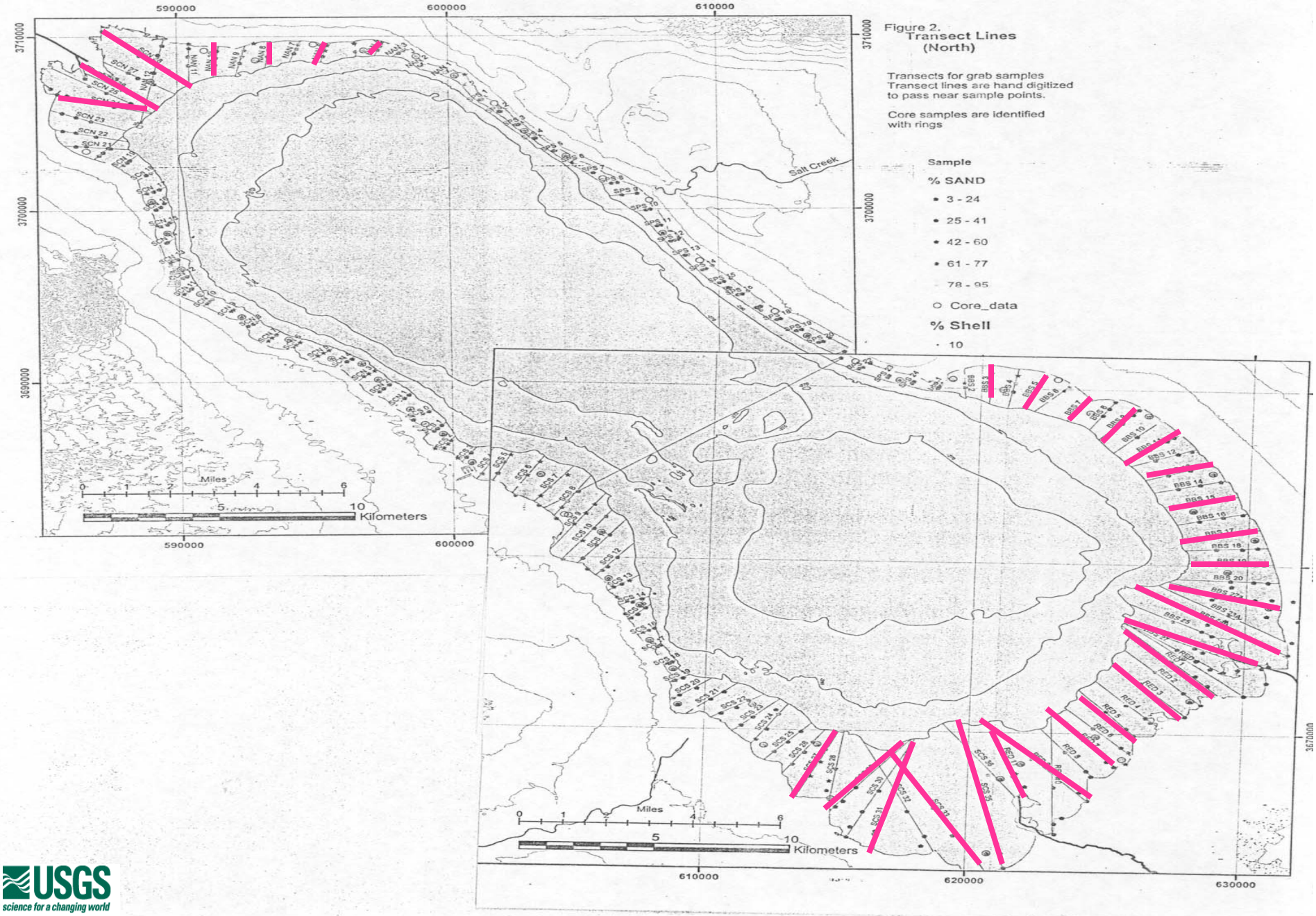


Figure 2.
Transect Lines
(North)

Transects for grab samples
Transect lines are hand digitized
to pass near sample points.

Core samples are identified
with rings

Sample

% SAND

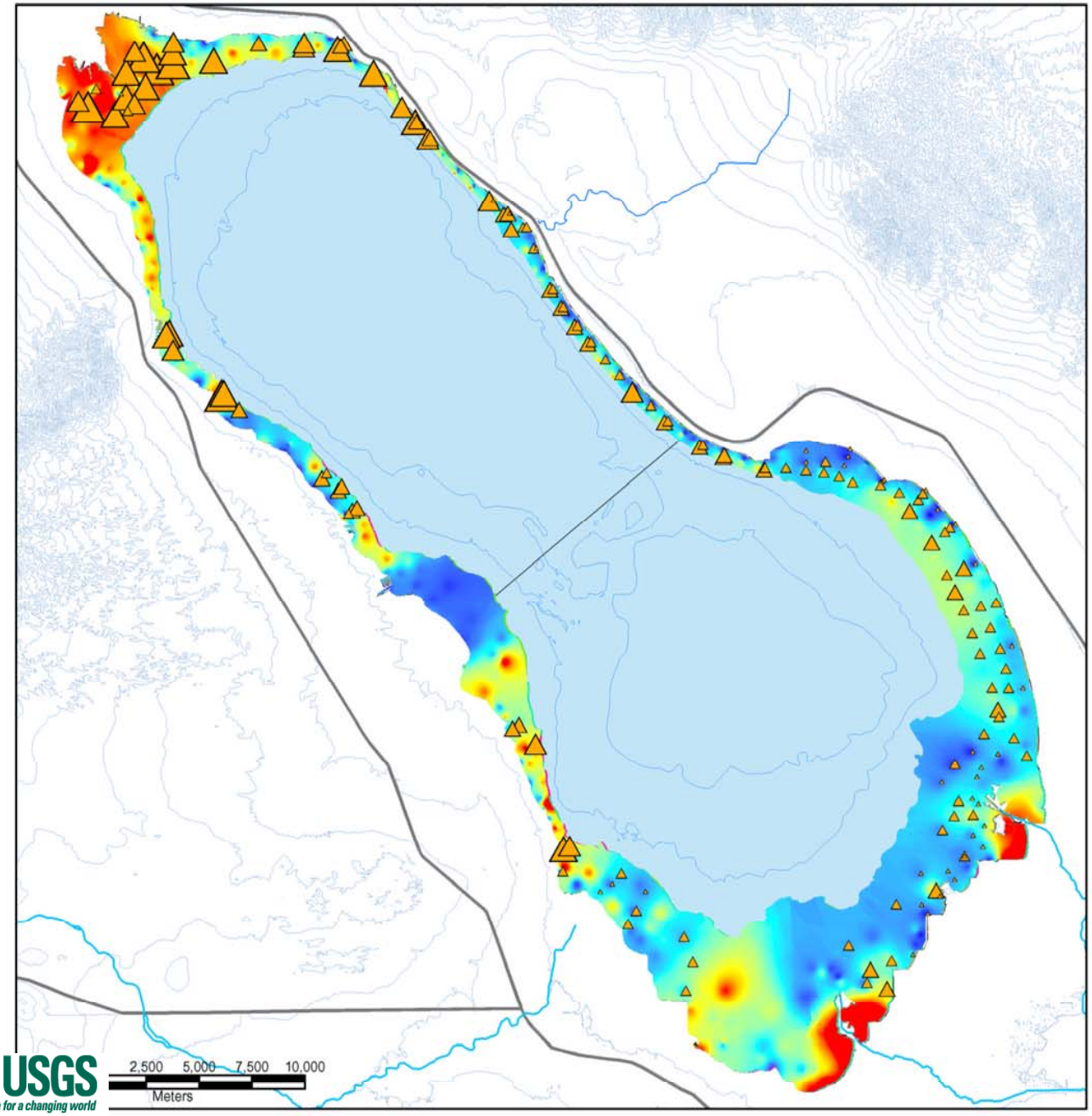
- 3 - 24
- 25 - 41
- 42 - 60
- 61 - 77
- 78 - 95

○ Core_data

% Shell

· 10

USGS
science for a changing world



Selenium mc/g dry weight
Organic % fraction

Selenium Results
OM Grid interpolation

SE

- 0.2 - 0.8
- 0.9 - 1.5
- 1.6 - 2.4
- 2.5 - 3.5
- 3.6 - 5.3
- 5.4 - 7.6

omidw

Value

High 24%

Low : <0.05%

Miles
0 1 2 4 6

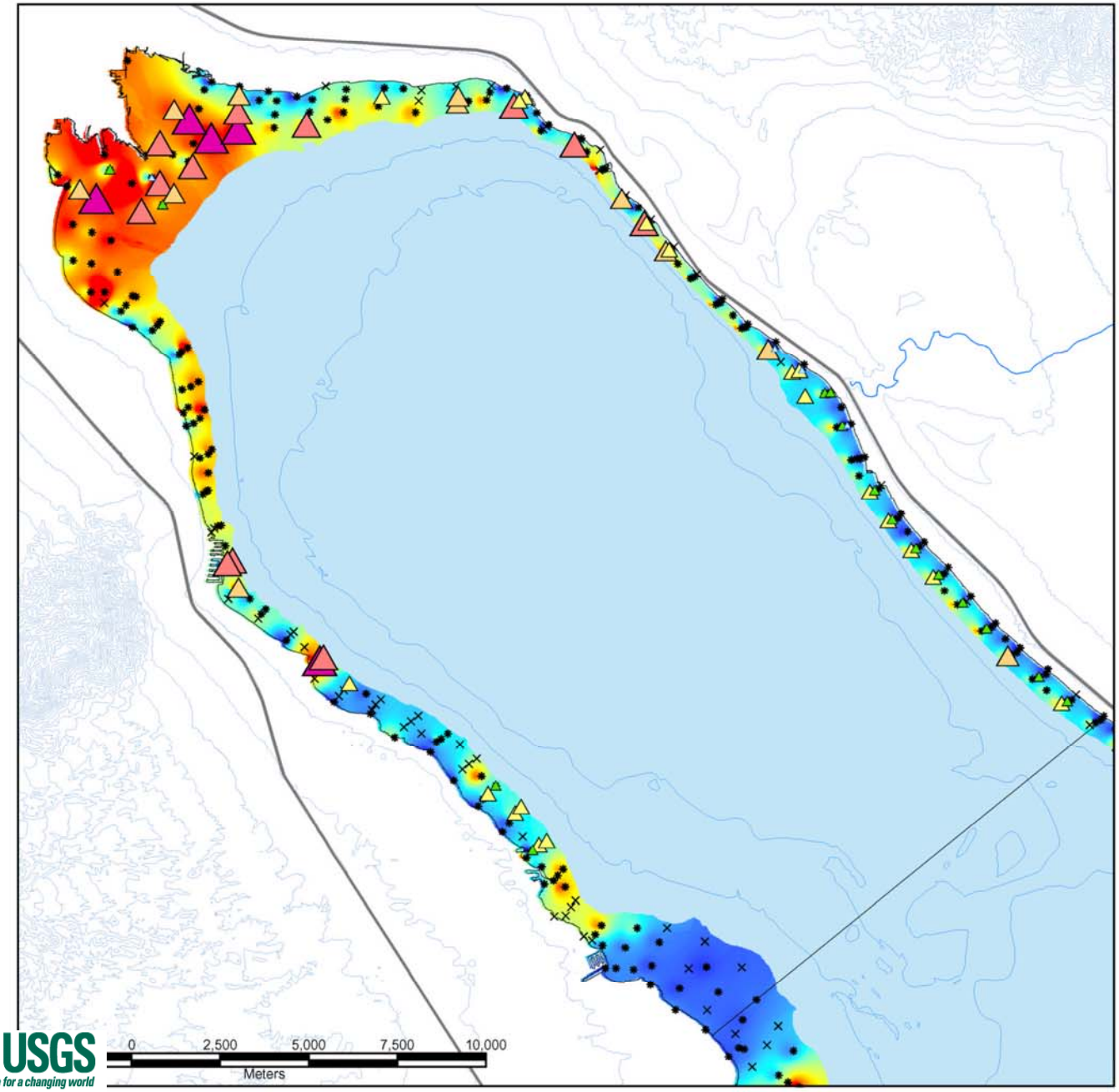
Projection: UTM Zone 11N,
Datum: NAD 1927
Base Map: SS Digital Atlas

N

Salton Sea Sediment Mapping

Dec 22, 2004
Agrarian Research
Data: Dr. Stephen Crooks
James Kulpa
Se: LET Analysis Lab
GIS: John Chesnut
Scale: 1:251,358

USGS
science for a changing world



Selenium mc/g dry weight
Organic % fraction

Selenium Results
OM Grid interpolation

Sample Data

- Sample
- No Recovery

Organic Fraction

Value

High 24%

Low : <0.05%

Selenium mg/g

- 0.2 - 0.8
- 0.9 - 1.5
- 1.6 - 2.4
- 2.5 - 3.5
- 3.6 - 5.3
- 5.4 - 7.6

Miles
0 0.5 1 2 3

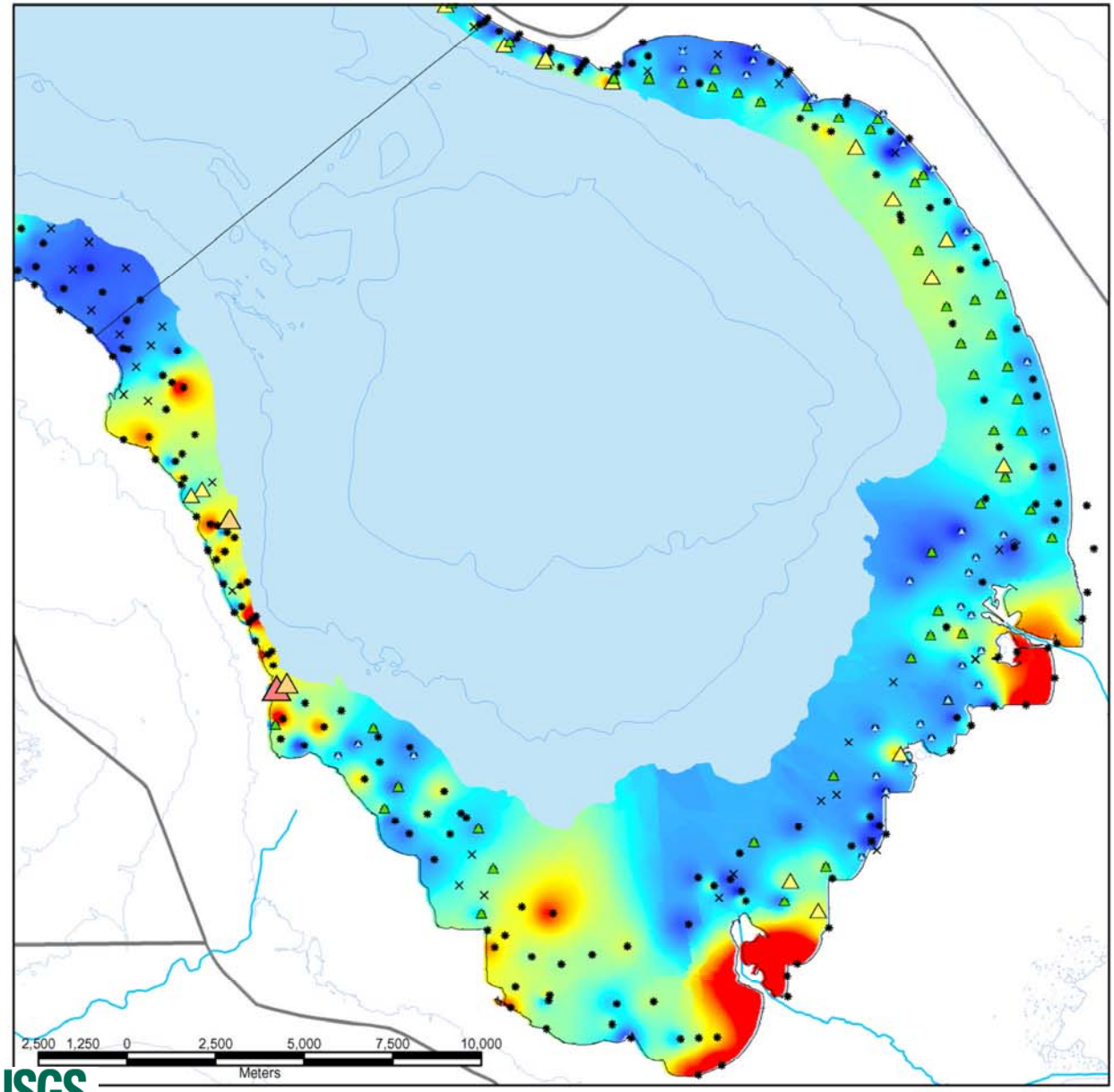
Projection: UTM Zone 11N,
Datum: NAD 1927
Base Map: SS Digital Atlas

N

Salton Sea Sediment Mapping

Dec 22, 2004
Agrarian Research
Data: Dr. Stephen Crooks
James Kulpa
Se: LET Analysis Lab
GIS: John Chesnut
Scale: 1:153,693

USGS
science for a changing world



Selenium mc/g dry weight
Organic % fraction

Selenium Results
OM Grid interpolation

Sample Data

- Sample
- No Recovery

Organic Fraction

Value

High 24%

Low : <0.05%

Selenium mg/g

- 0.2 - 0.8
- 0.9 - 1.5
- 1.6 - 2.4
- 2.5 - 3.5
- 3.6 - 5.3
- 5.4 - 7.6

Miles
0 0.5 1 2 3

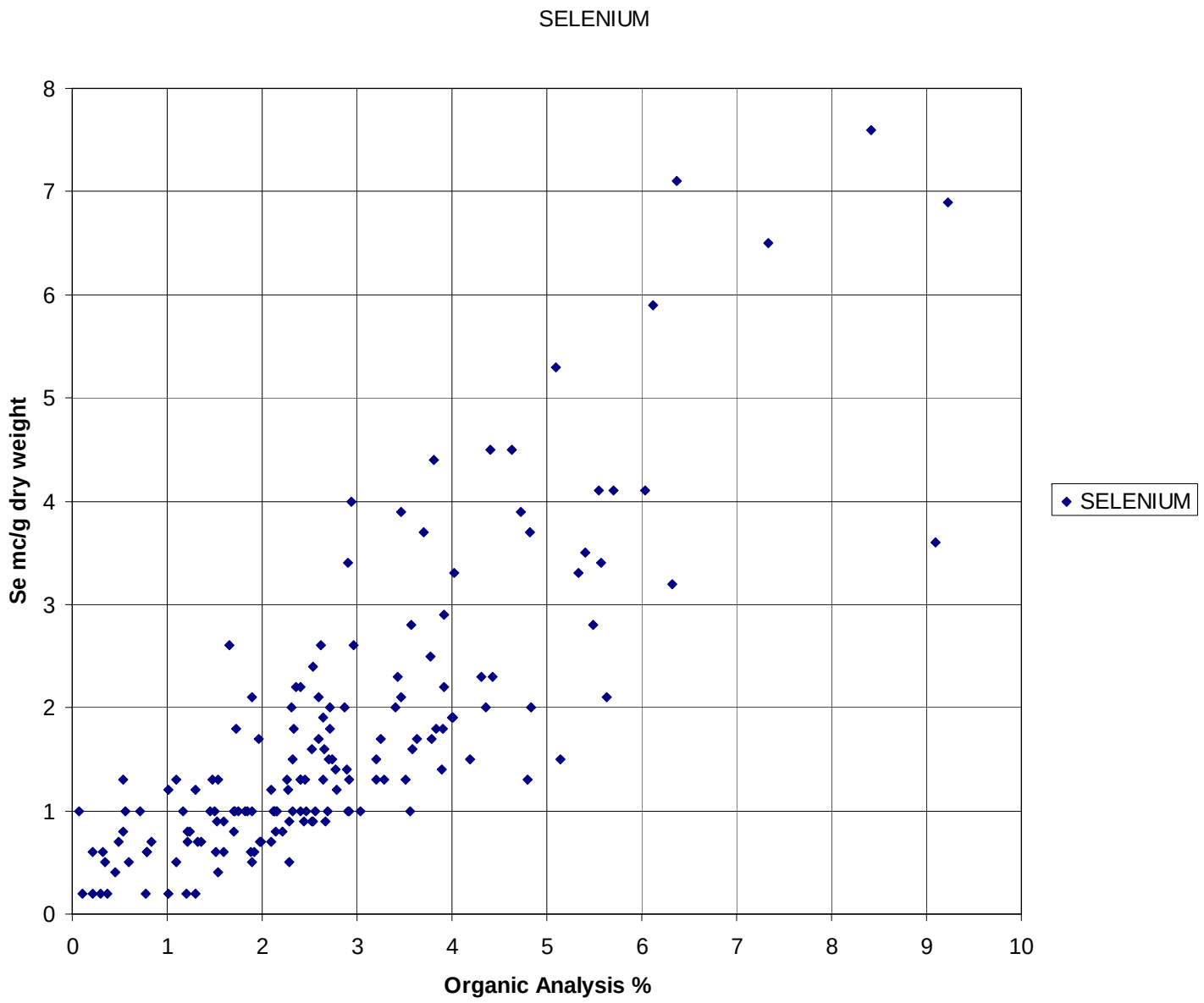
Projection: UTM Zone 11N,
Datum: NAD 1927
Base Map: SS Digital Atlas

N

Salton Sea Sediment Mapping

Dec 22, 2004
Agrarian Research
Data: Dr. Stephen Crooks
James Kulpa
Se: LET Analysis Lab
GIS: John Chesnut
Scale: 1:153,693

USGS
science for a changing world


SELENIUM
Se mc/g dry weight
Organic Analysis %
0
1
2
3
4
5
6
7
8
9
10
SELENIUM