

Assessment of *Corbicula fluminea* as a Potential Freshwater Bioaccumulative Test Species

Study Participants:

NWP- Mark Siipola, Tim Sherman,
Donna Ebner, Ruth Abney with field
collection help by Wendy Briner and Jim
Britton

ERDC- Jeff Steevens, Joan Clark, and
Gary Ray

Corbicula fluminea (Asian clam)

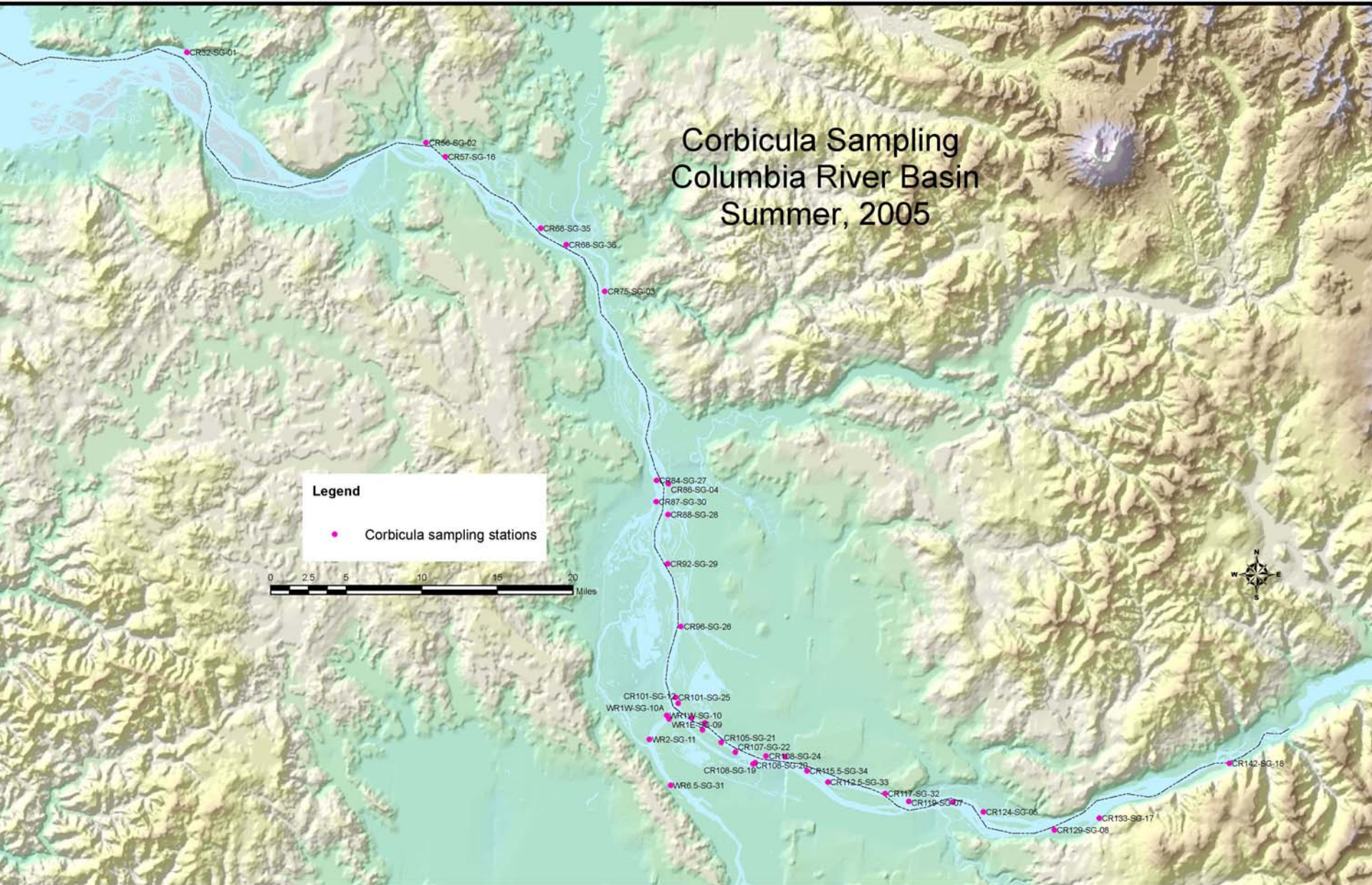
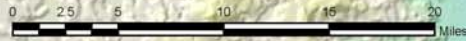
Purpose

- Characterize contaminant body burdens in the Columbia River and Lower Willamette Rivers
- Assess use of *Corbicula* sp. as an indicator and bioaccumulation species
- Assess use of *Corbicula* sp. as a tool to identify contaminant sources
- Determine distribution of contamination
- Integrate *Corbicula* sp. assessment with other ongoing and future CR monitoring and assessment efforts

Corbicula Sampling Columbia River Basin Summer, 2005

Legend

● Corbicula sampling stations















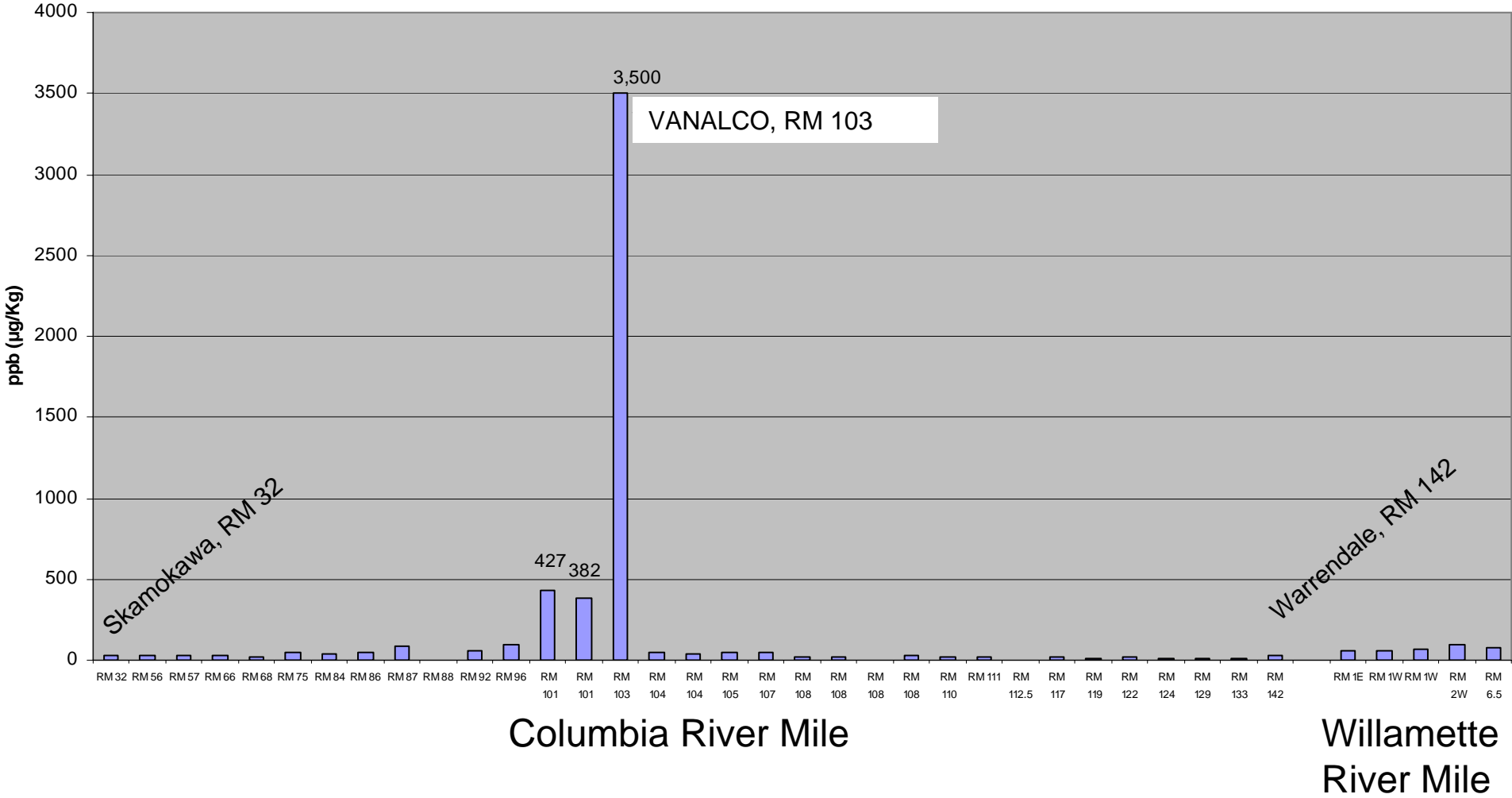


Bioaccumulative Analytes

- Semivolatile Compounds
- Pesticides/PCBs (Aroclors)
- PCB Congeners (all 209 Congeners)
- PBDEs (Fire Retardants)
- Organotin (TBT)
- Metals – Hg, Pb, Zn, Cd
- also Lipid Content

Clam PCBs.xls - PCBs!A1

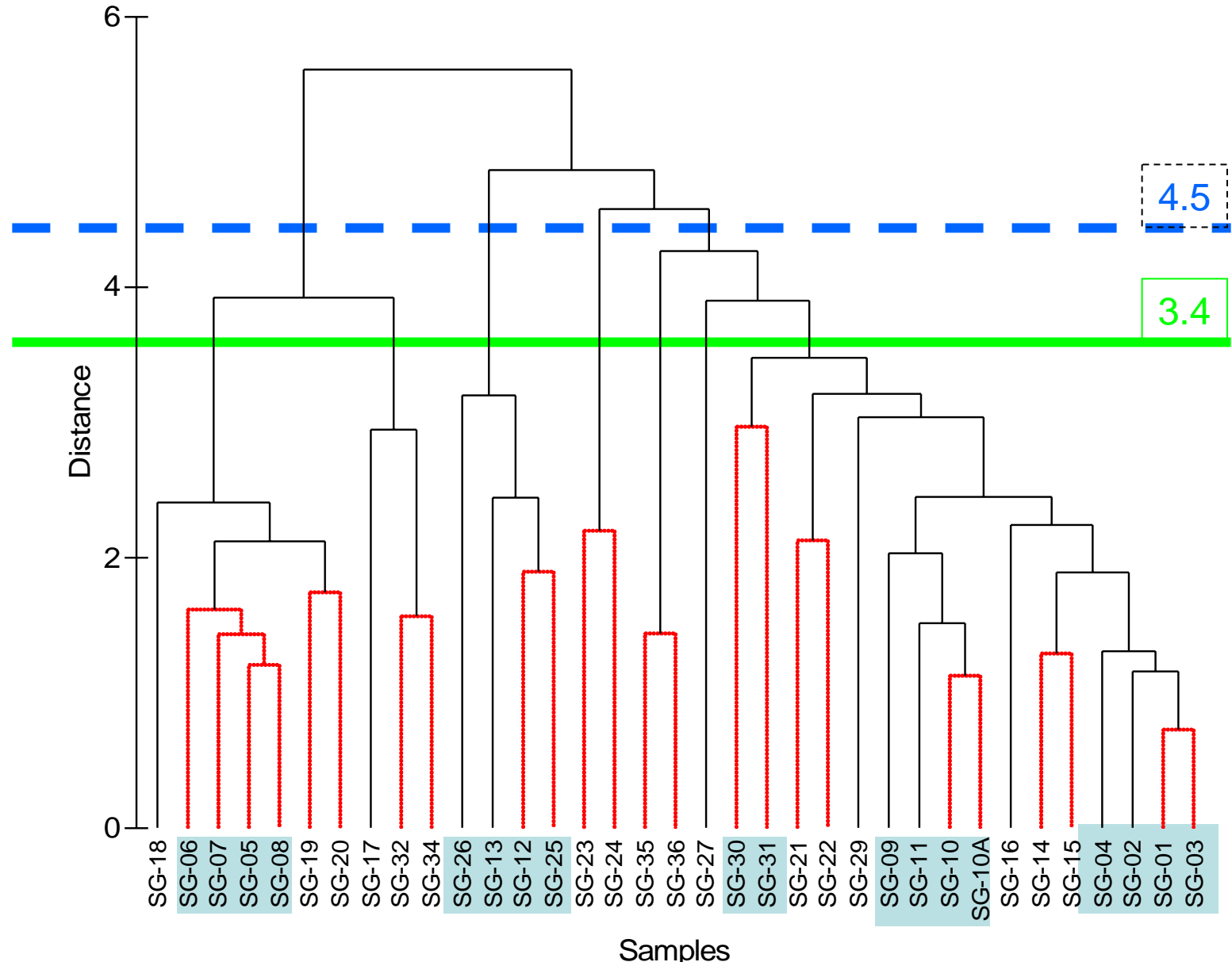
Total PCB Based Upon Congener Analysis (209)



Lipid Normalized PCB's

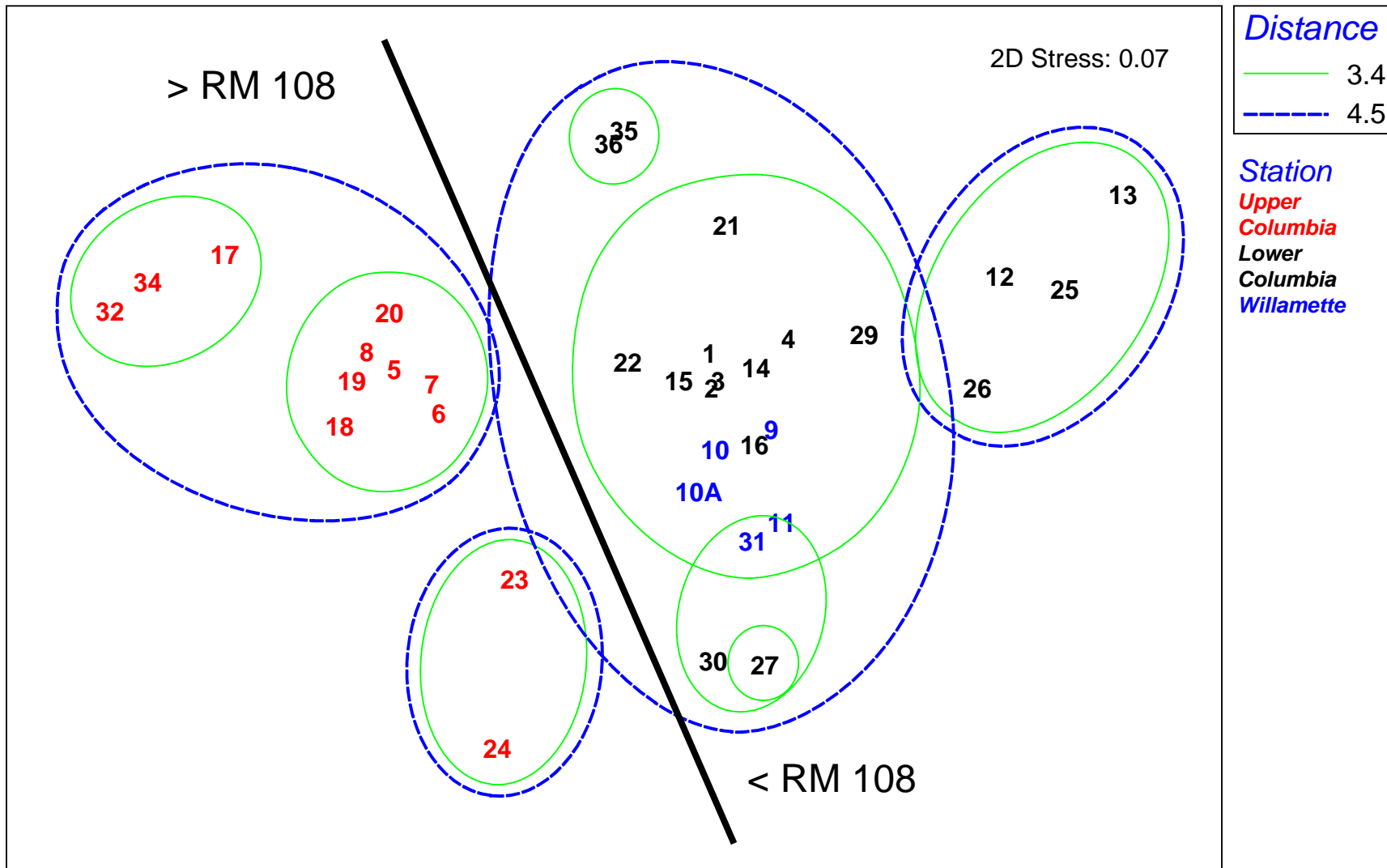
Group average

Standardise Samples by Total
Transform: Square root
Resemblance: D1 Euclidean distance



Lipid Normalized PCB's

Standardise Samples by Total
 Transform: Square root
 Resemblance: D1 Euclidean distance

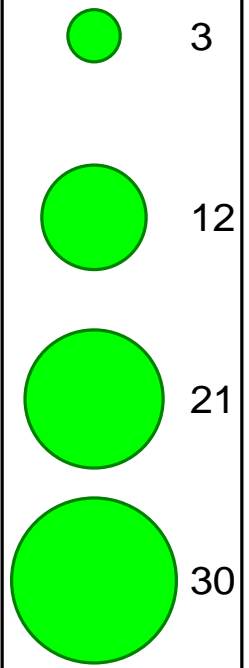
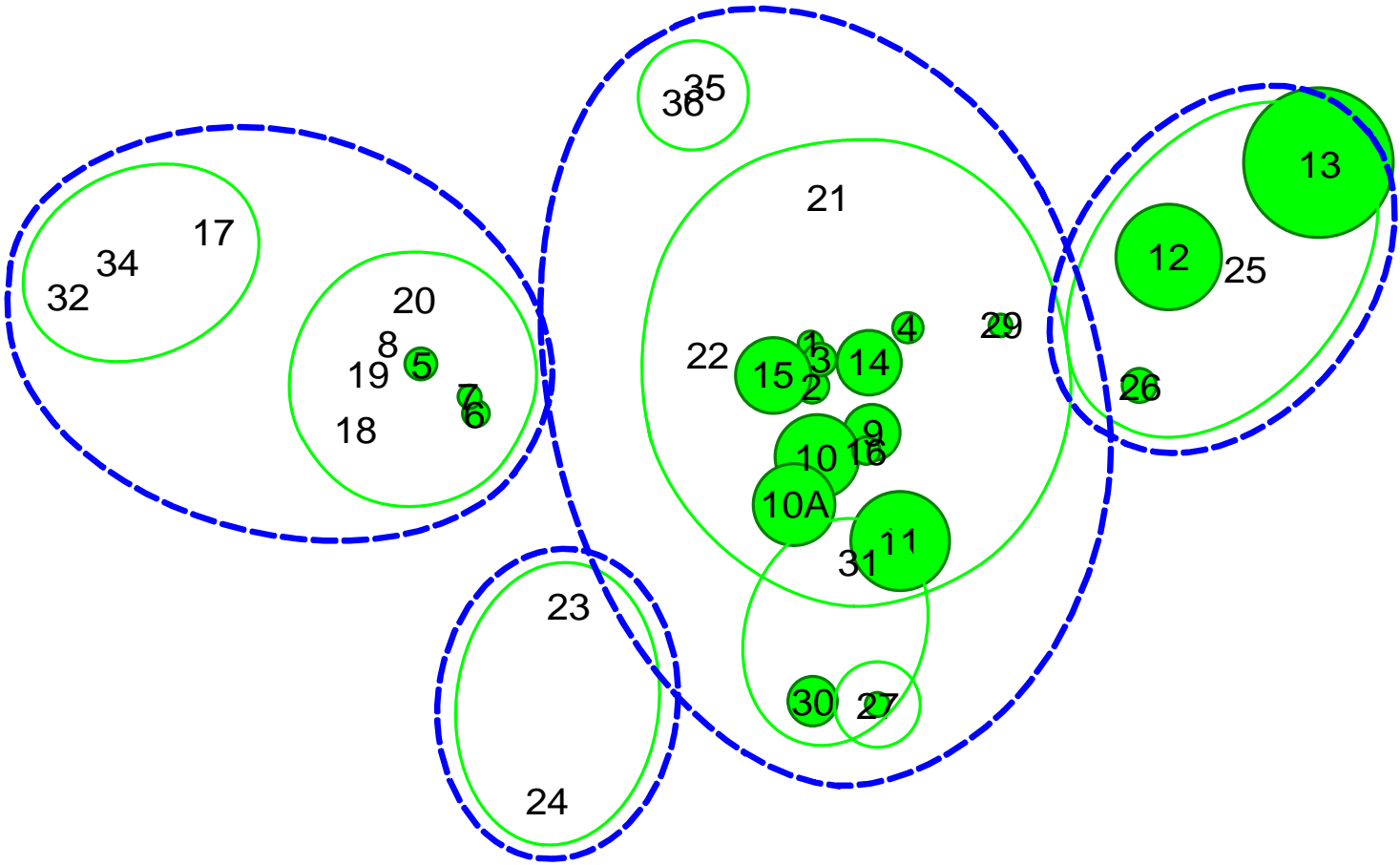


Lipid Normalized PCB's

Standardise Samples by Total
Transform: Square root
Resemblance: D1 Euclidean distance

2D Stress: 0.07

PCB201



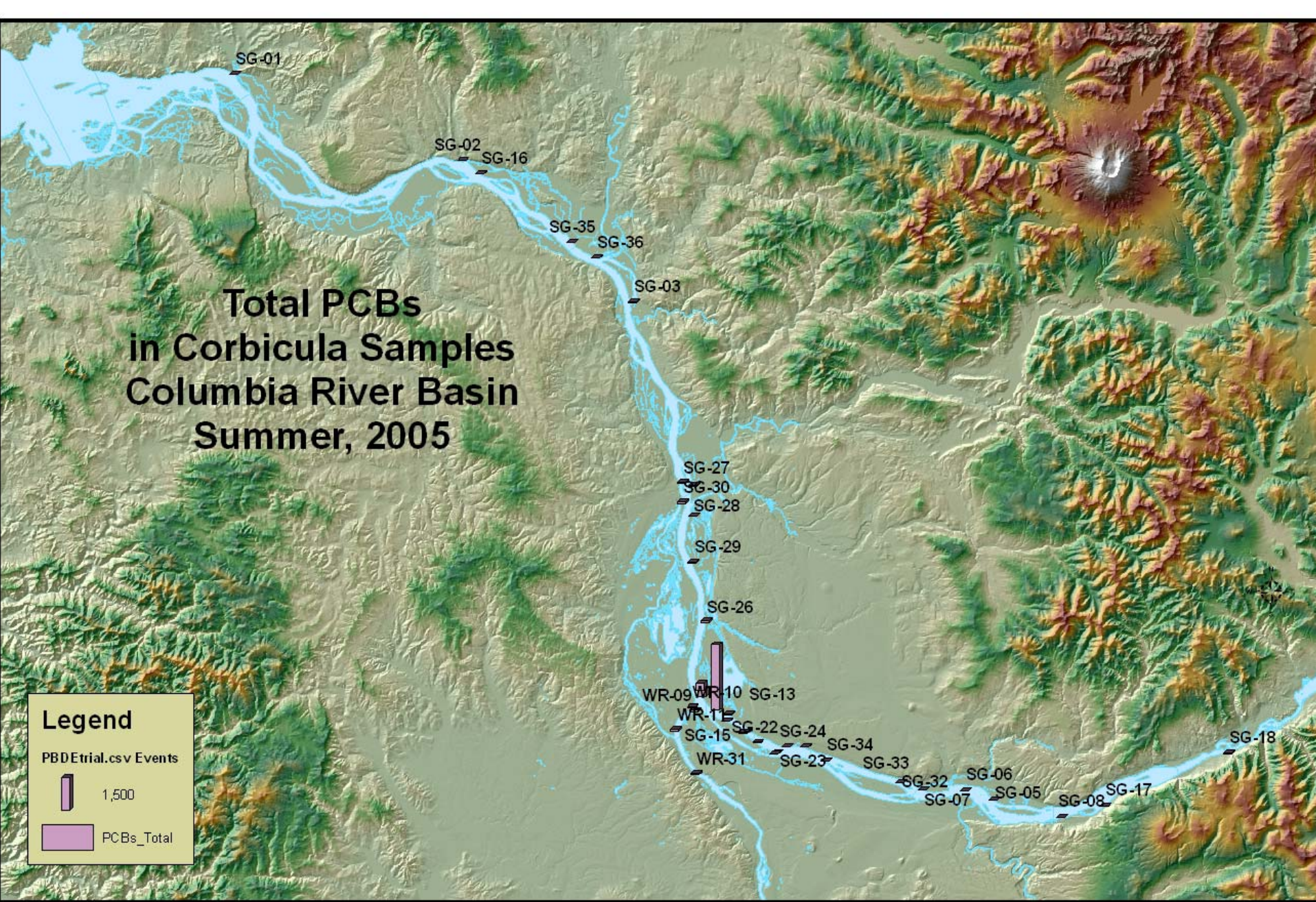
Total PCBs in Corbicula Samples Columbia River Basin Summer, 2005

Legend

PBDEtrial.csv Events

1,500

PCBs_Total



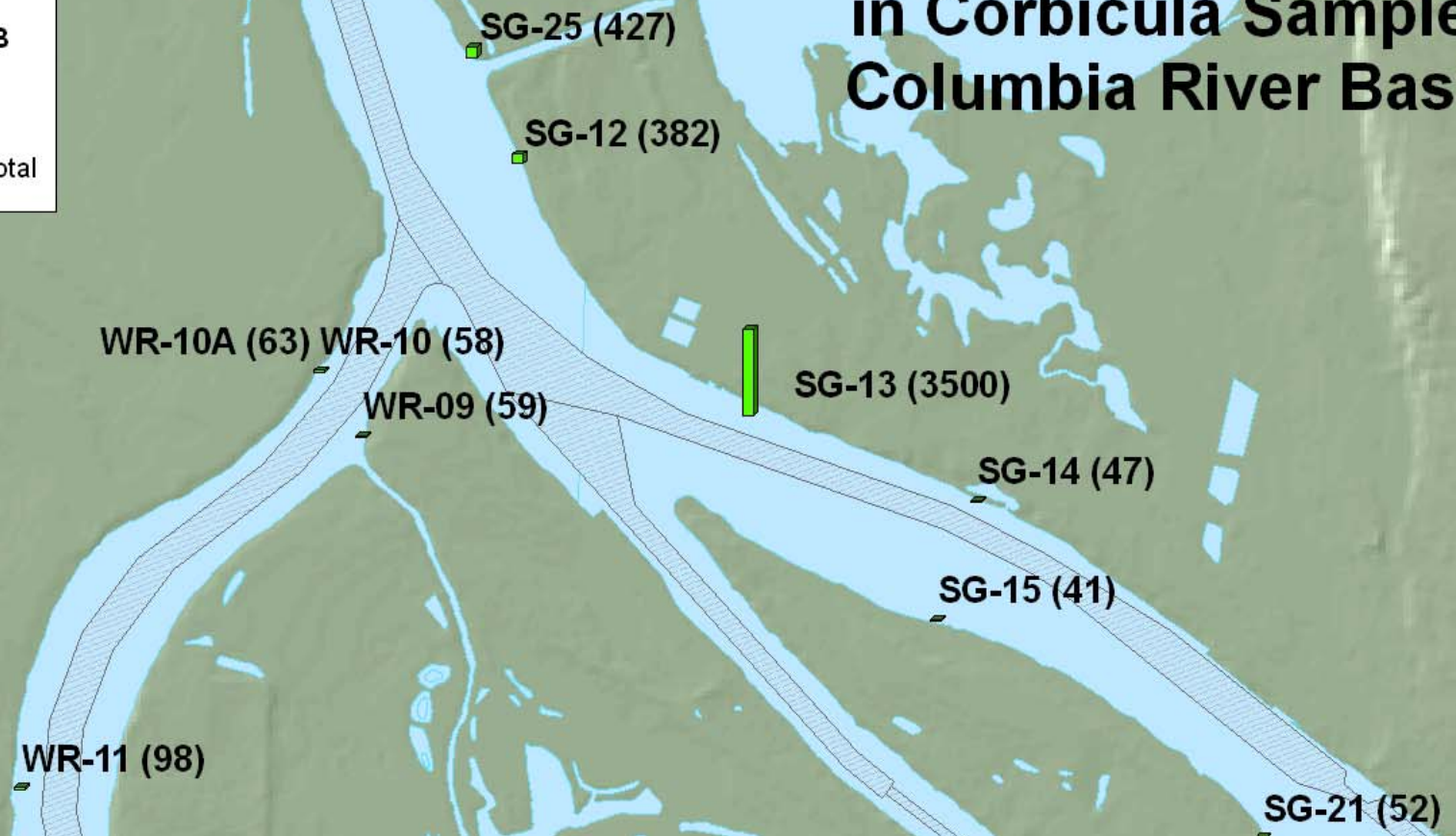
Total PCBs in Corbicula Samples Columbia River Basin

Legend

Total PCBs in PPB

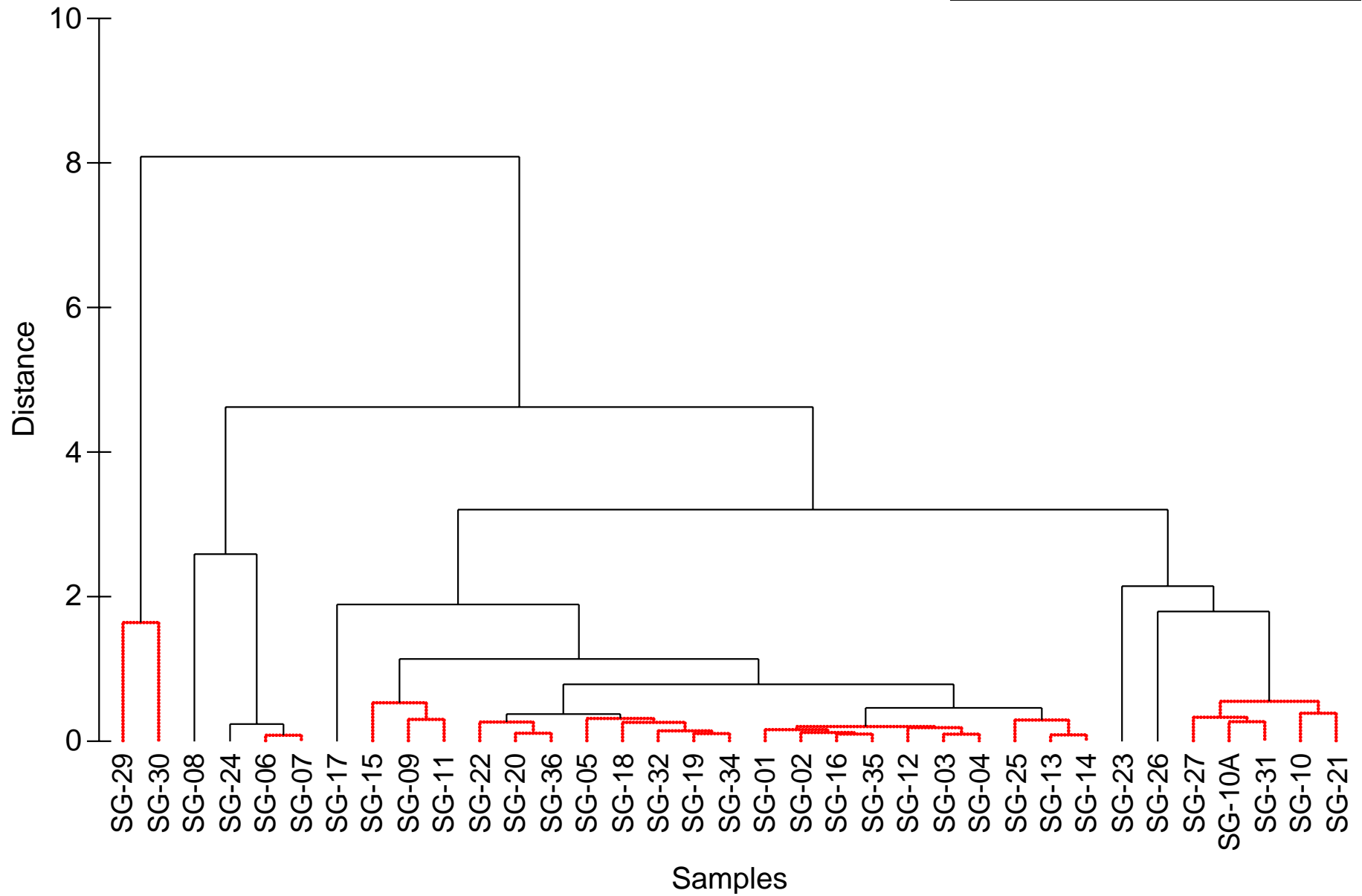
1,800

PCBs_Total



Lipid Normalized PBDE's
Group average

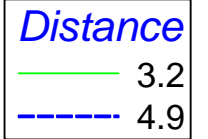
Transform: Fourth root
Resemblance: D1 Euclidean distance



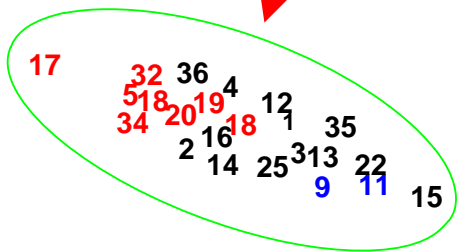
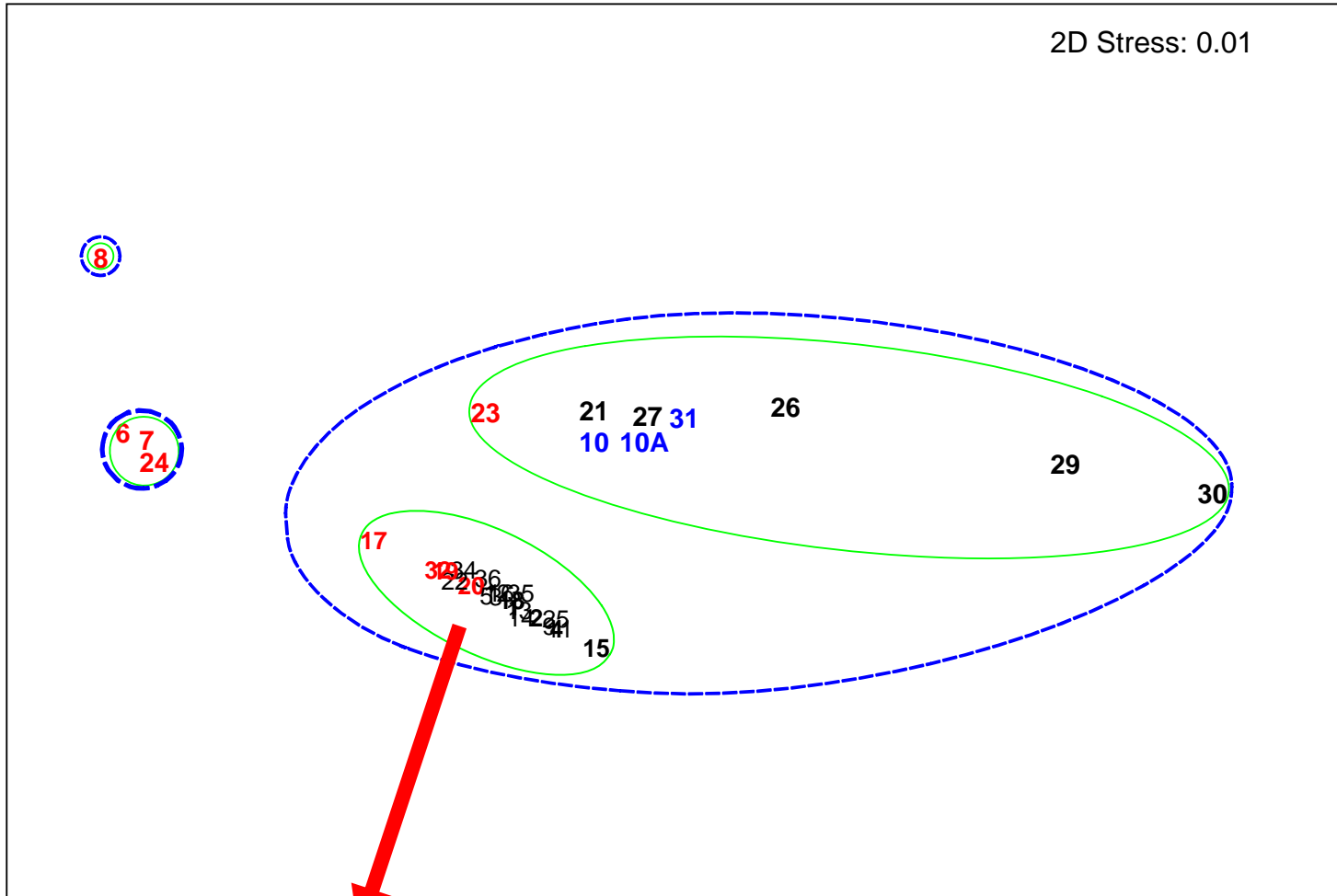
Lipid Normalized PBDE's

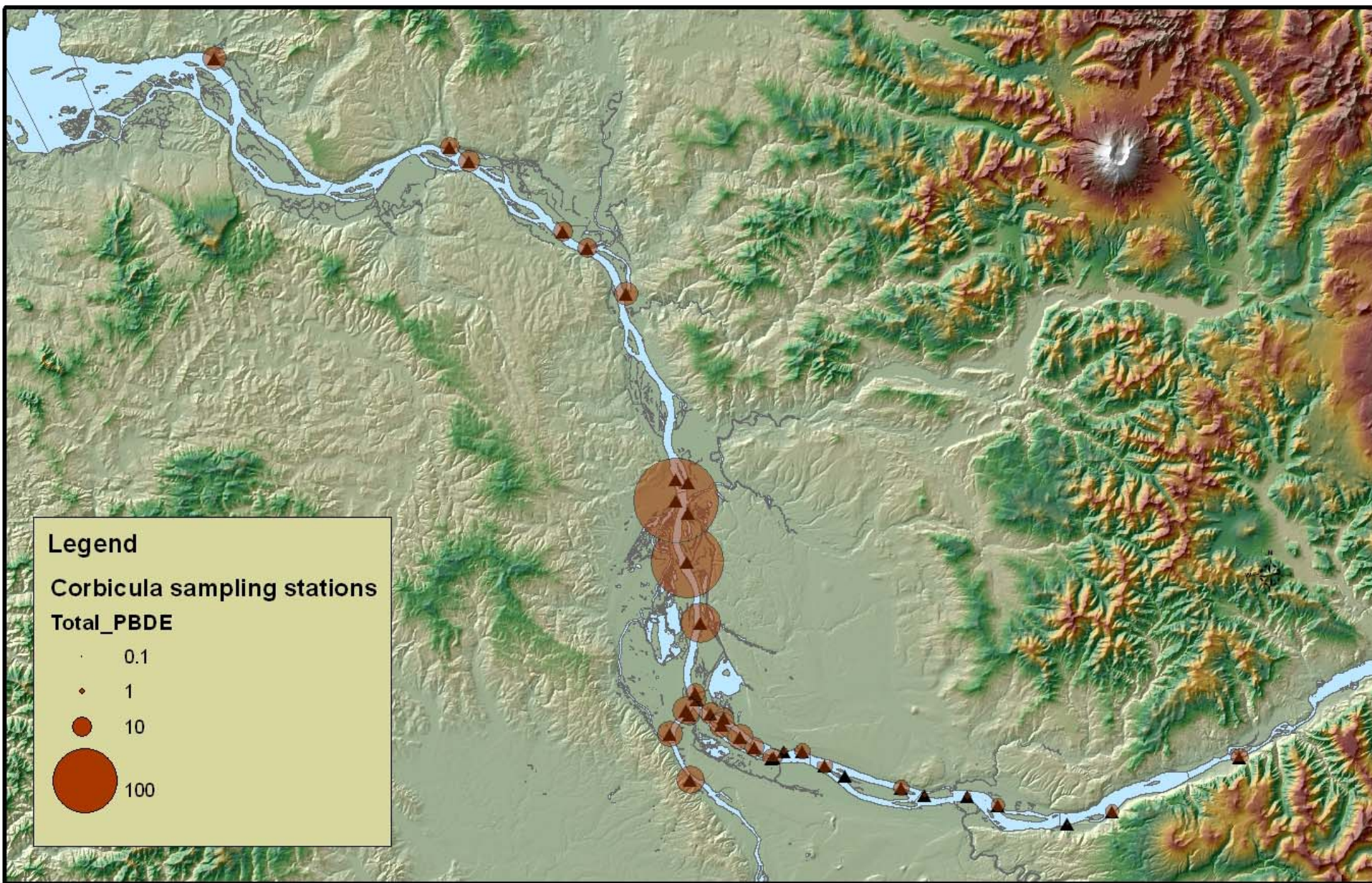
Transform: Fourth root
Resemblance: D1 Euclidean distance

2D Stress: 0.01



Station
Lower
Columbia
Upper
Columbia
Willamette

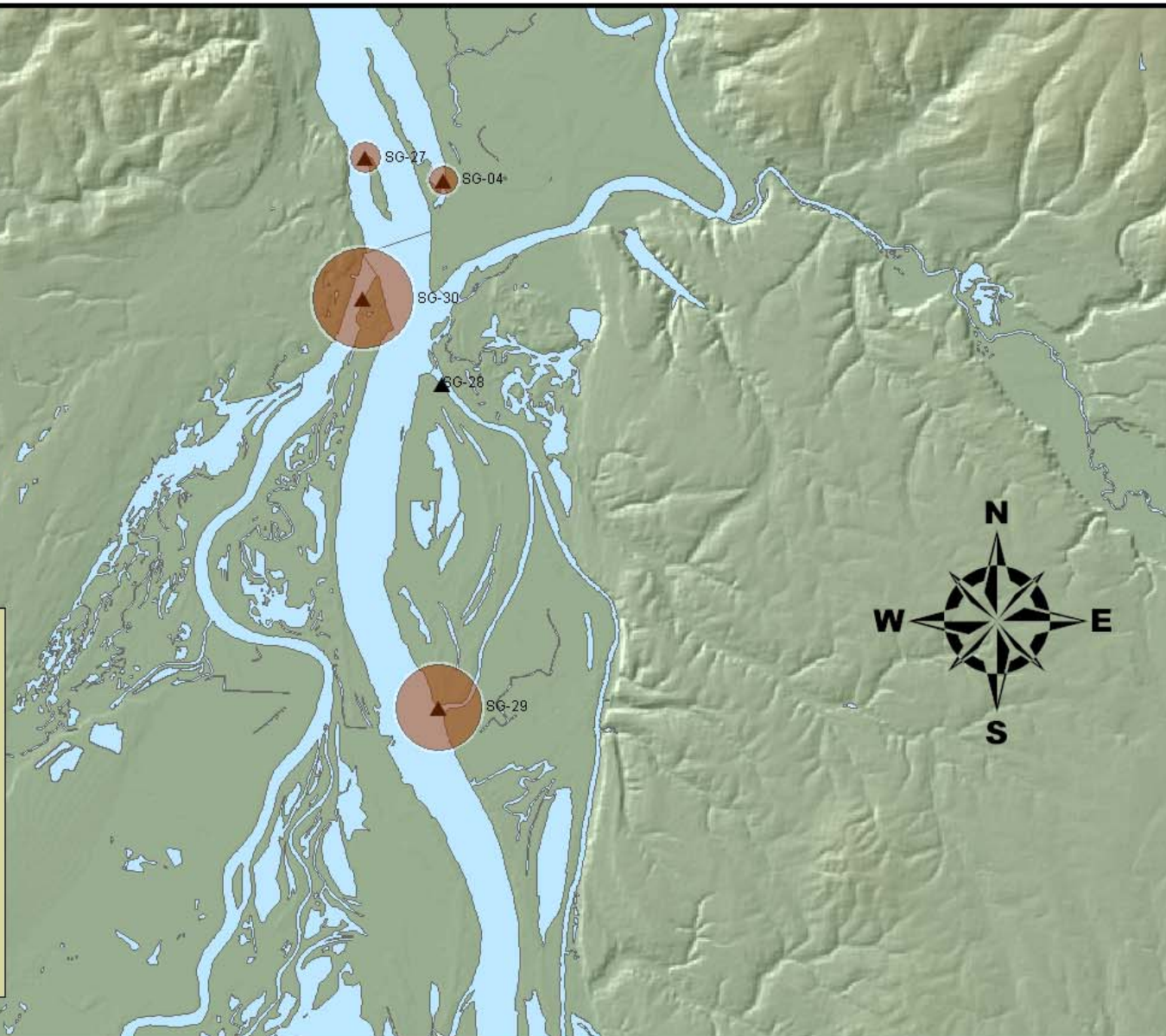
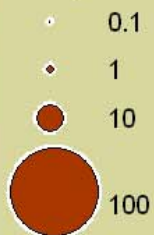




Legend

Corbicula sampling stations

Total_PBDE



CONCLUSIONS

- Able to Collect Clams Most Every Location Visited
- All Clams had Detectable Levels of Some Bioaccumulative Contaminant(s)
- Able to Pin-Point One Apparent Source of PCBs
- Able to Establish Relationships Between Stations
- Corbicula sp. is Proving to be a Good Laboratory and Field Collected Freshwater Species
- Need to Compare Results with Other Studies
 - WDOE 2005 SPMDs
 - LCREP Fish Study
 - LWG 2005 Willamette River Corbicula sp. Study