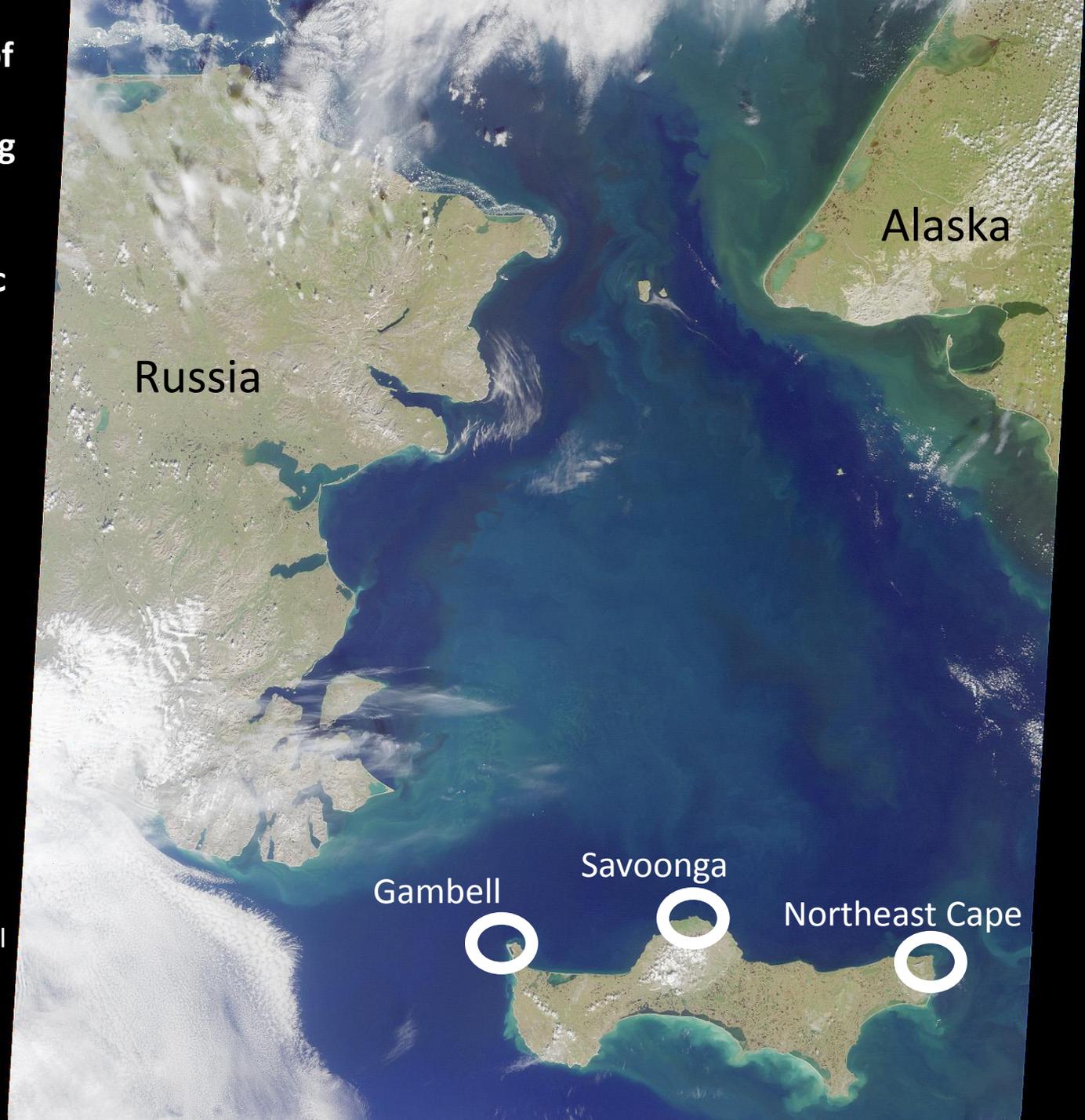


**“Protecting the Health of  
Future Generations:  
Assessing and Preventing  
Exposures to Endocrine-  
Disrupting Chemicals in  
Two Alaska Native Arctic  
Communities on  
St. Lawrence Island”**



Russia

Alaska

Gambell

Savoonga

Northeast Cape

National Institute of Environmental  
Health Sciences RO1, 2011-2016  
Miller, P.K., von Hippel, F.A., Buck,  
C.L. & Carpenter, D.  
NIEHS 1RO1ES019620

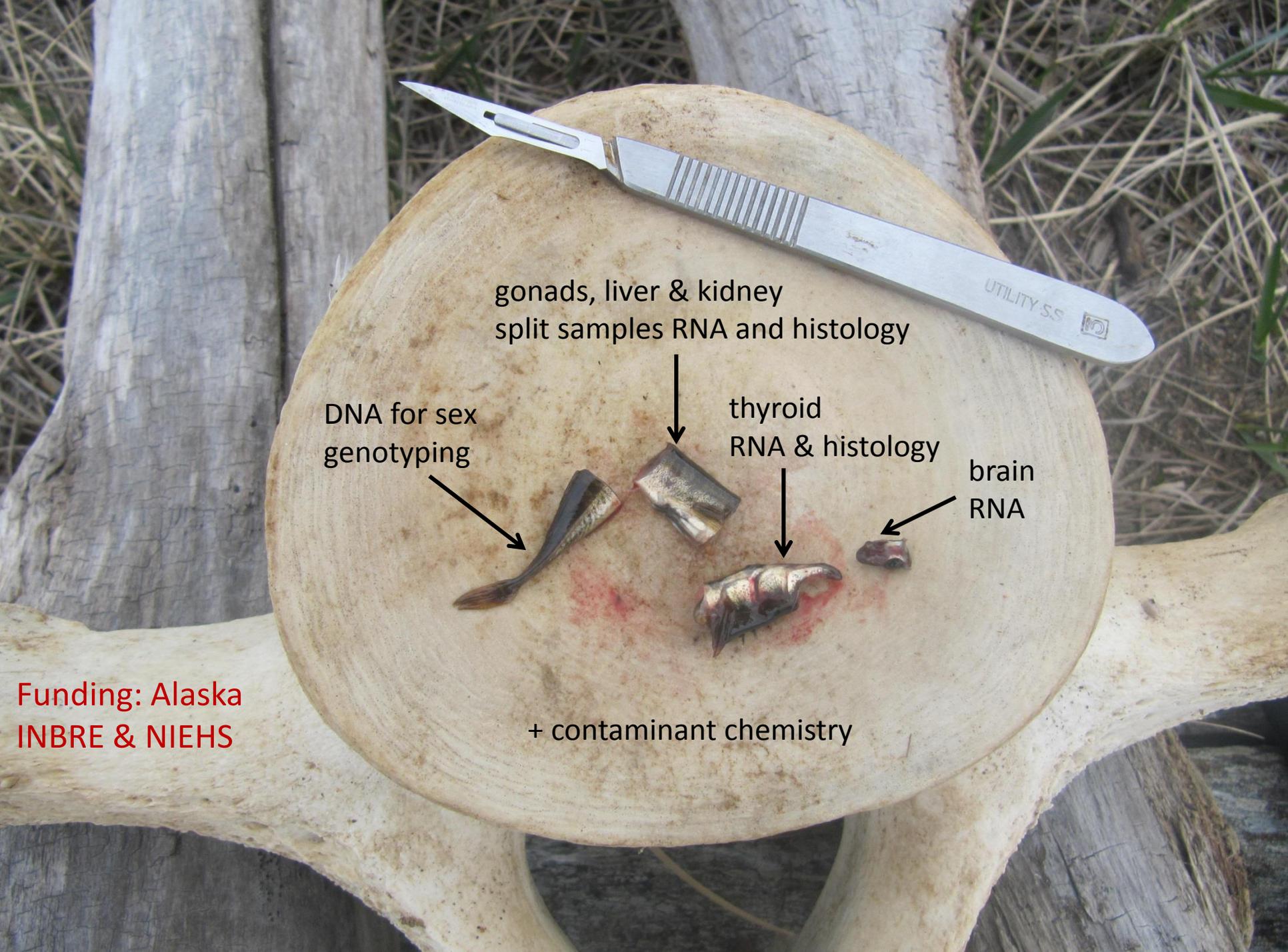
- 1) At the conclusion of site remediation, is remaining PCB contamination due primarily to the formerly used defense site or to atmospheric deposition?
- 2) Is the remaining PCB contamination biologically relevant for resident freshwater fishes?
- 3) Do contaminant levels have implications for the health of people on St. Lawrence Island?





T 1	T 2	T 3	T 4	T 5	T 6	T 7	T 8	T 9	T 10	T 11	T 12	T 13	T 14	T 15	T 16	T 17	T 18	T 19	T 20	T 21	T 22	T 23	T 24	T 25	T 26	T 27	T 28	T 29	T 30	T 31	T 32	T 33	T 34	T 35	T 36	T 37	T 38	T 39	T 40	T 41	T 42	T 43	T 44	T 45	T 46	T 47	T 48	T 49	T 50	T 51	T 52	T 53	T 54	T 55	T 56	T 57	T 58	T 59	T 60	T 61	T 62	T 63	T 64	T 65	T 66	T 67	T 68	T 69	T 70	T 71	T 72	T 73	T 74	T 75	T 76	T 77	T 78	T 79	T 80	T 81	T 82	T 83	T 84	T 85	T 86	T 87	T 88	T 89	T 90	T 91	T 92	T 93	T 94	T 95	T 96	T 97	T 98	T 99	T 100
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gonads, liver & kidney  
split samples RNA and histology

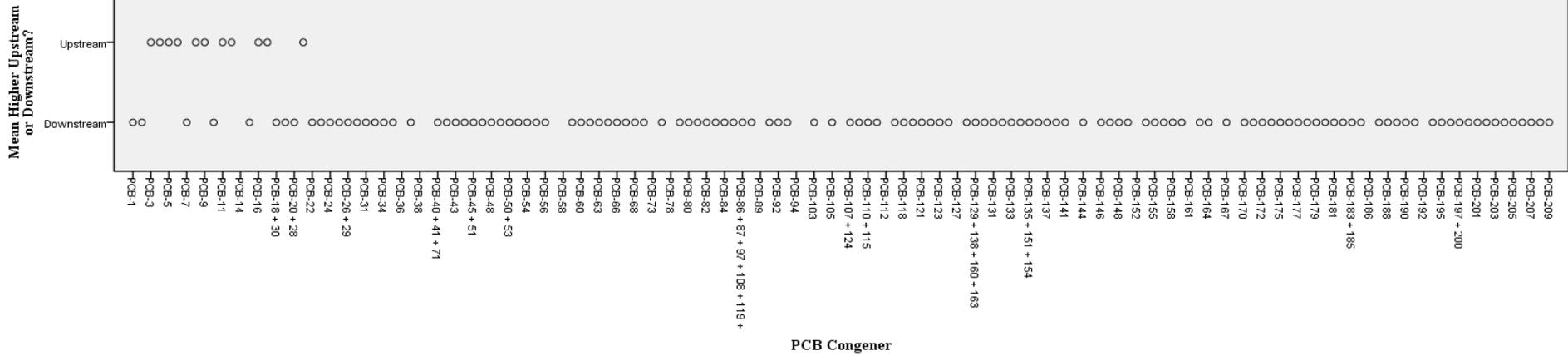
DNA for sex  
genotyping

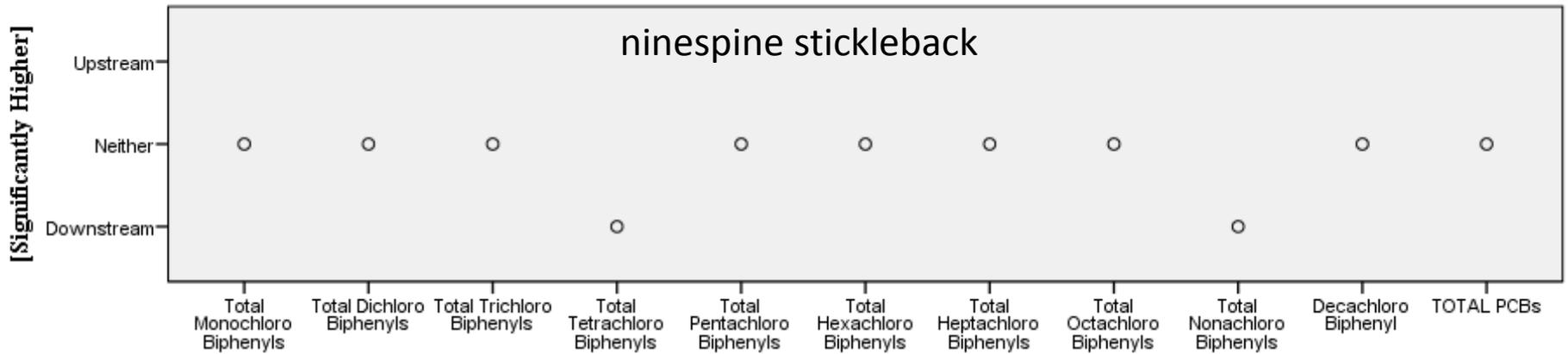
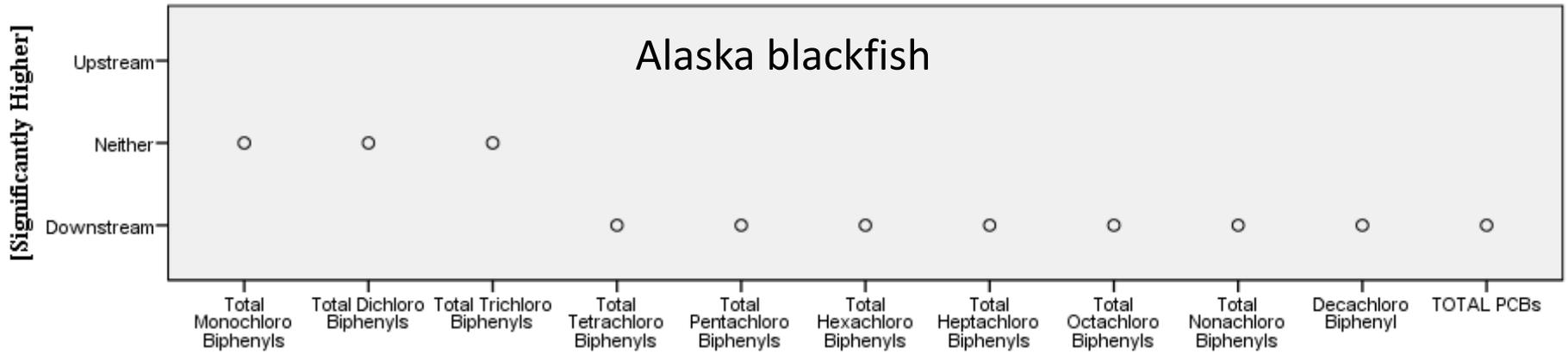
thyroid  
RNA & histology

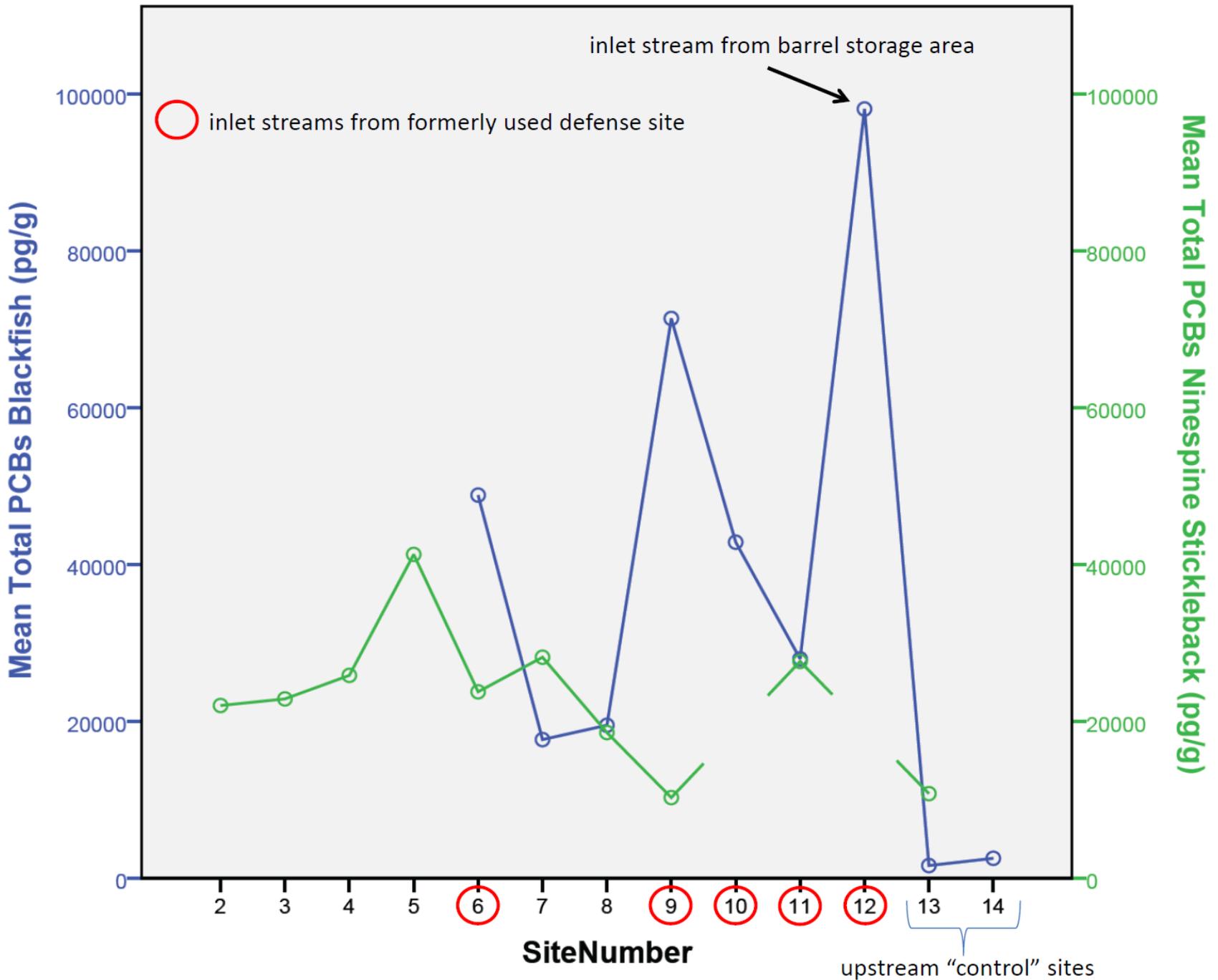
brain  
RNA

+ contaminant chemistry

Funding: Alaska  
INBRE & NIEHS



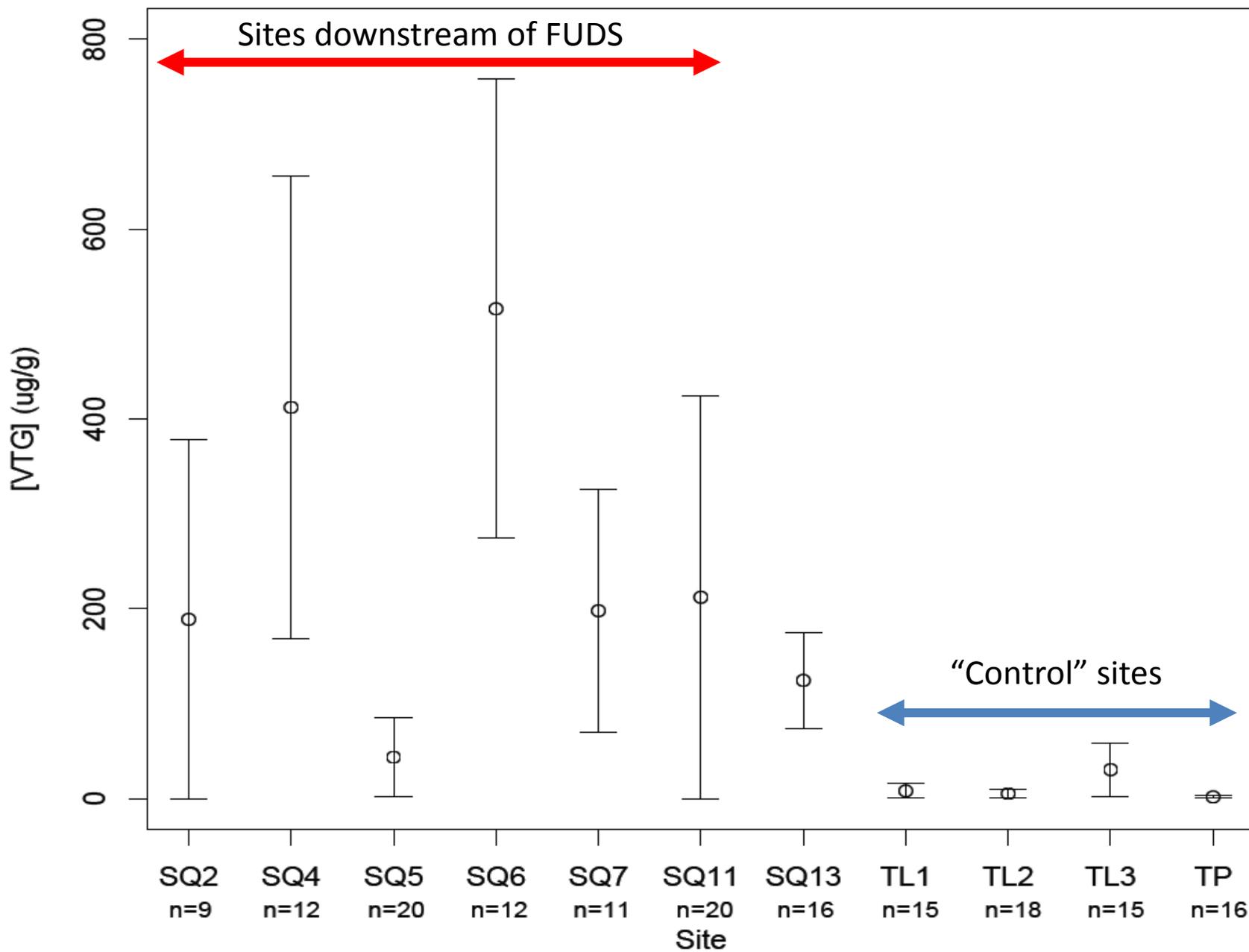


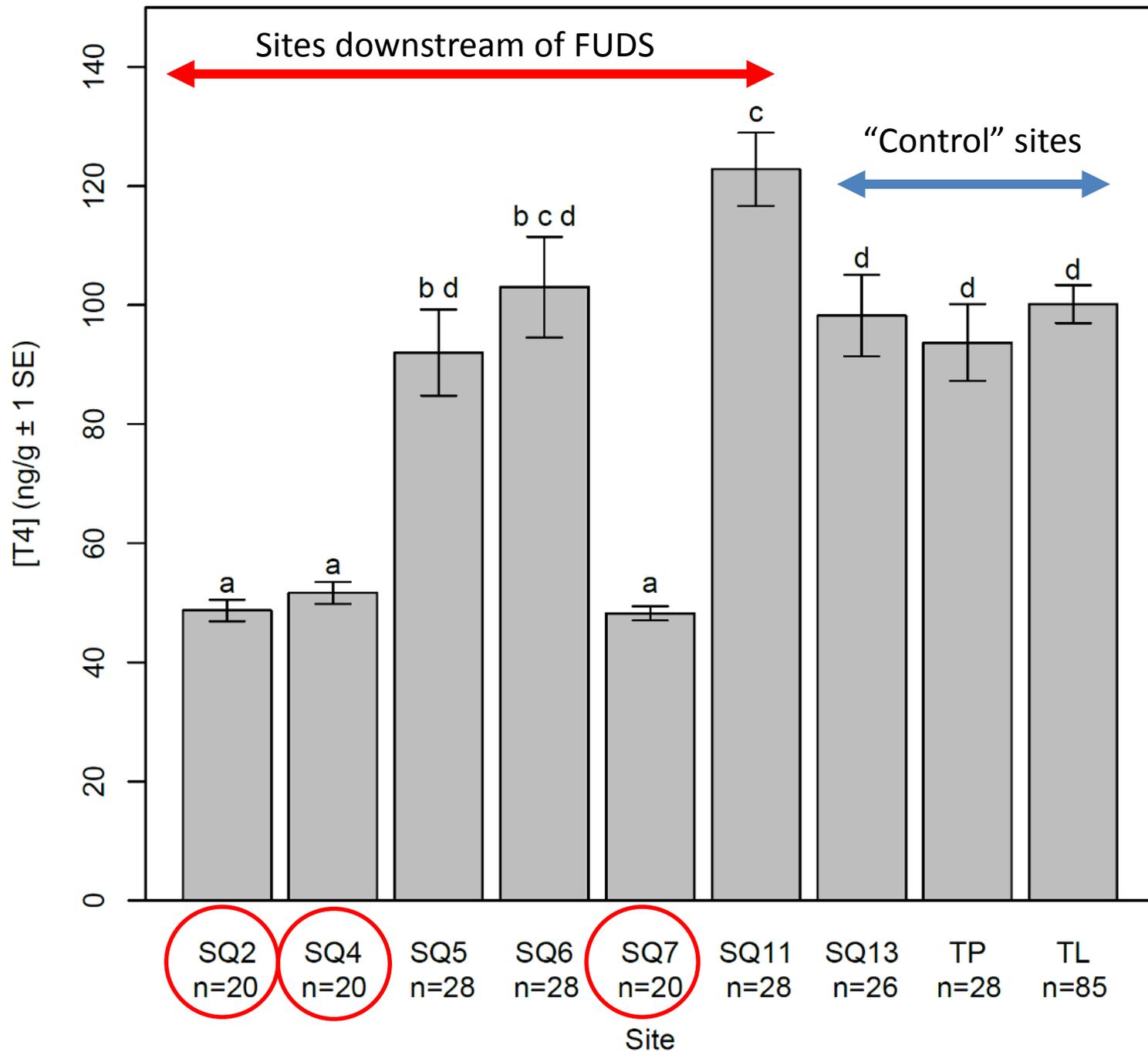


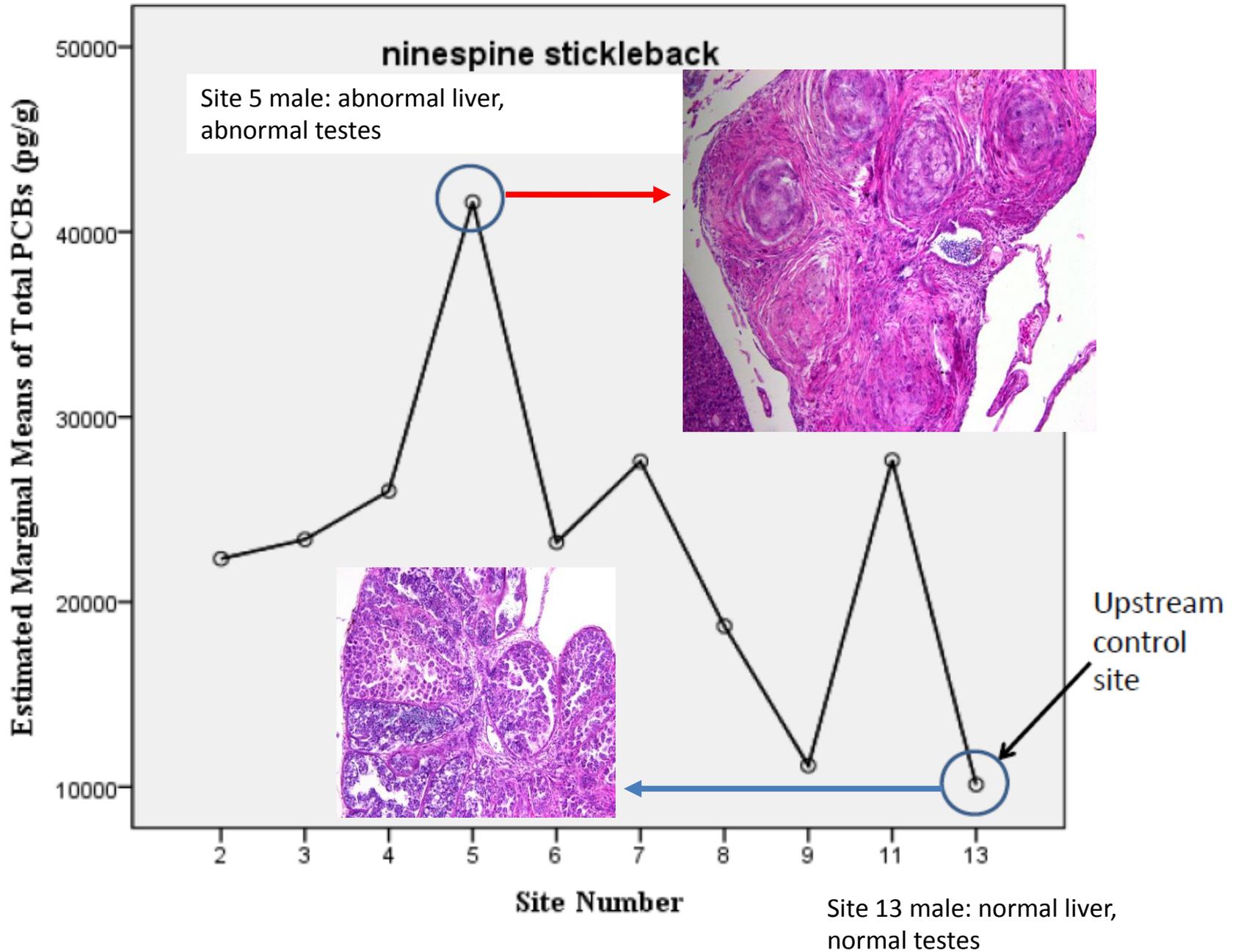
Levels of PCBs in the Suqi River fish are still high,  
even though clean-up is considered complete...  
and contaminant chemistry reveals a mostly local source (FUDS),  
but are these PCB concentrations biologically meaningful?

Is the hormone system of the fish disrupted?









Is gene expression of the fish disrupted?





Expression of genes associated with DNA repair and replication, proteases, metal ion binding, symporters...

1) At the conclusion of site remediation, is remaining PCB contamination due primarily to the formerly used defense site or to atmospheric deposition?

Most PCB contamination in the Suqi River originated at the FUDS.

2) Is the remaining PCB contamination biologically relevant for resident freshwater fishes?

Sentinel fish in the Suqi River show estrogenic effects, thyroid disruption, and altered gene expression.

3) Do contaminant levels have implications for the health of people on St. Lawrence Island?

Fish and humans share the same hormone systems and most of the genes underlying diseases in humans are the same genes underlying those diseases in fish. Estrogenic effects are associated with abnormal development and certain cancers. Altered gene expression results are also consistent with higher cancer risk. The fish results, therefore, indicate that PCB levels in the Suqi River are still high enough to cause health problems in people exposed to those PCBs, through, for example, eating Suqi River fish.