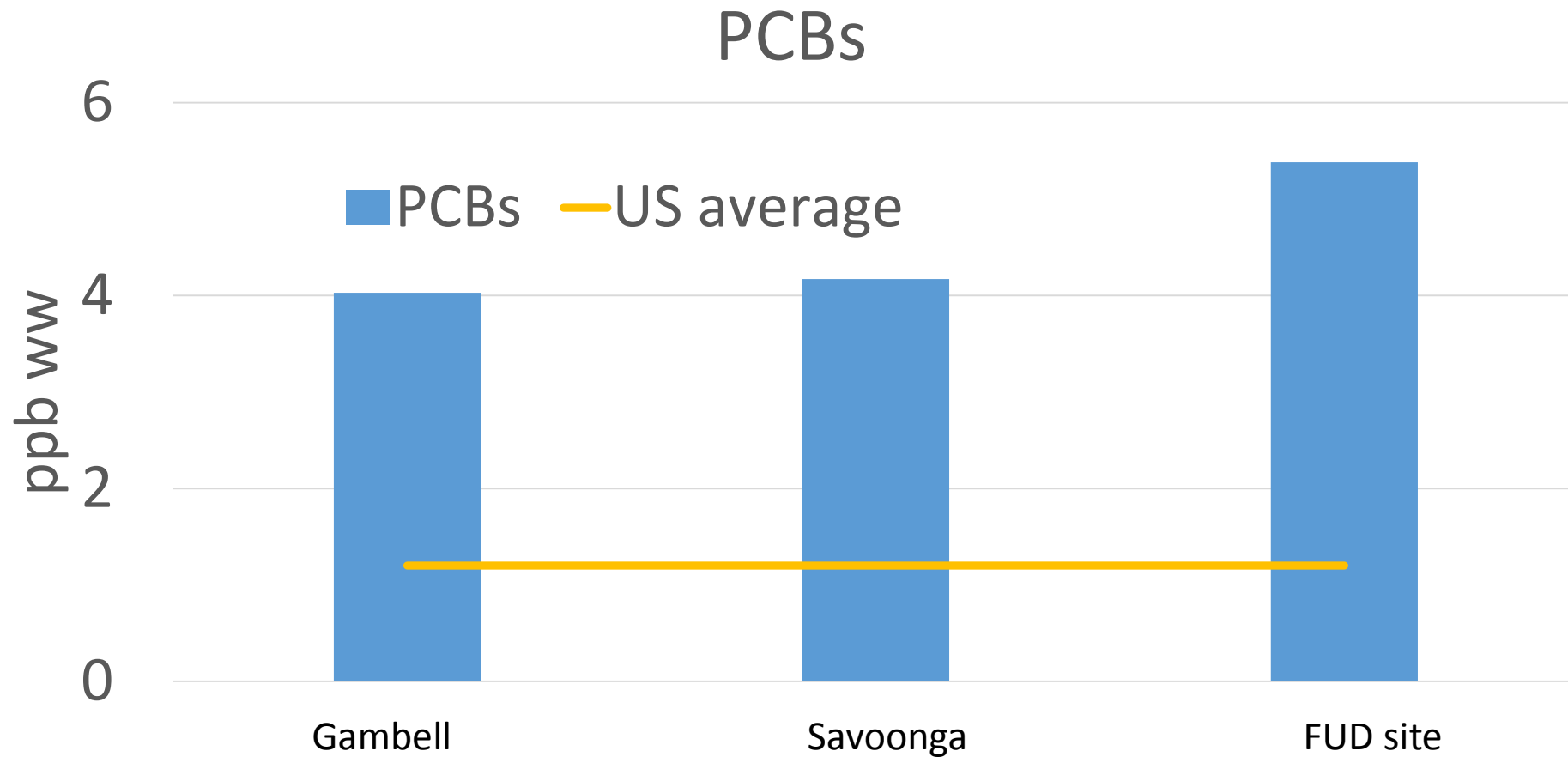




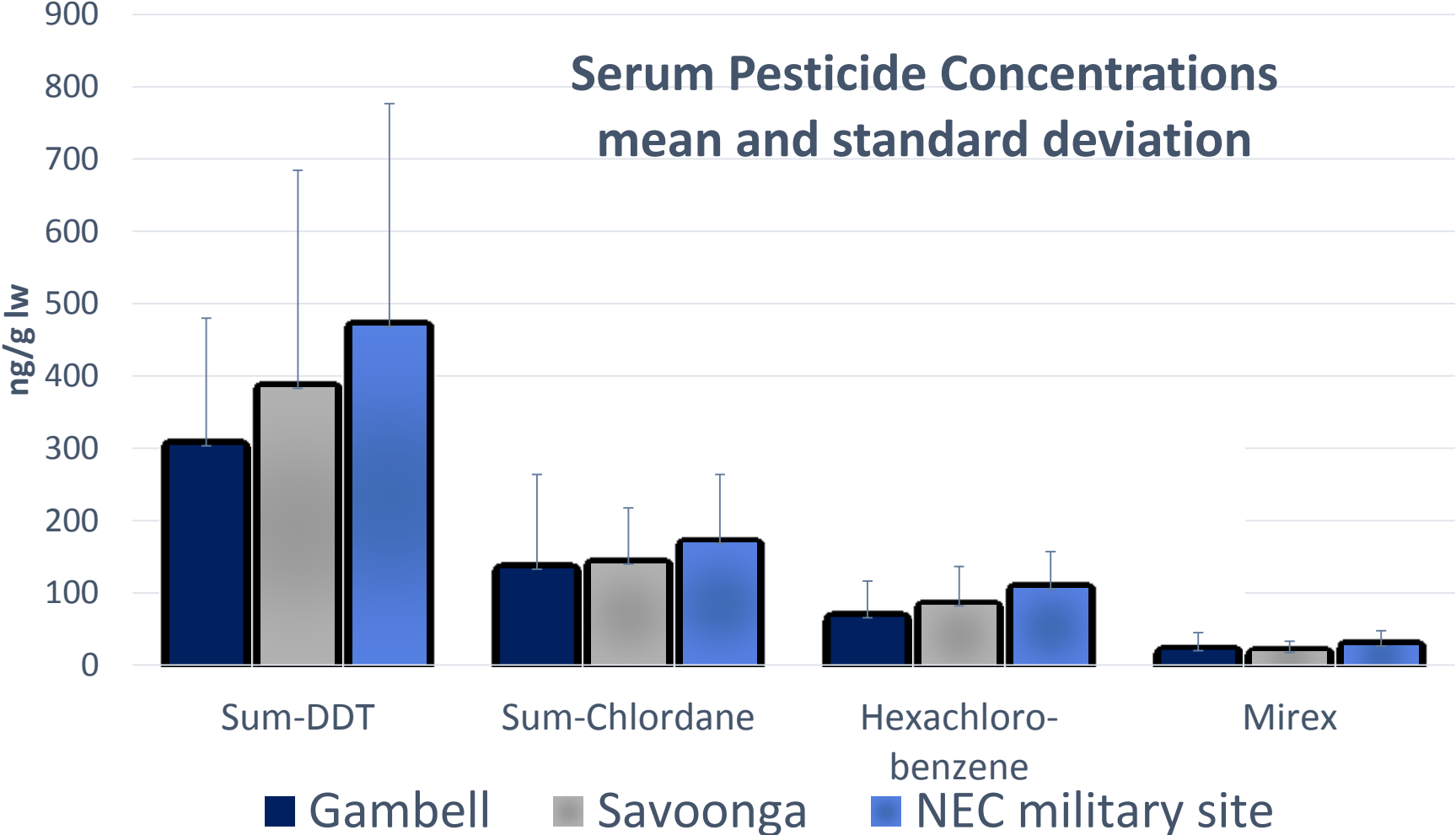
SOURCES OF PFAAS AND PBDE EXPOSURE ON ST. LAWRENCE ISLAND

AK CHE 11/1015

PCB contamination



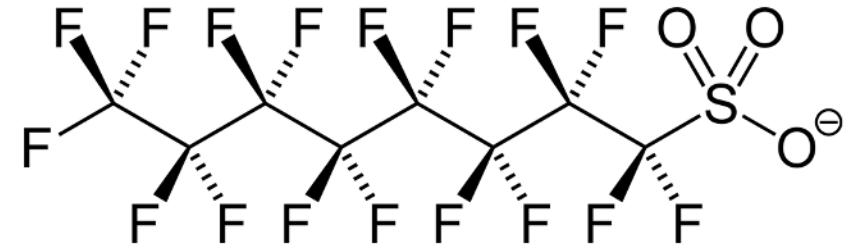
Pesticide contamination



Other Sources of Exposure?

- Global transport and distillation
 - Accumulation of persistent organic pollutants in the Arctic
- Traditional diets
 - Consumption of long lived and high trophic level animals
- Long heating season
 - Low air exchange and potential for accumulation of indoor pollution

PFAAs



Characteristics

- Utilized for a variety commercial and industrial applications
 - Surfactants, stain and water proofing, cookware, food packaging, firefighting foams
- Persistent and bioaccumulative

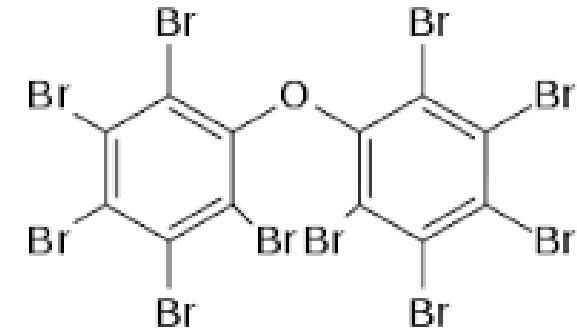
Health Effects

- Evidence for immunotoxicity
- Reduced Fertility
- Thyroid hormone disruption

Sources

- Diet, and indoor dust and air

PBDES



Characteristics

- Flame retardants added to numerous consumer products: furniture, electronic, fabric
- Persistent, bioaccumulative

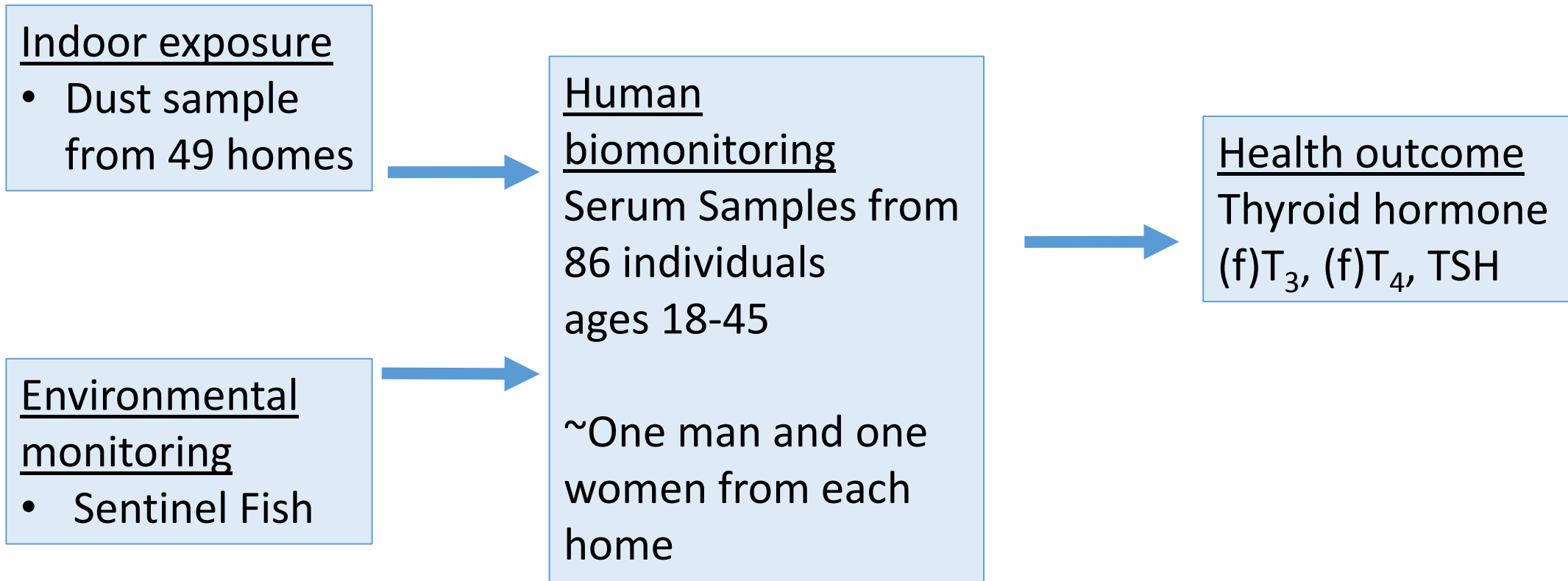
Health effects

- Cognitive/behavioral effects in children
- Anti-androgenic effects and reduced fertility
- Thyroid hormone disruption

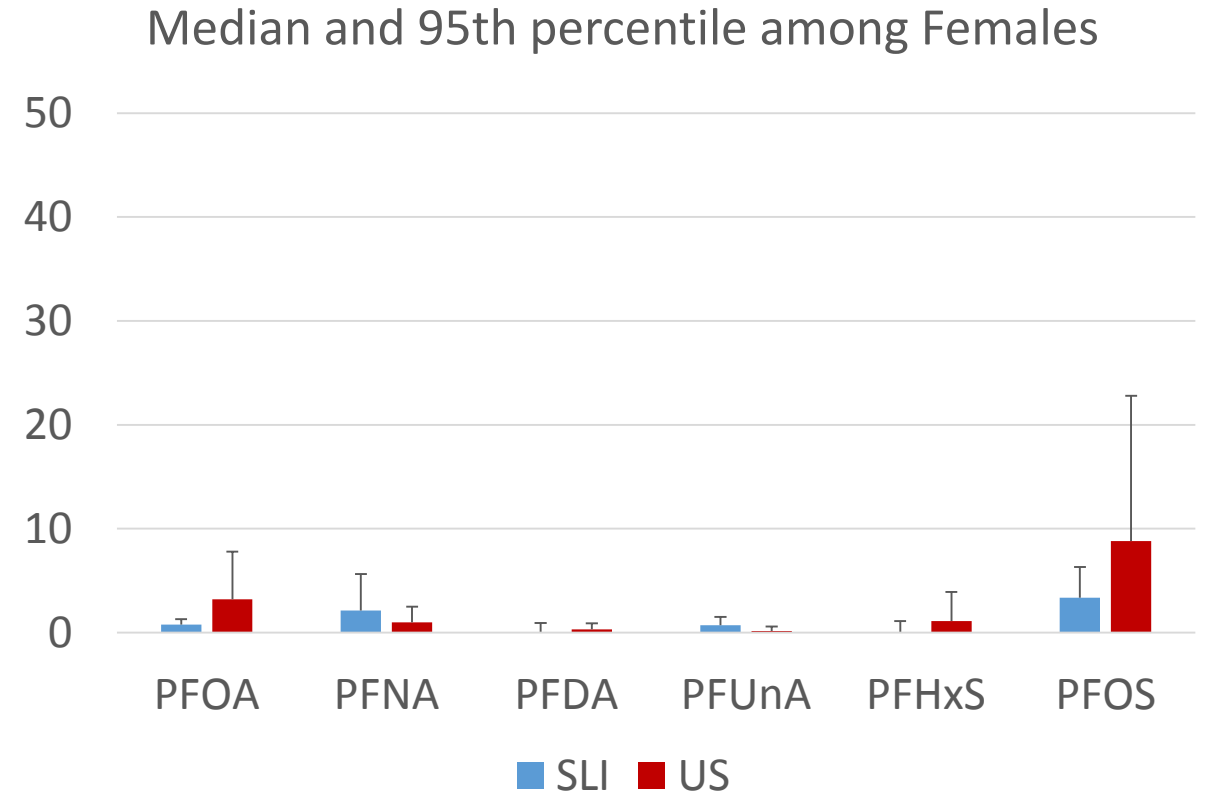
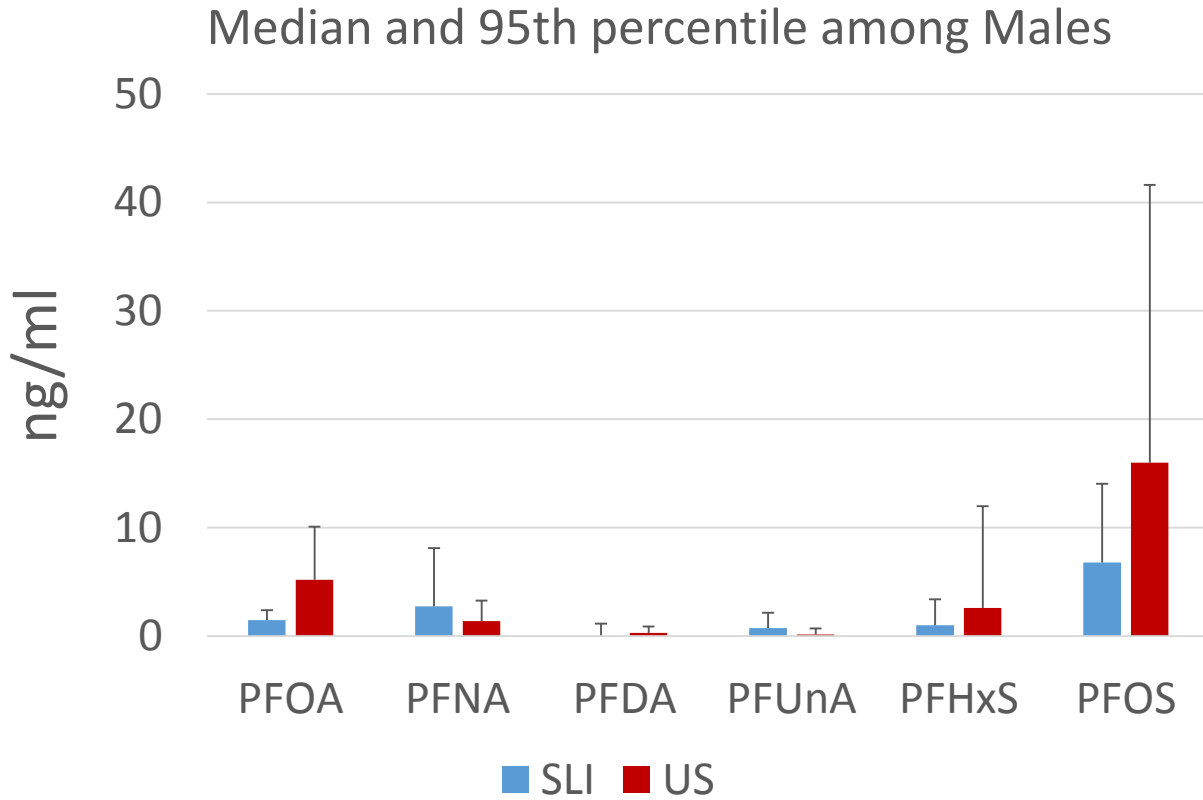
Sources

- House dust and animal products in diet

Overall Study Design



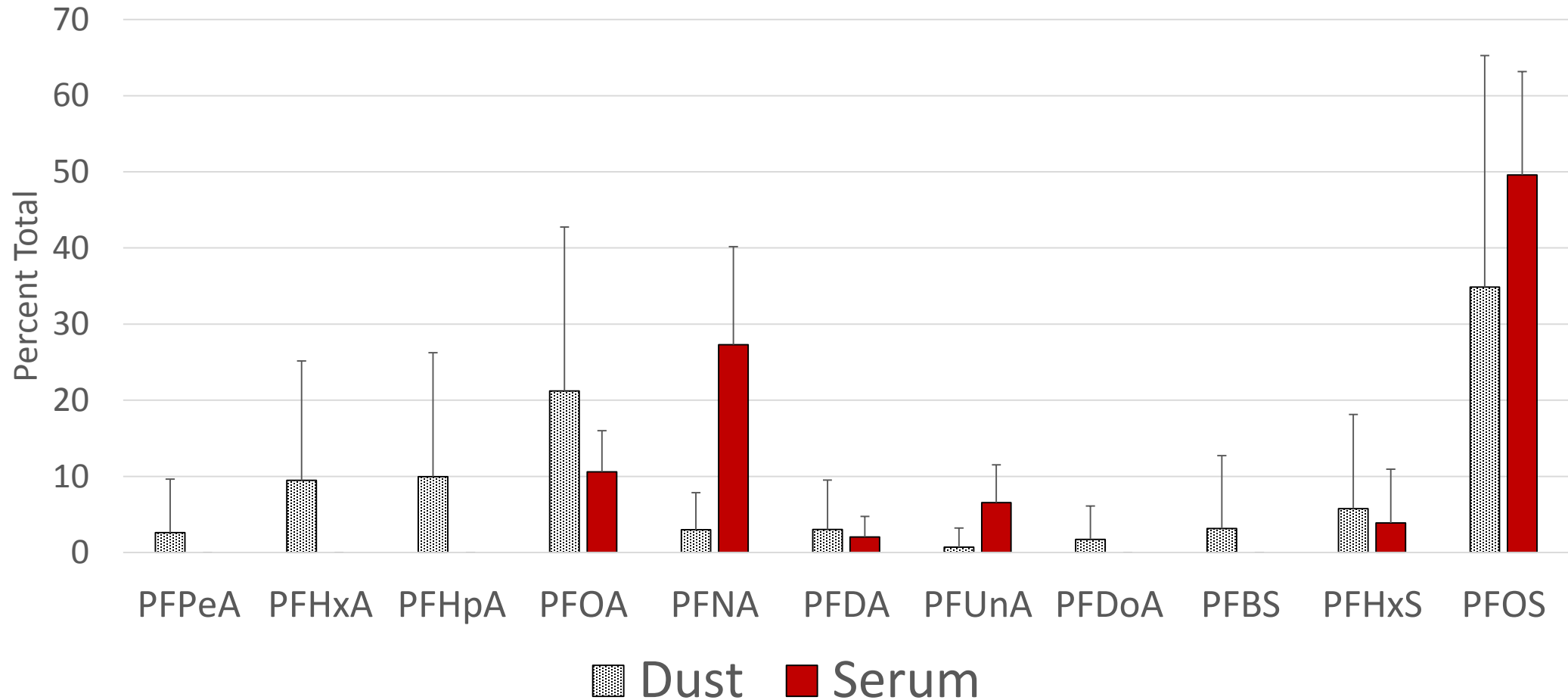
RESULTS

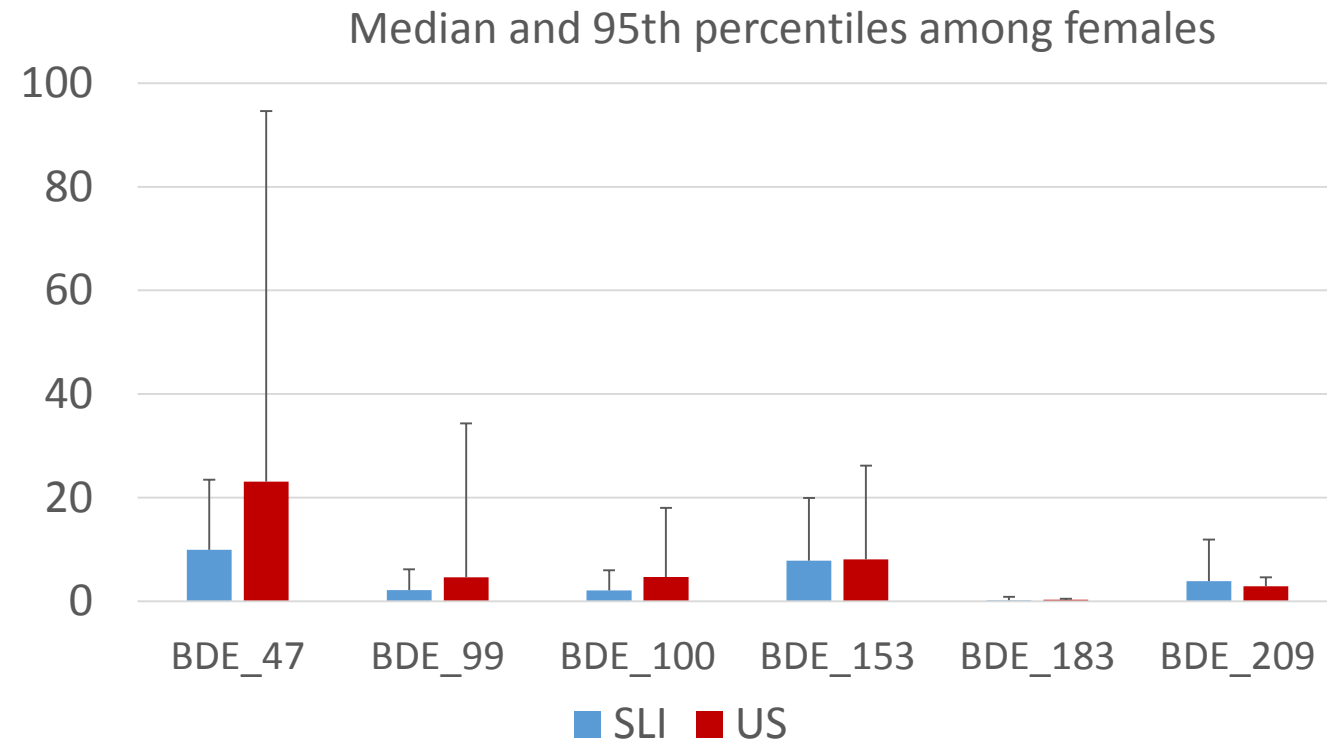
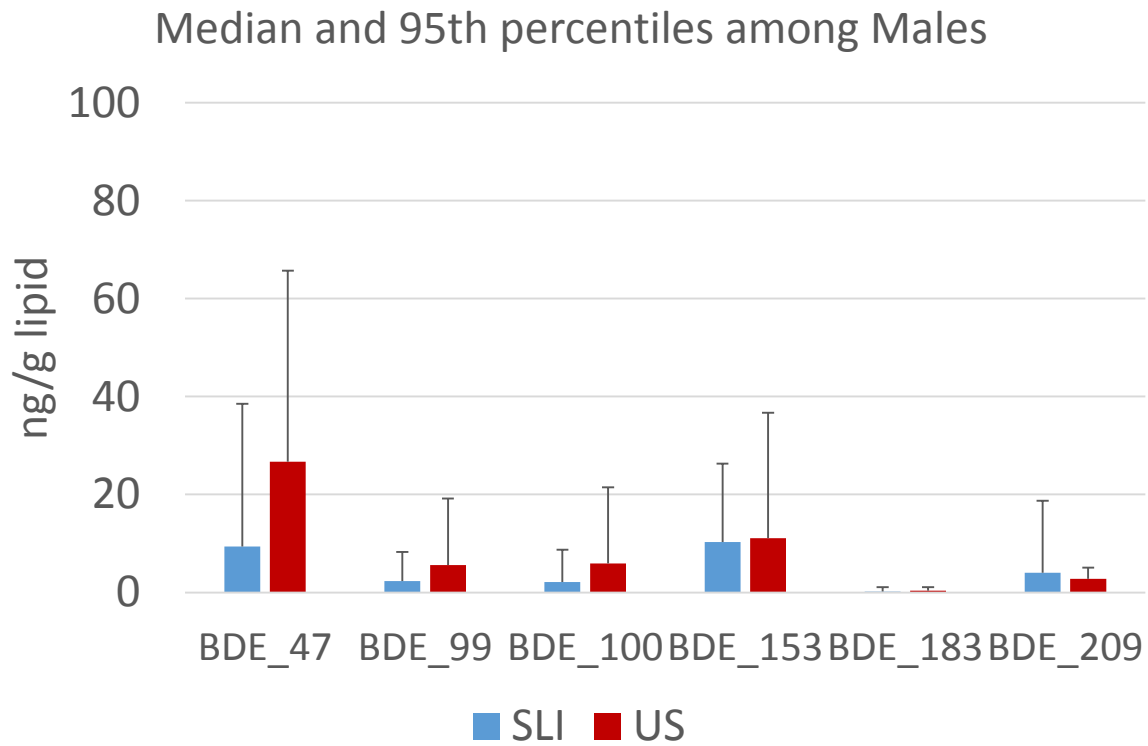


SLI= St. Lawrence Island

US= United States general population ages 18-45, 07-08 NHANES

Relative concentrations In Dust and Serum

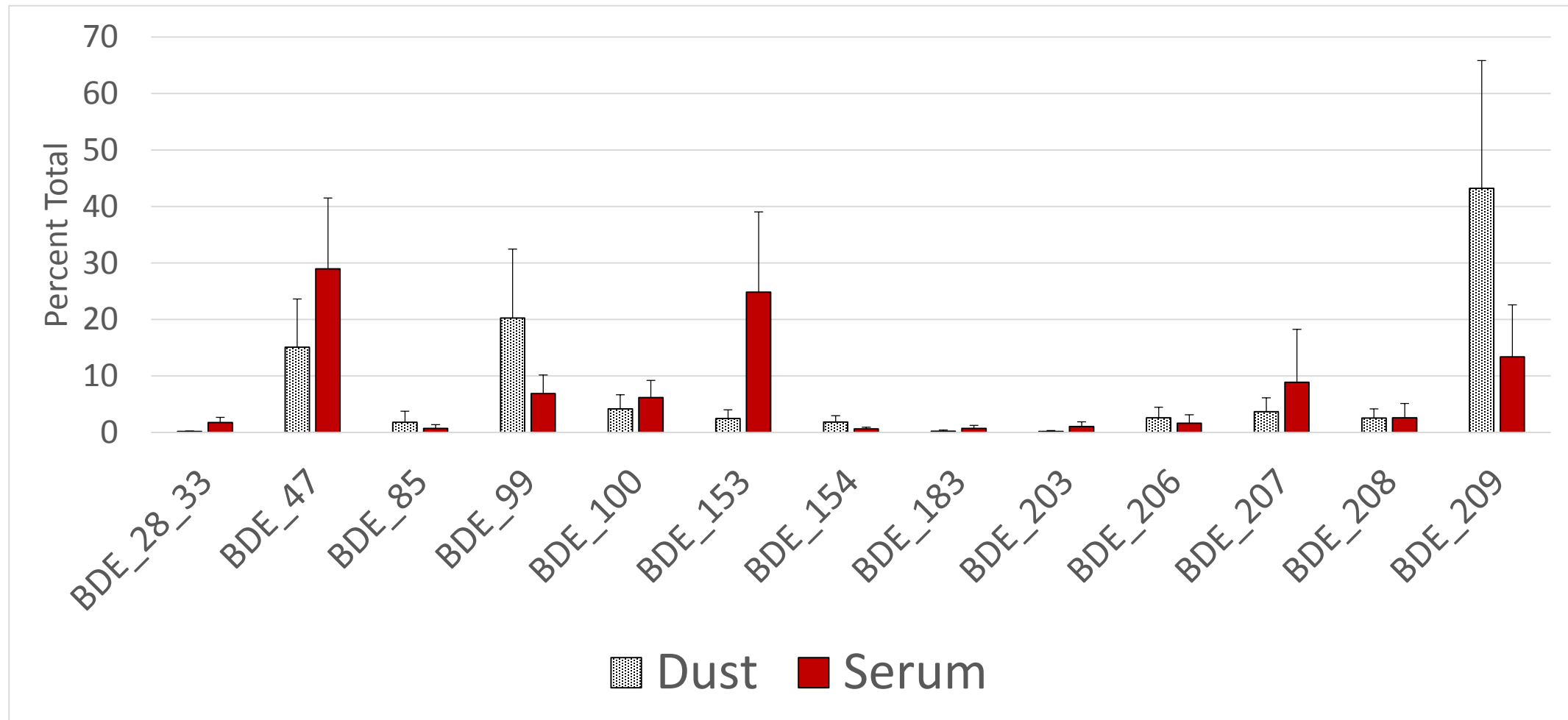




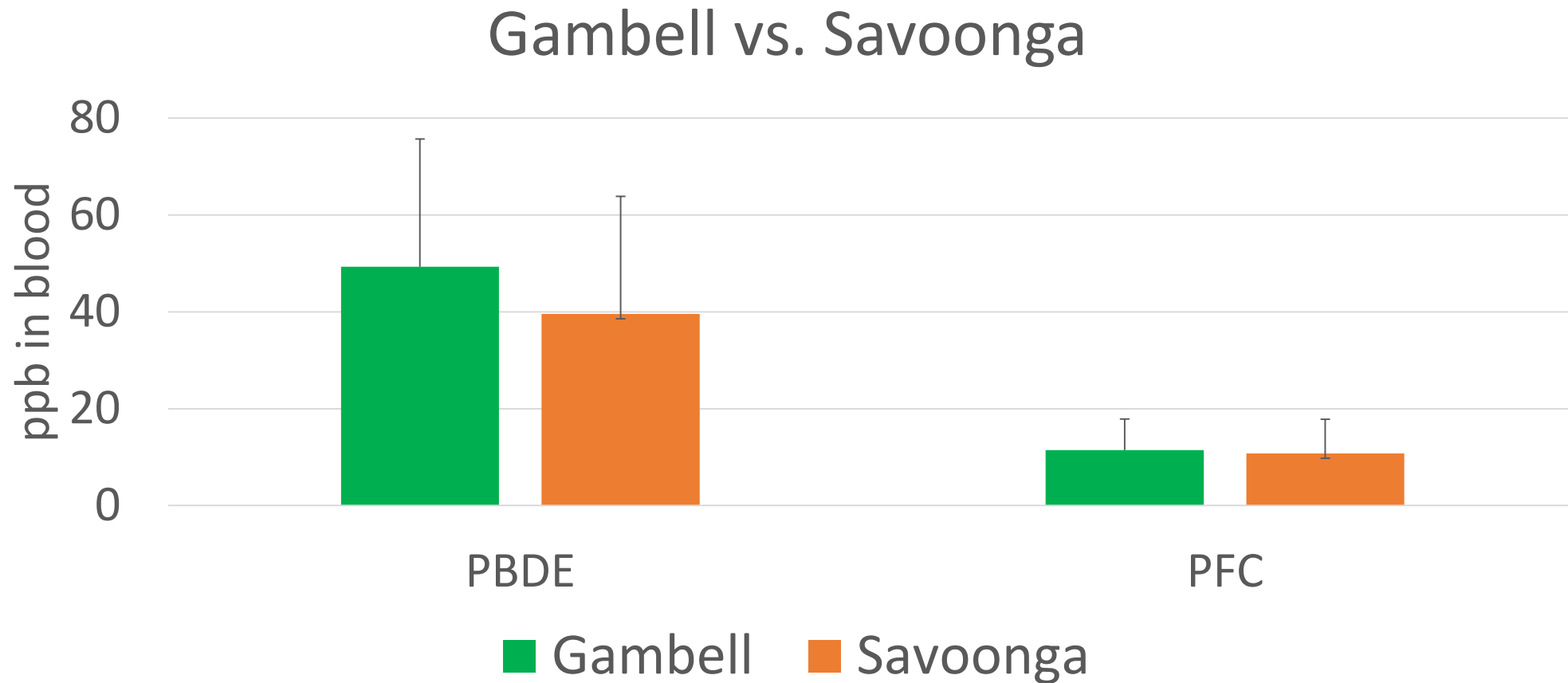
SLI= St. Lawrence Island

US= United States general population ages 20-39, 07-08 NHANES

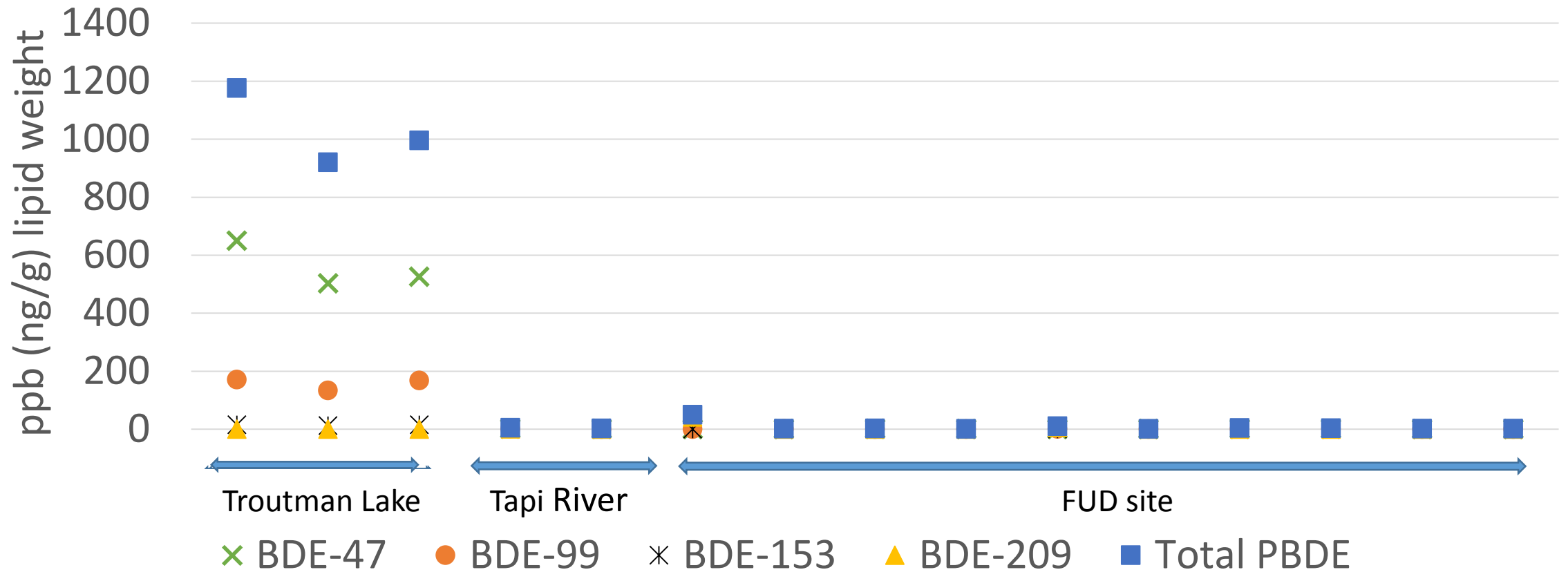
Relative concentrations in Dust and Serum



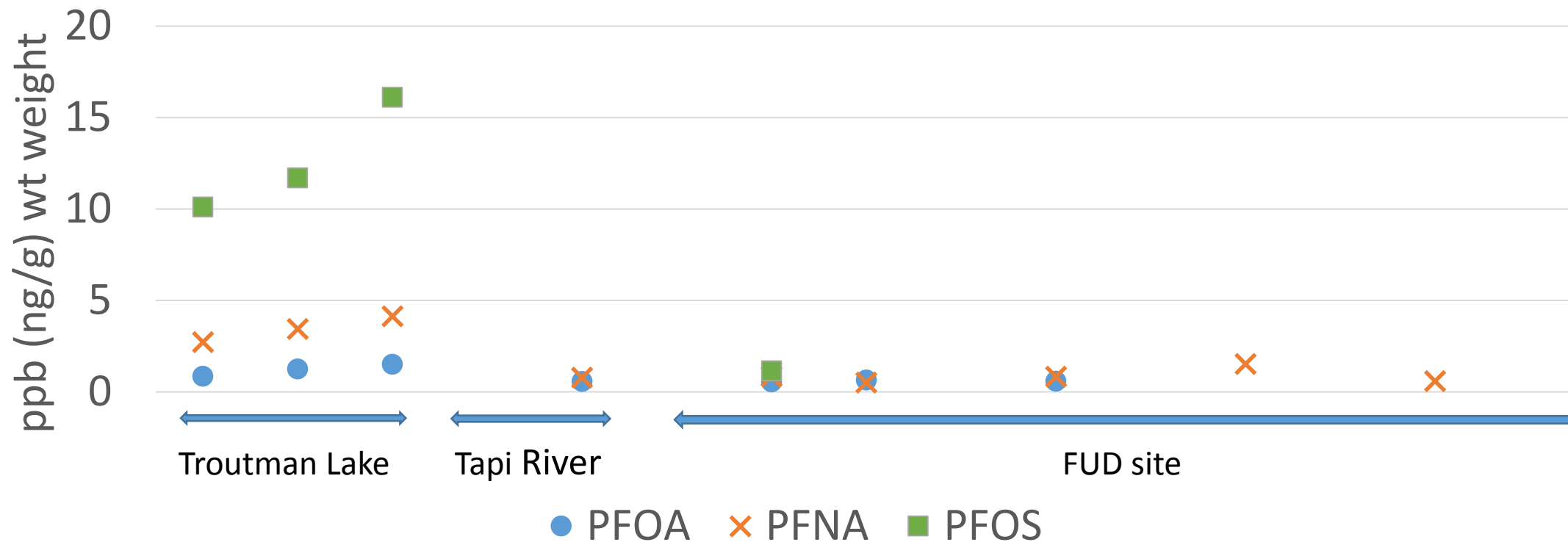
Comparison by village



PBDEs in Stickleback



PFAAs in Stickleback



What have we learned so far?

- ❖ Where is PBDE exposure coming from?
 - ❖ We think that dust is an important source of PBDEs
 - ❖ PBDEs are present in fish on the island, and diet is probably a source of PBDEs
- ❖ Where are PFAAs coming from?
 - ❖ We think dust a minor source of PFAAs
 - ❖ A few PFAAs are higher on SLI than in the general US population
 - ❖ Diet is probably an important source of PFAAs, especially PFNA and PFUNA
- ❖ Stickleback data suggest both PBDEs and PFAAs are accumulating on the Island
 - ❖ In general, the same PBDEs and PFAAs are present in humans and stickleback