

POPs distribution in coastal permafrost soils at Komakuk Beach (Yukon, CA)

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**KOMAKUK
BEACH**

POPS



POLYGONAL TUNDRA

**Catchment scale
analyses and
mapping of soils**

Komakuk Beach 2019
● Sampling location



**89
samples**



**HCB
PCBs
PAHs**

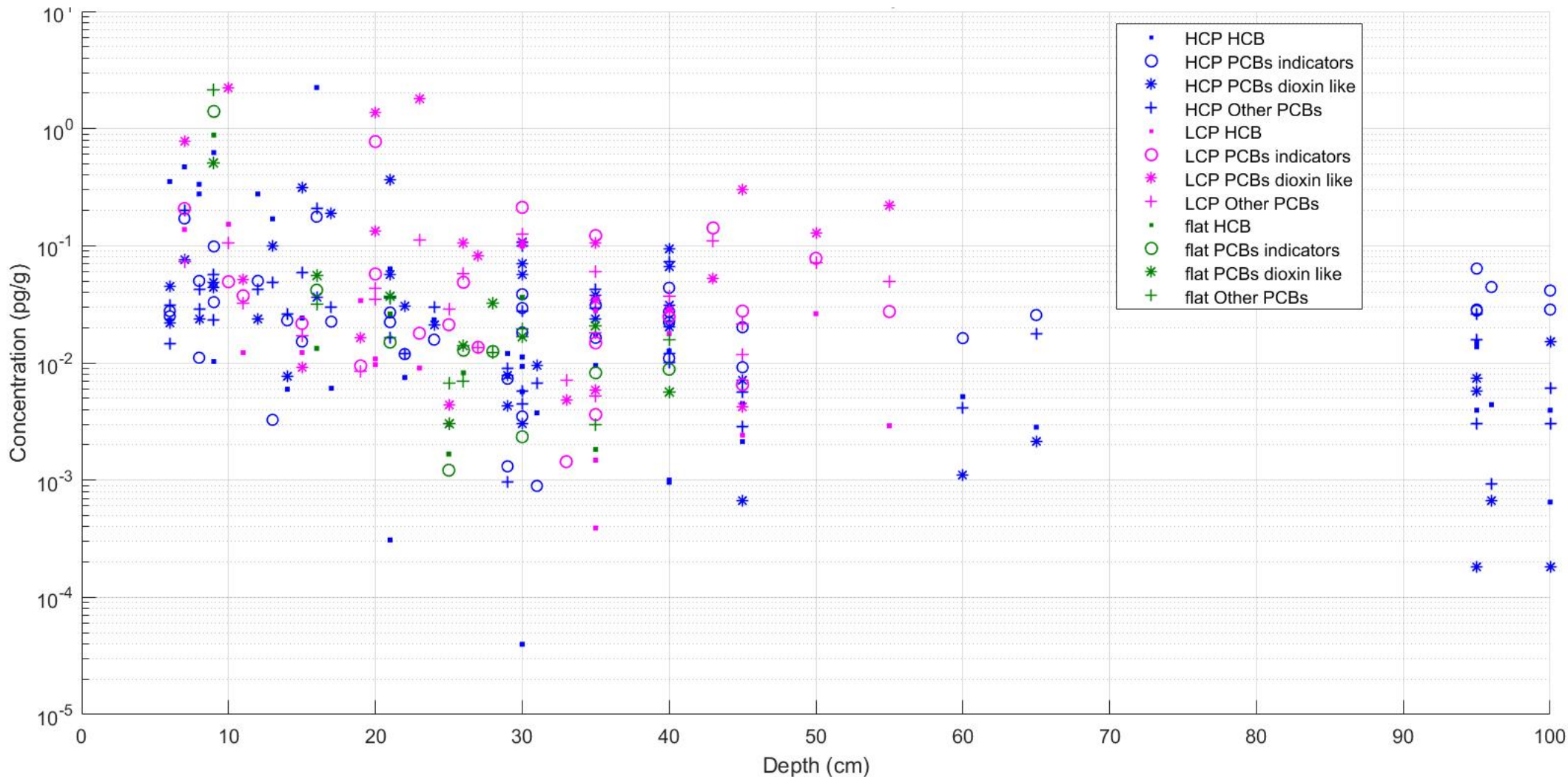


0 1 2 km

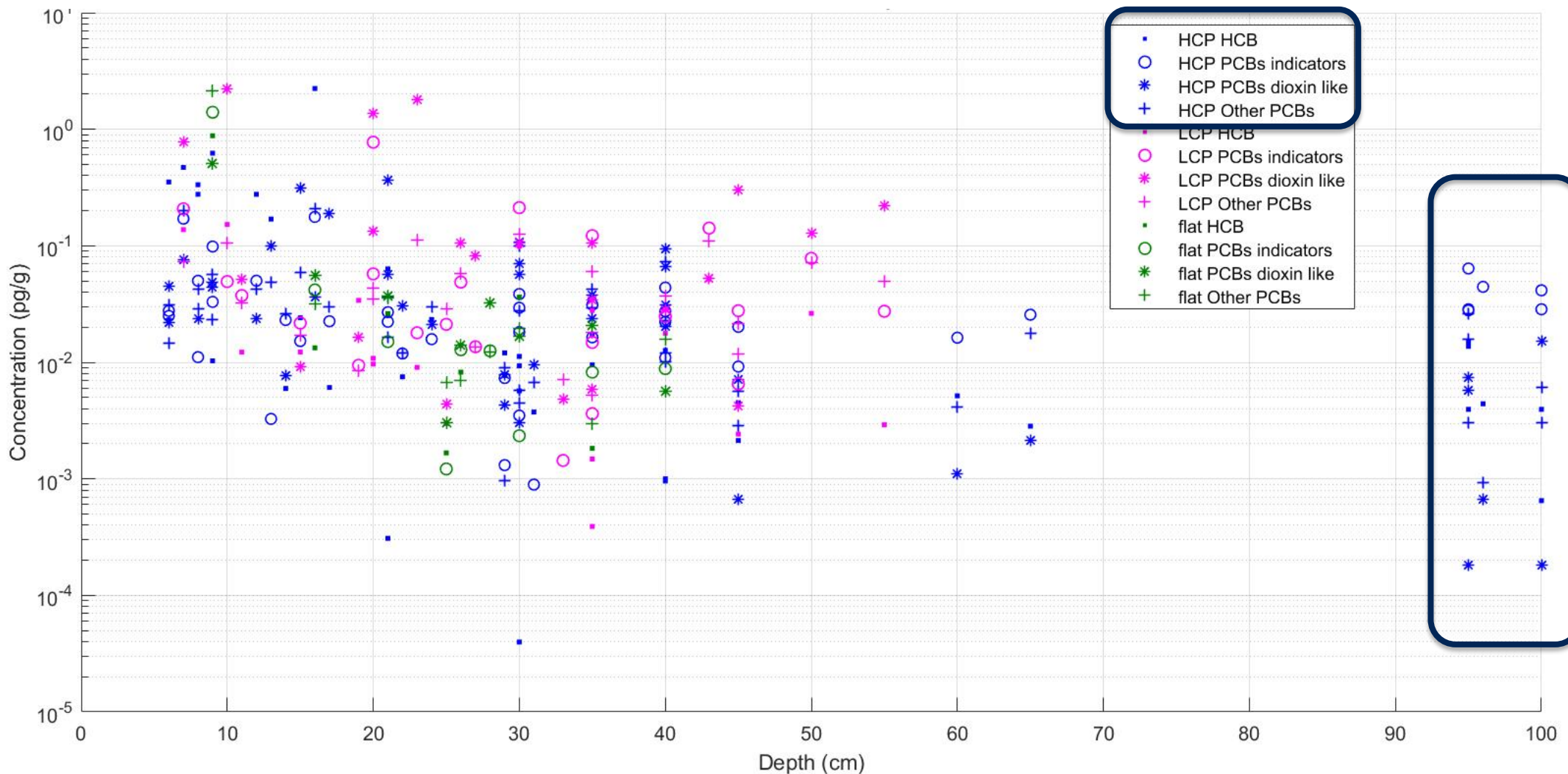
The concentrations have been determined by using

Thermo Scientific Dionex ASE 350
and Trace 1310 GC coupled with TSQ9000 TQMS, Thermo Scientific
at CNR-ISP Venice, Italy

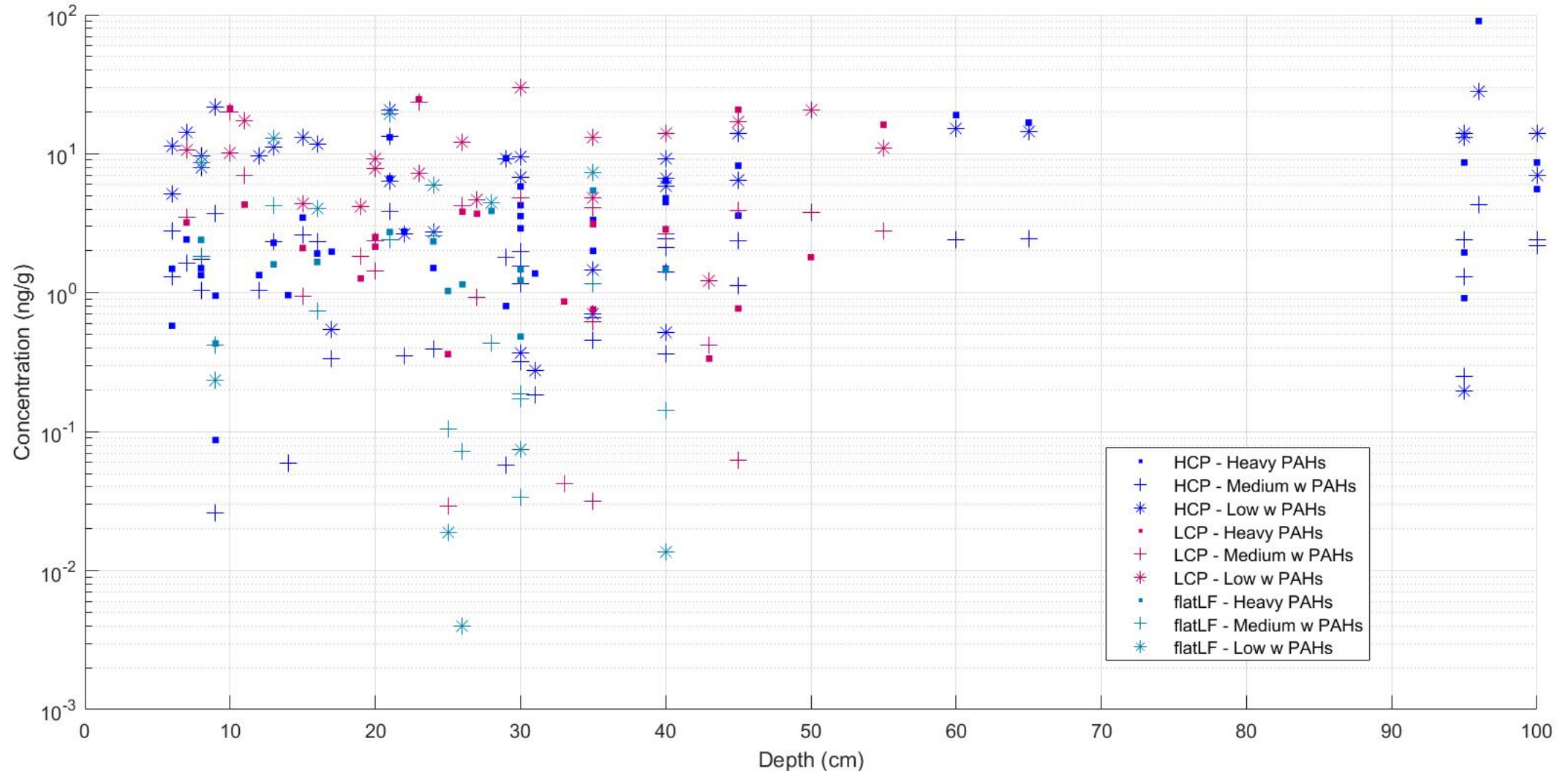
HCB and $\Sigma 54$ PCBs distribution by molecular weight – note the HCP samples concentration



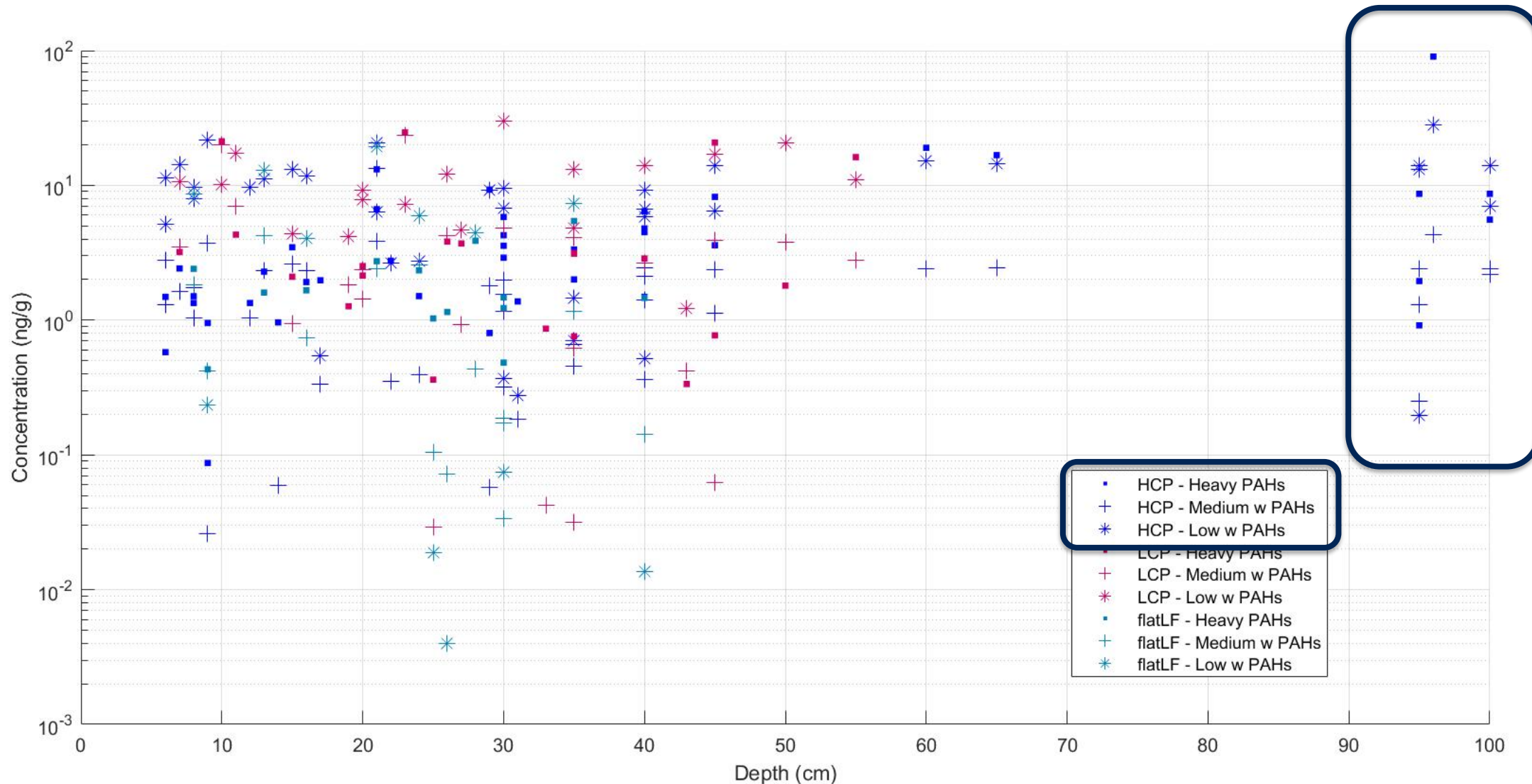
HCB and $\Sigma 54$ PCBs distribution by molecular weight – note the HCP samples concentration



PAHs distribution by molecular weight – note the HCP samples concentration



PAHs distribution by molecular weight – note the HCP samples concentration



Their hydrophobic nature means that PCBs are usually associated with the organic carbon fractions of soils and sediments.

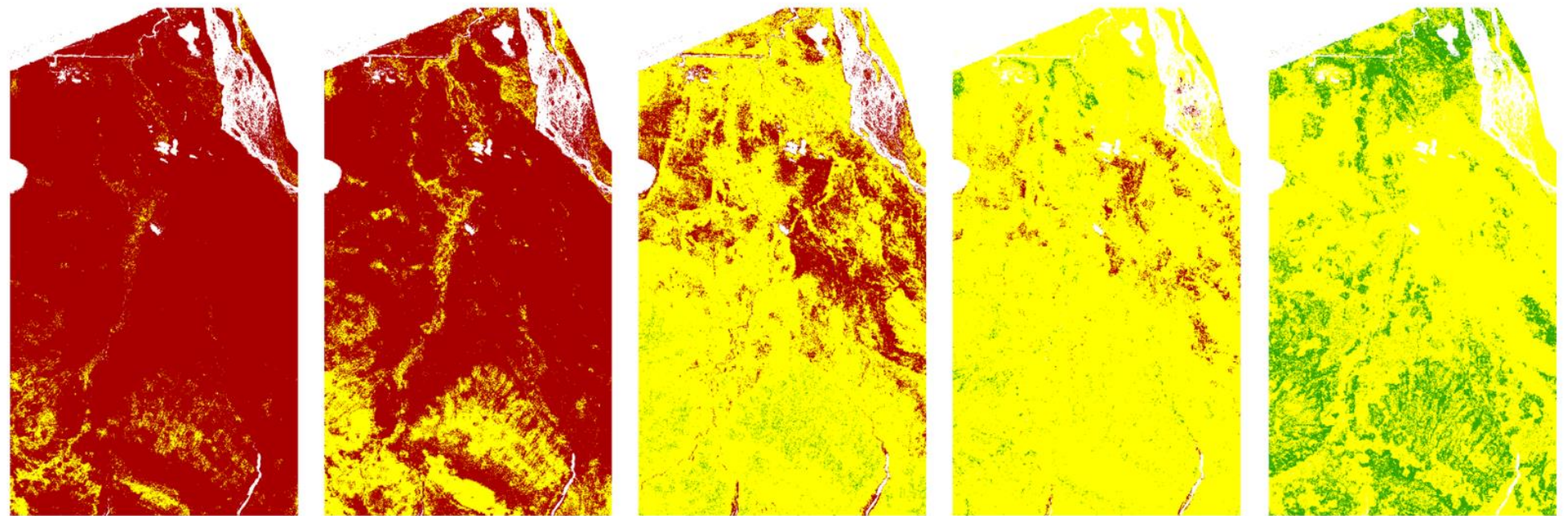
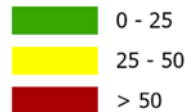
The correlation index for the model developed for Tetra and Penta chlorinated PCBs and the C% is $R = 0.95$ and 0.94 respectively.

Significant but different correlations are shown between light and heavy PAHs and Carbon content.

A first attempt of upscaling feasible for small coastal catchments in polygonal tundra environment. Model equations applied to C% prediction maps (Wagner et al.).

Distribution of light PAHs (ng/g) at Komakuk Beach

Light PAHs (ng/g)



0-5 cm

5-15 cm

15-30 cm

30-60 cm

60-100 cm

depth from soil surface

0 1000 Meters

Micro-topographical controls on seasonal freeze-thaw dynamics and hydrology play a role in POPs distribution in permafrost soils.

Model and distribution maps should be viewed as preliminary, but we are working on a **multi-input model** that allows a more accurate estimation of Organic Contaminants distribution.

THANK YOU

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AGU FALL
MEETING

SCIENCE LEADS THE FUTURE