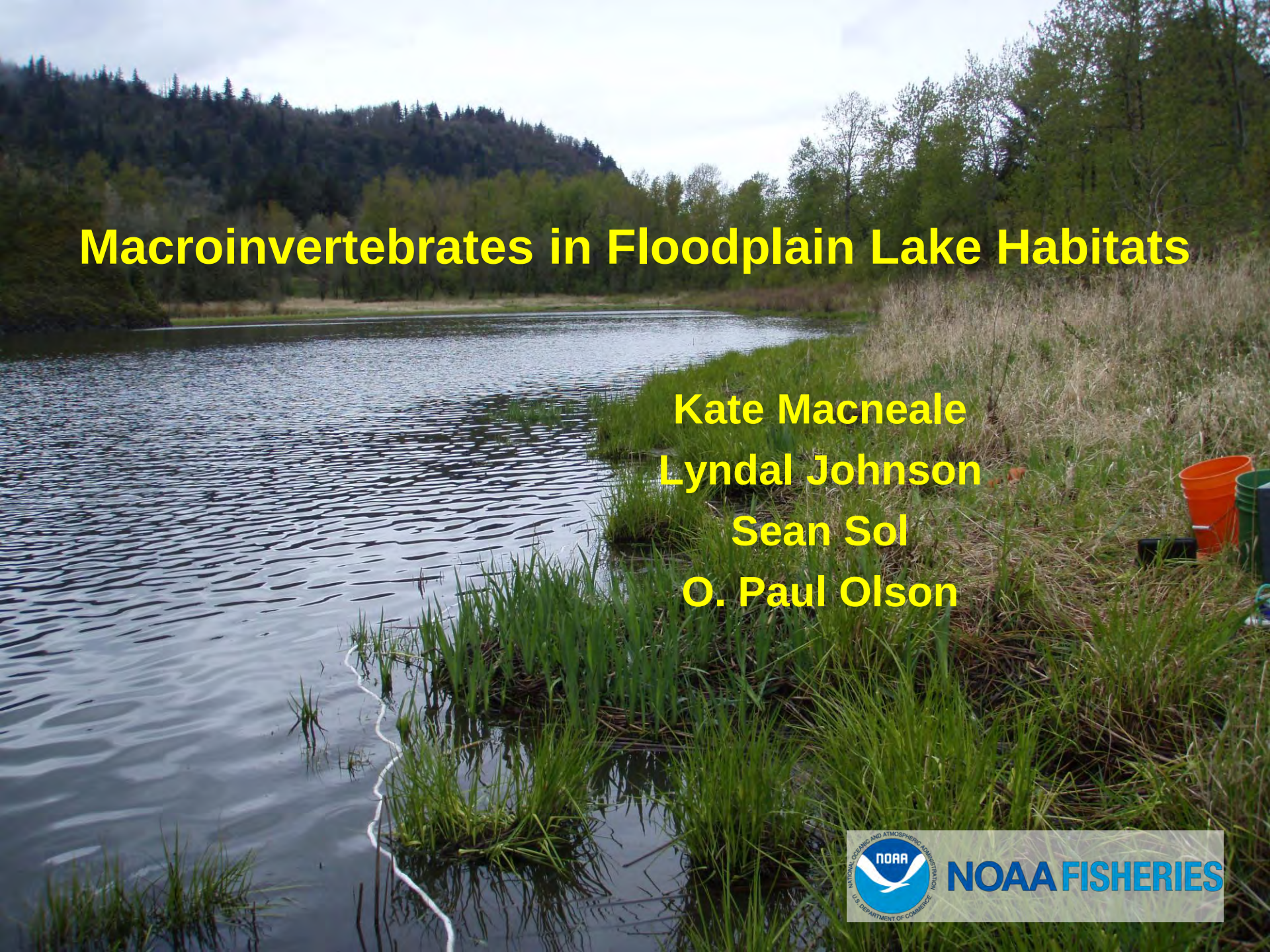

Macroinvertebrates in Floodplain Lake Habitats

Kate Macneale
Lyndal Johnson
Sean Sol
O. Paul Olson

NOAA FISHERIES

Our focus: macroinvertebrates as prey for juvenile Chinook salmon

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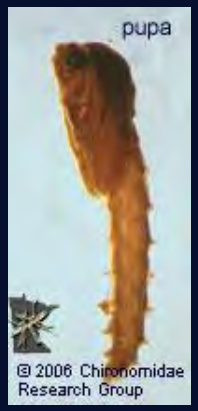
What they eat, then what they had to choose from

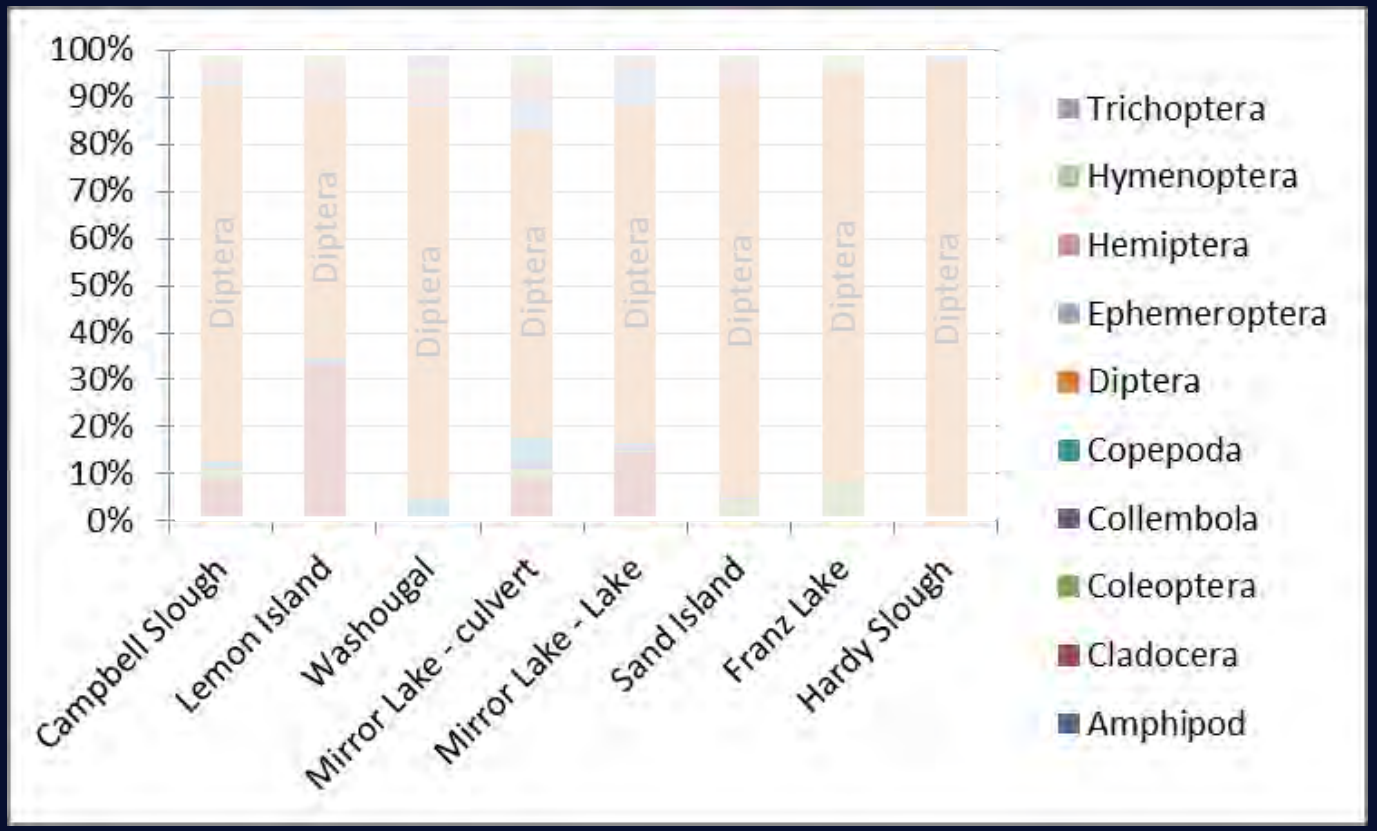
Our focus: macroinvertebrates as prey for juvenile Chinook salmon

What they eat, then what they had to choose from

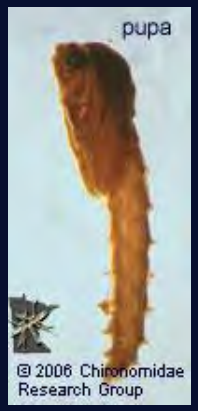
Speculate how attributes that distinguish floodplain lakes may affect salmon prey

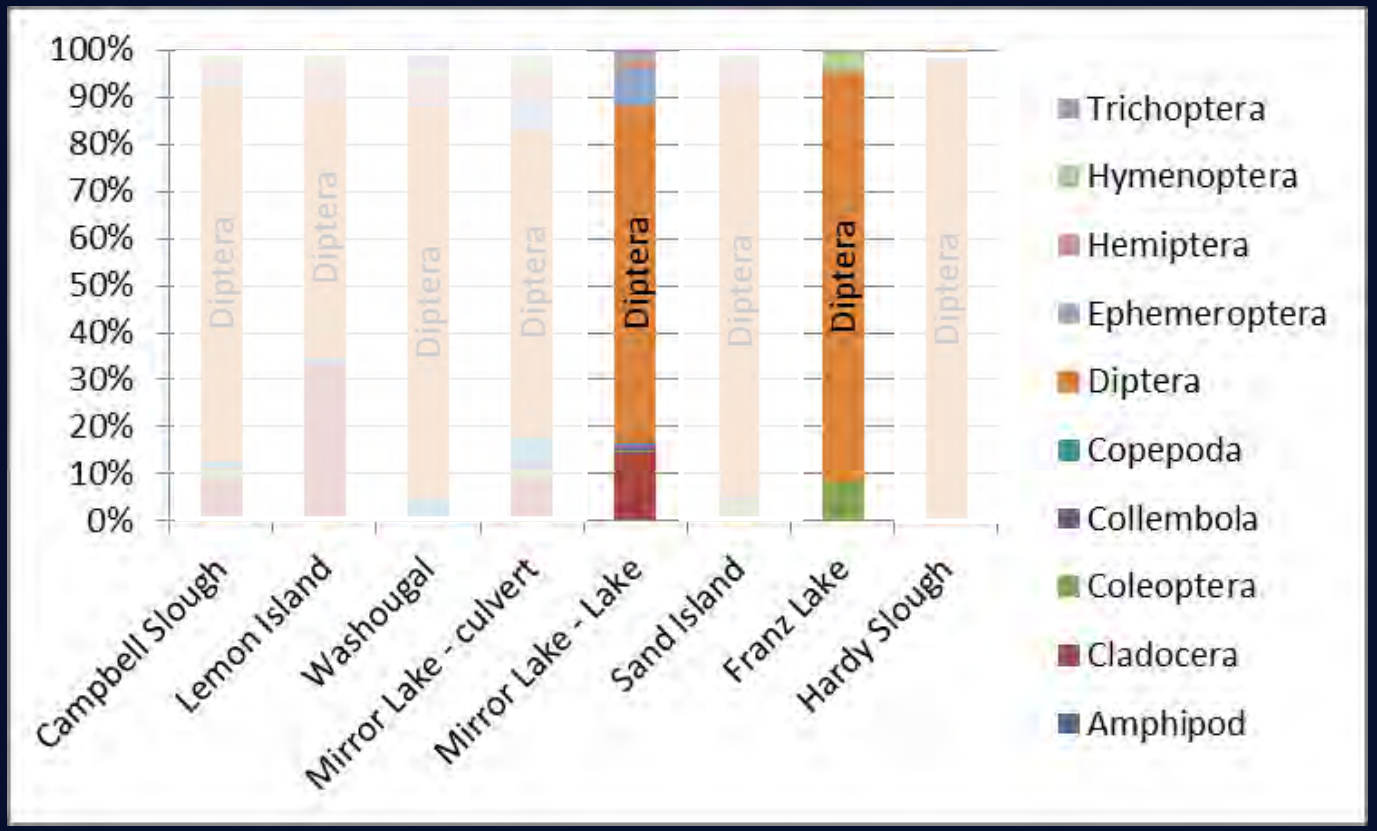
Composition of prey in juvenile Chinook salmon diets



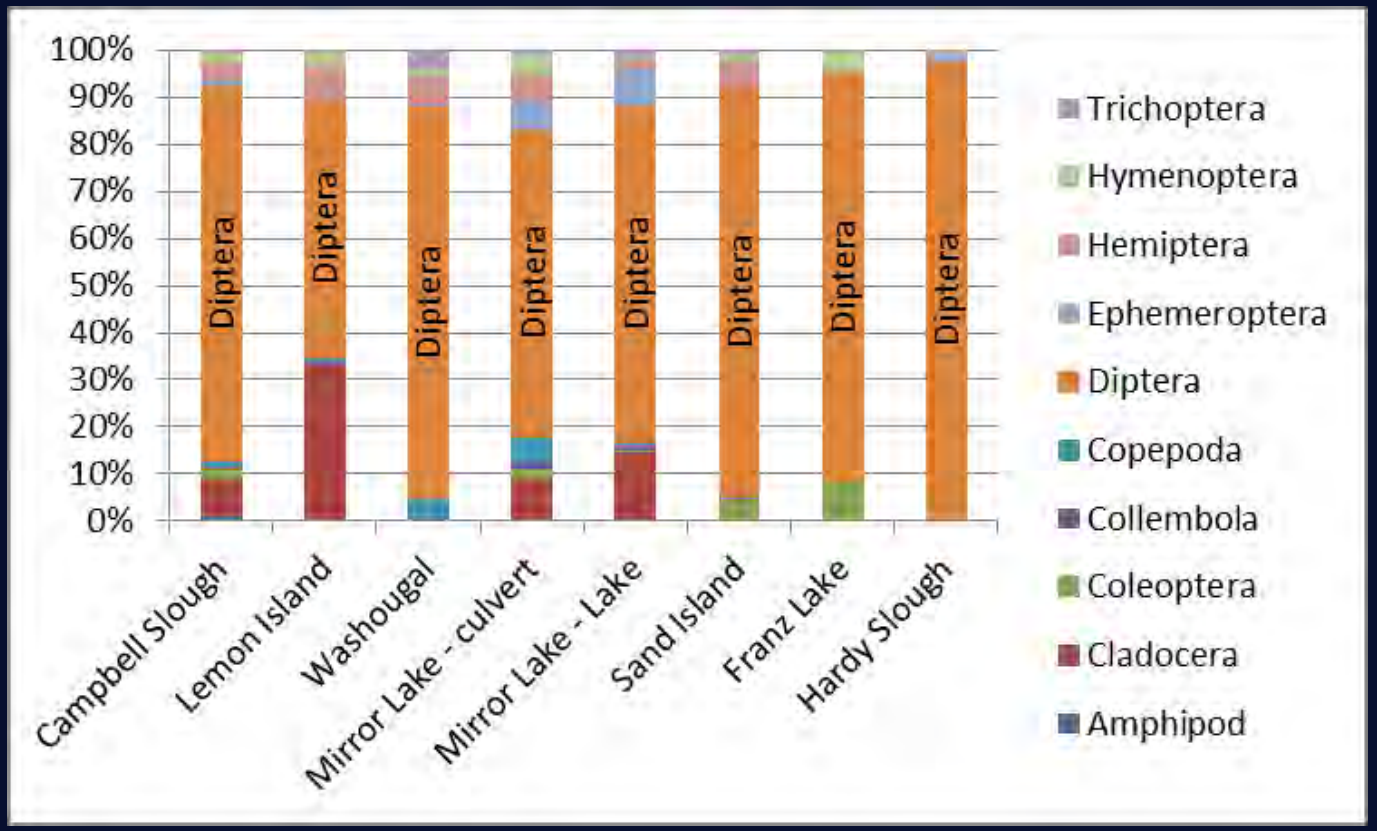


Diptera dominate juvenile Chinook salmon diets in floodplain lakes

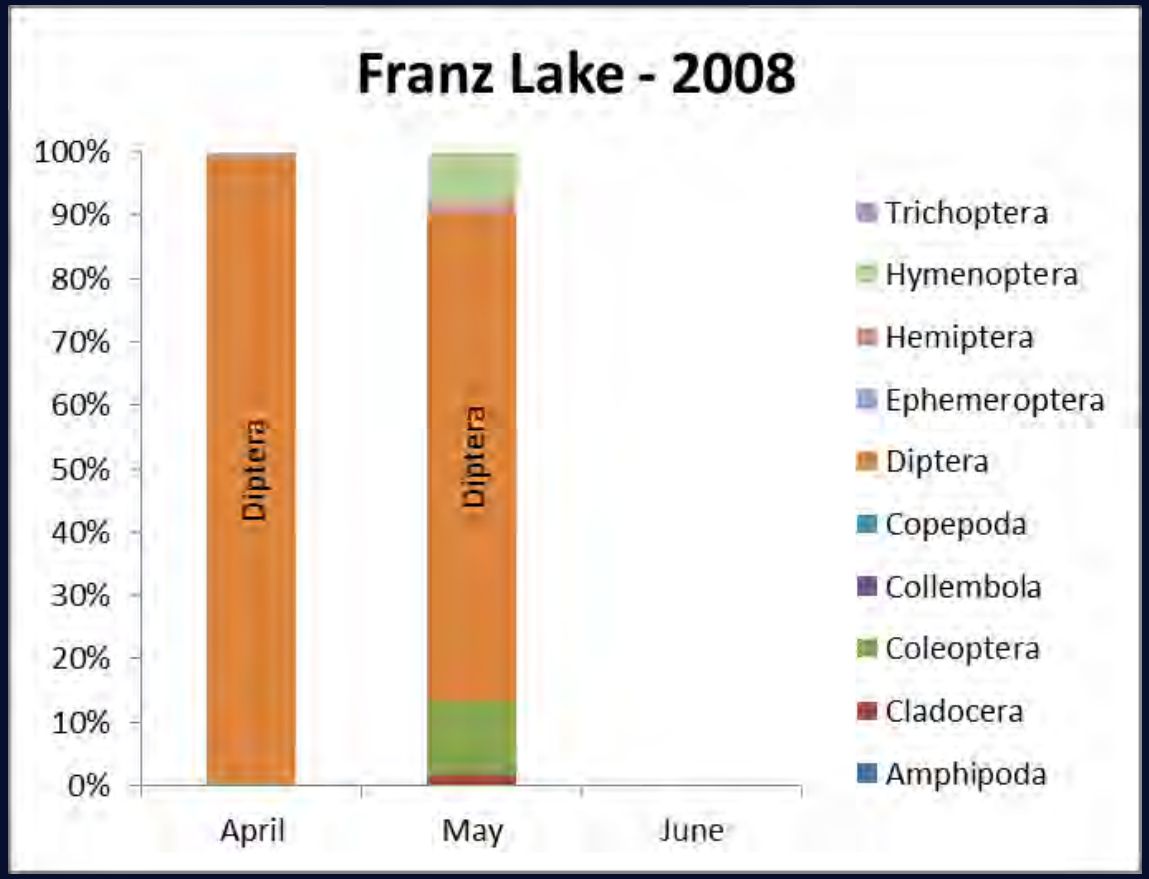


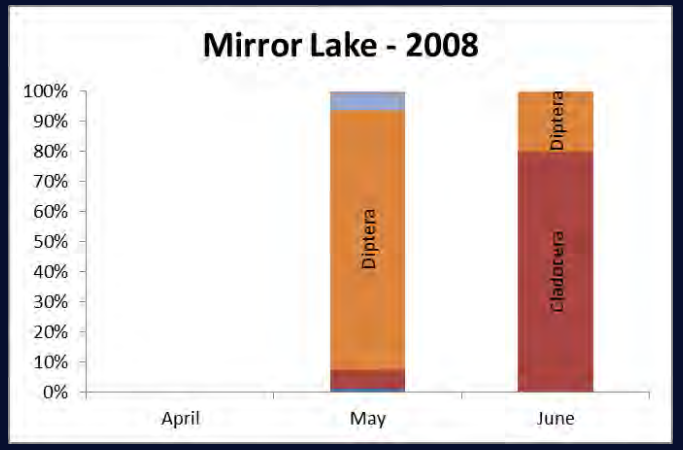


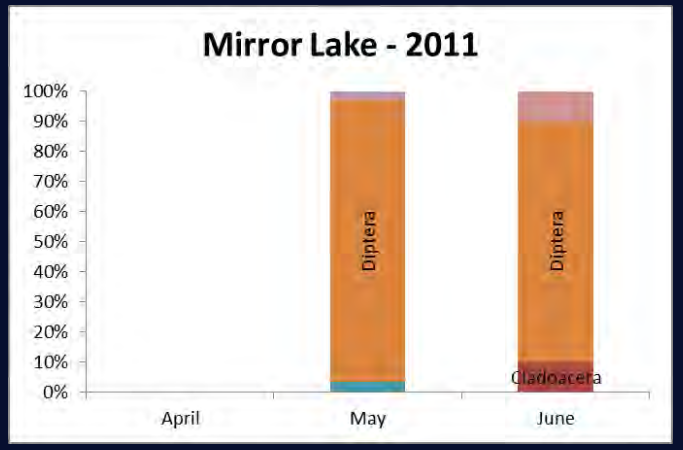
Diptera dominate diets in most sites

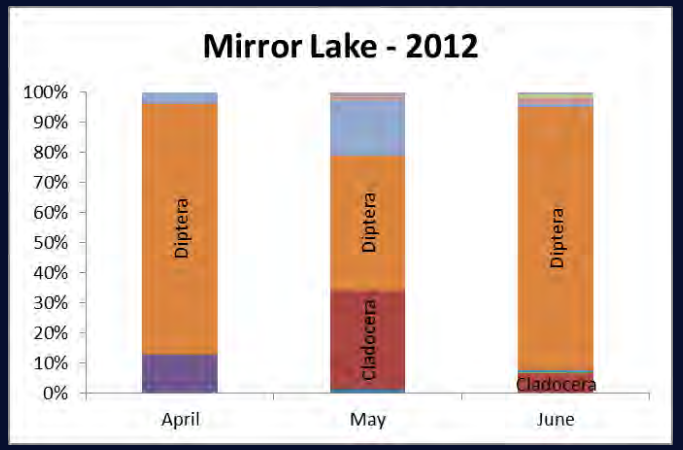


Composition of diets typically similar among months

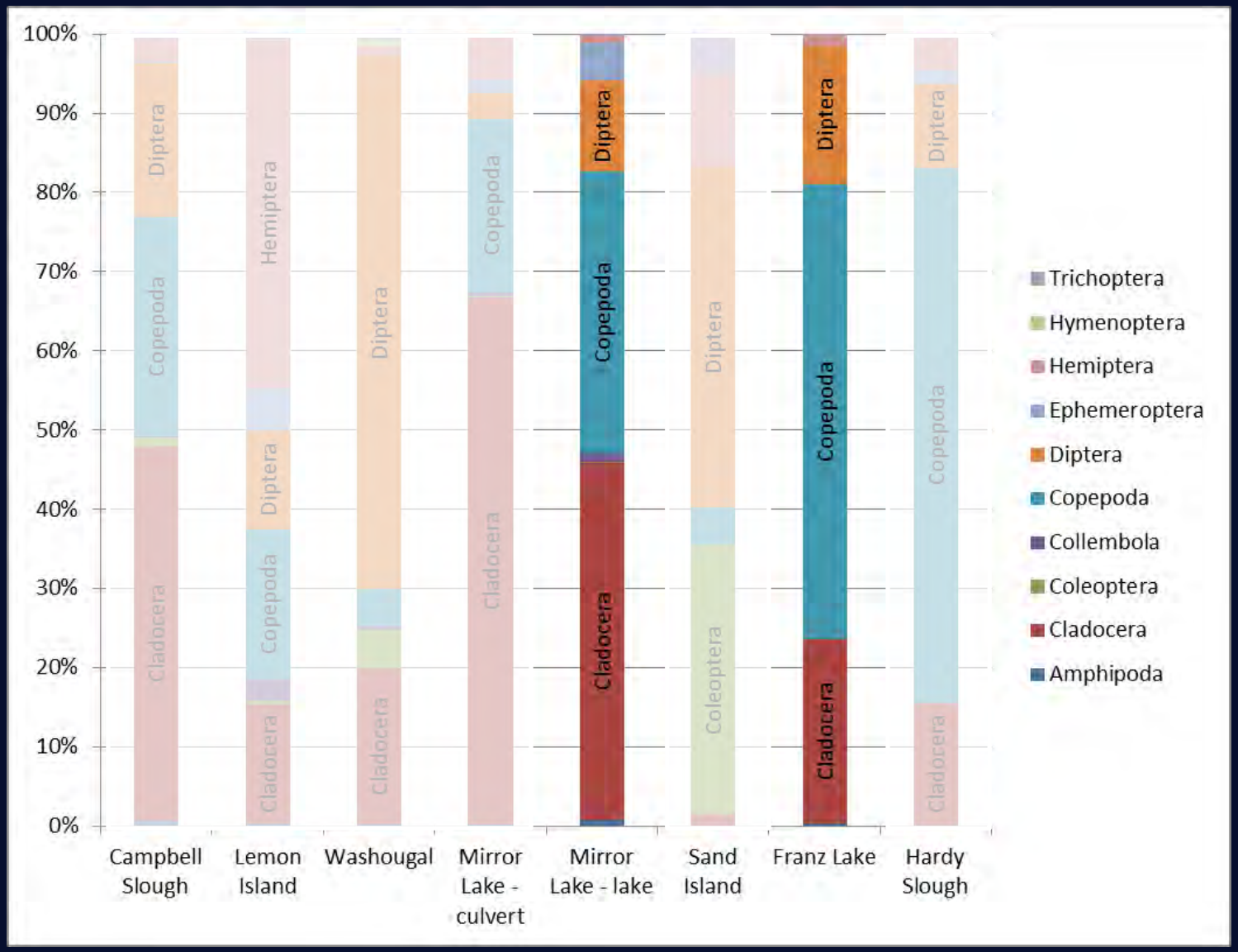




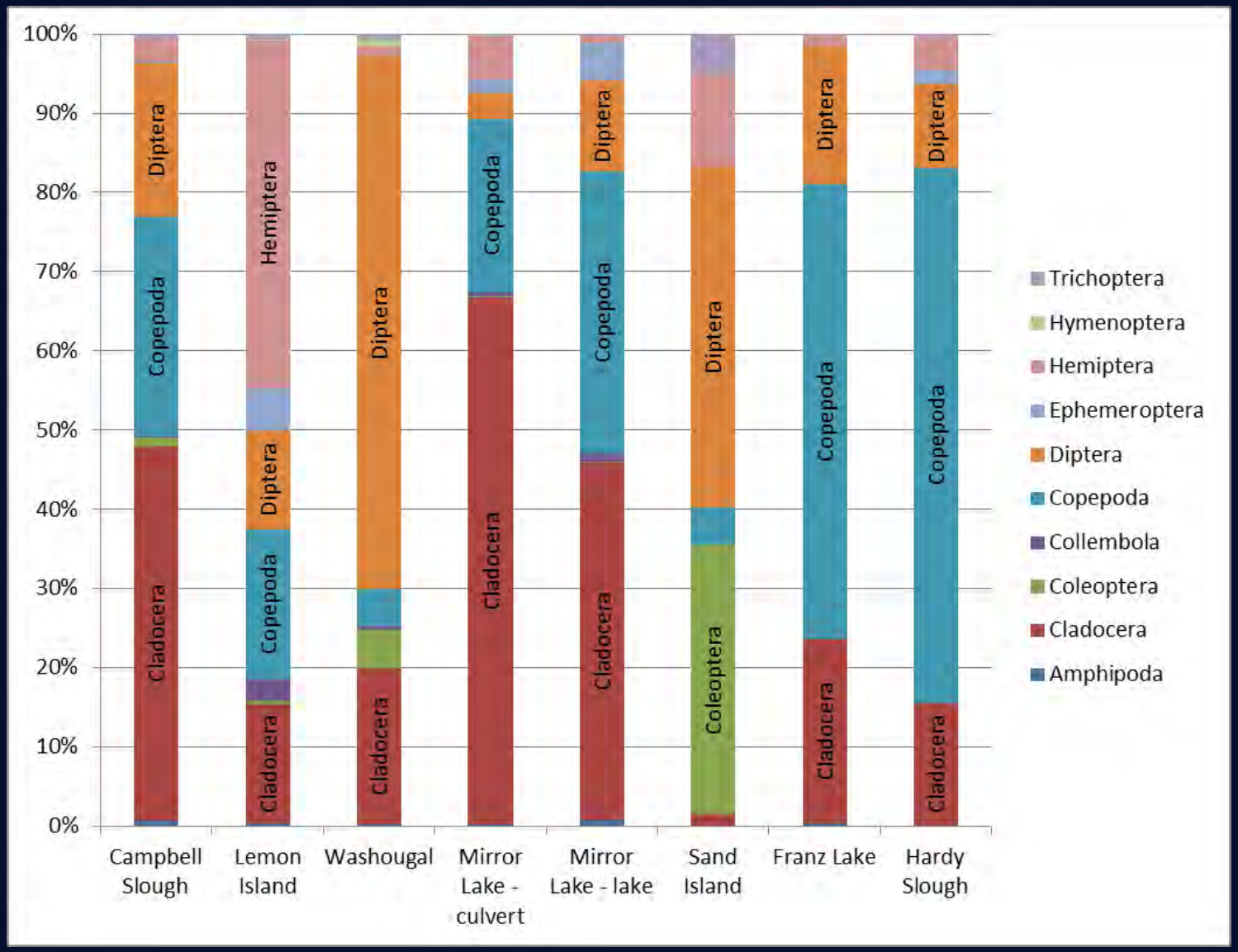




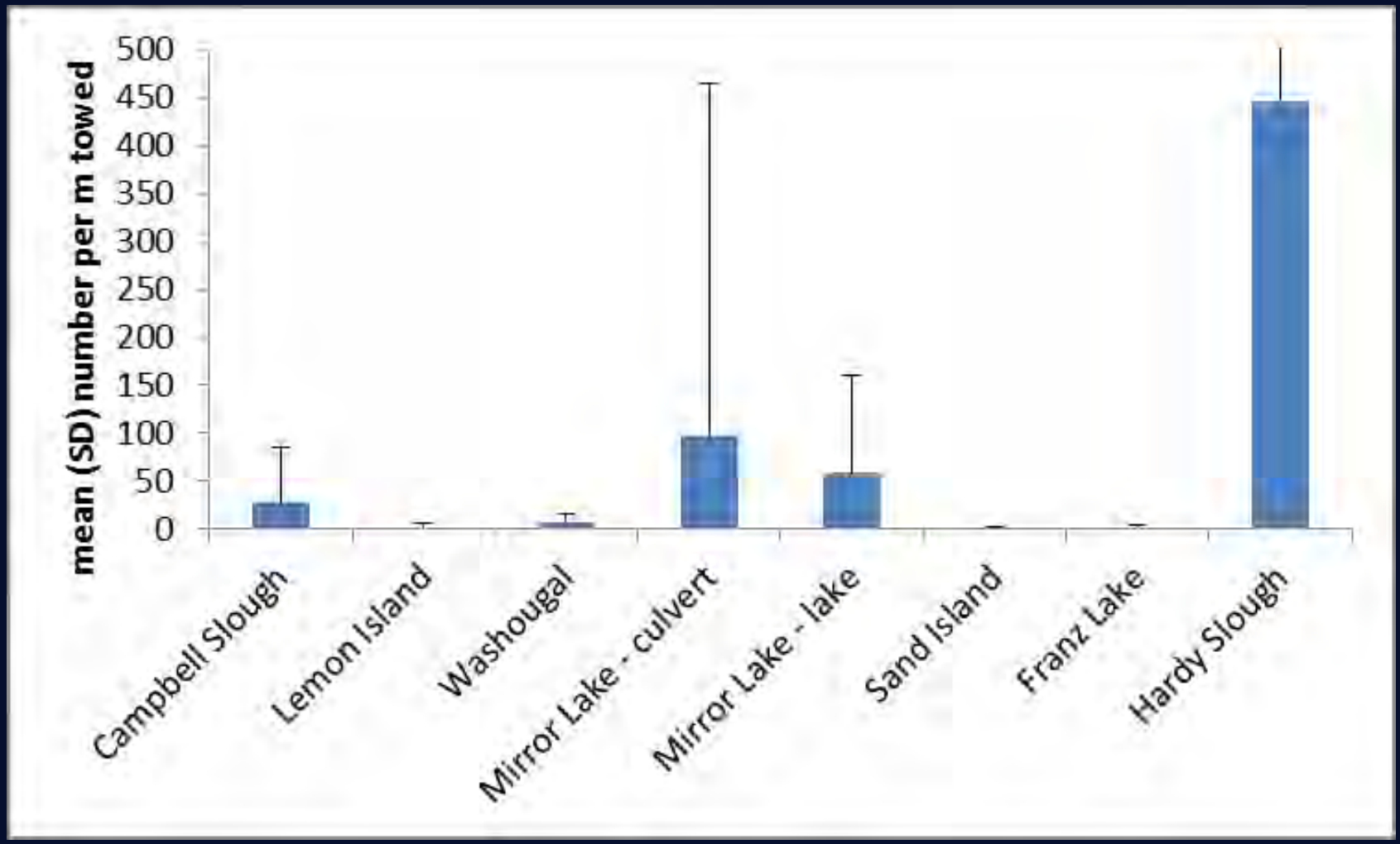
Macroinvertebrate community dominated by Copepods and Cladocerans

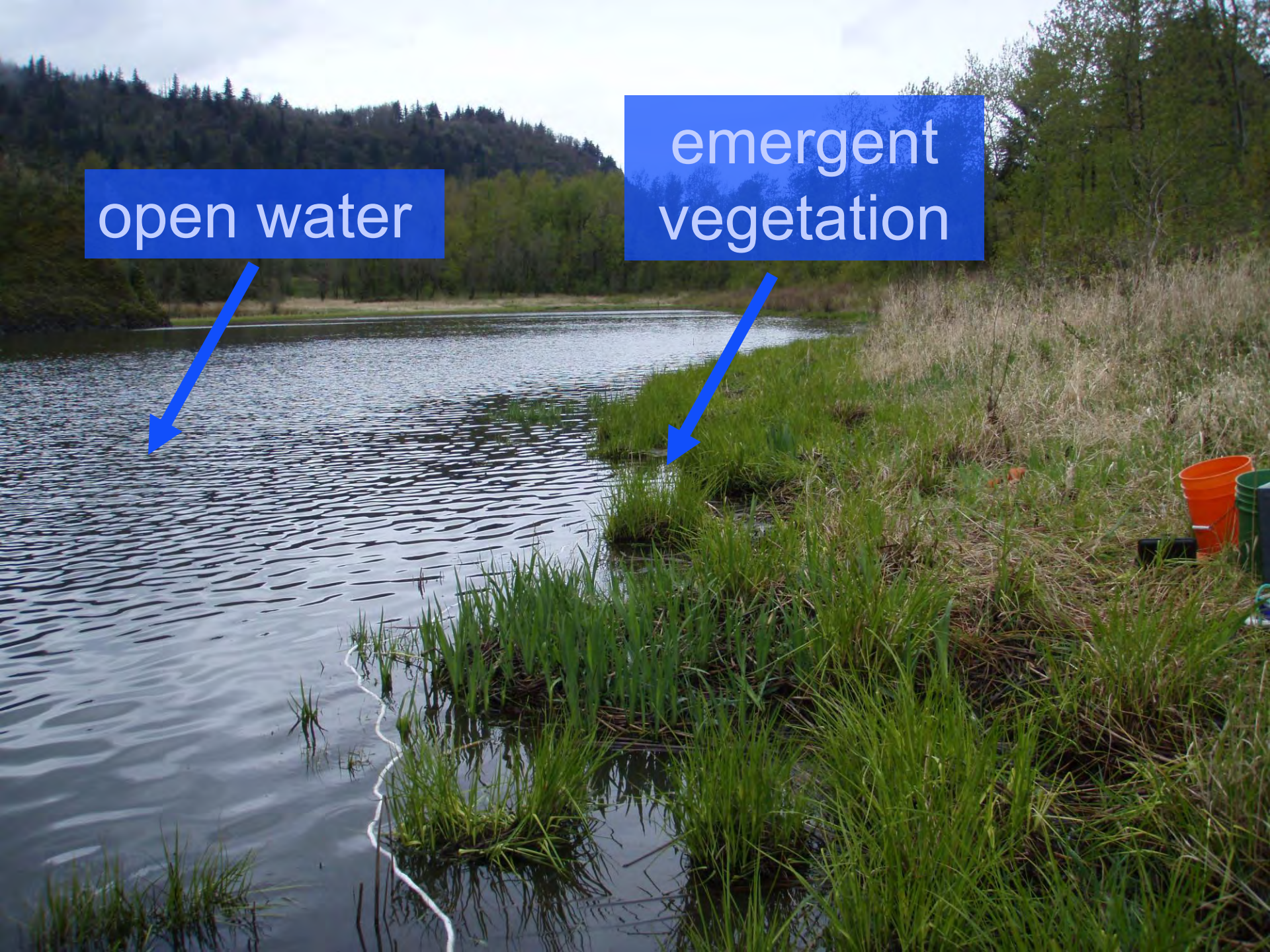


Macroinvertebrate community dominated by Copepods and Cladocerans

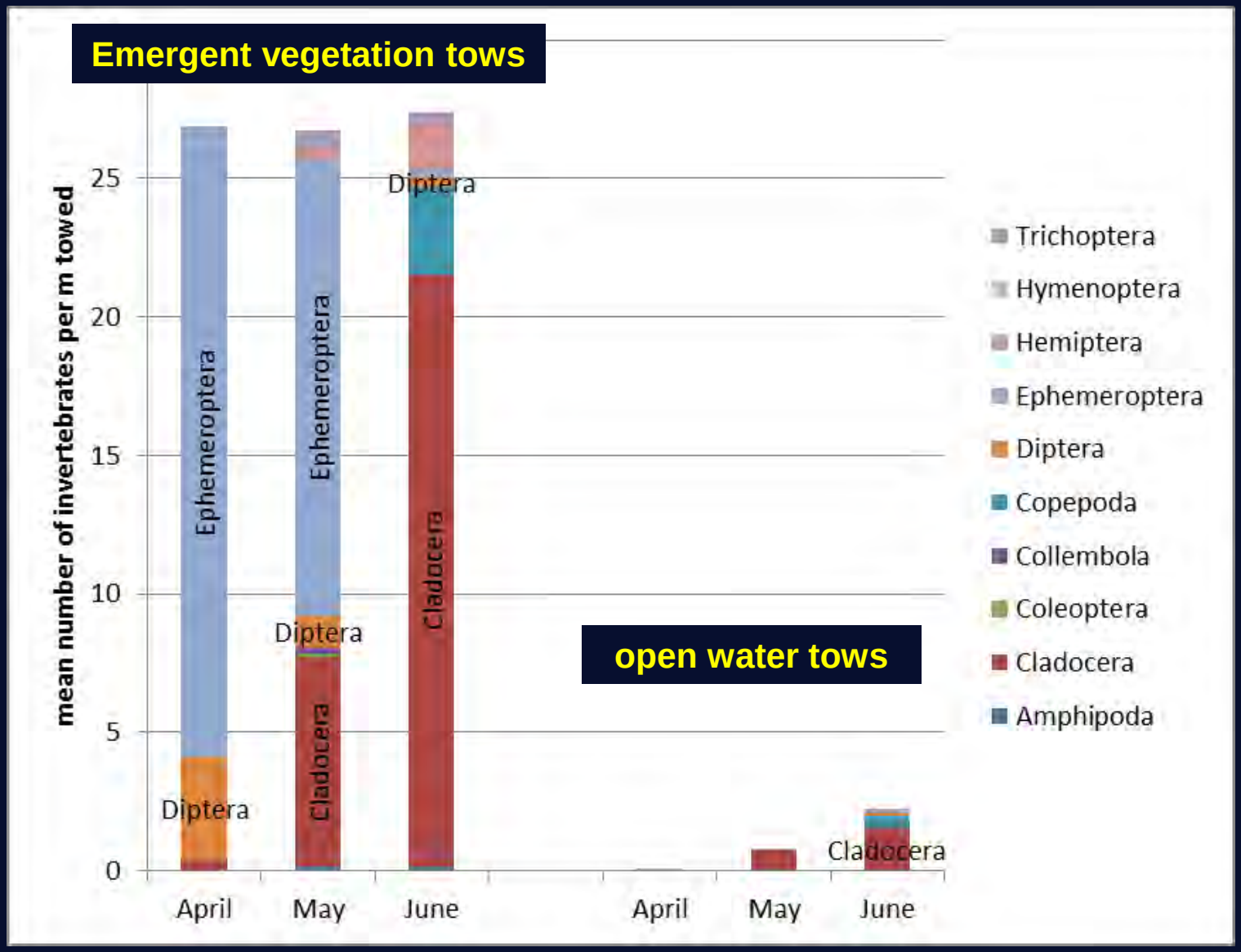


Density incredibly variable within and across sites




open water
emergent vegetation

Macroinvertebrate composition varies by month

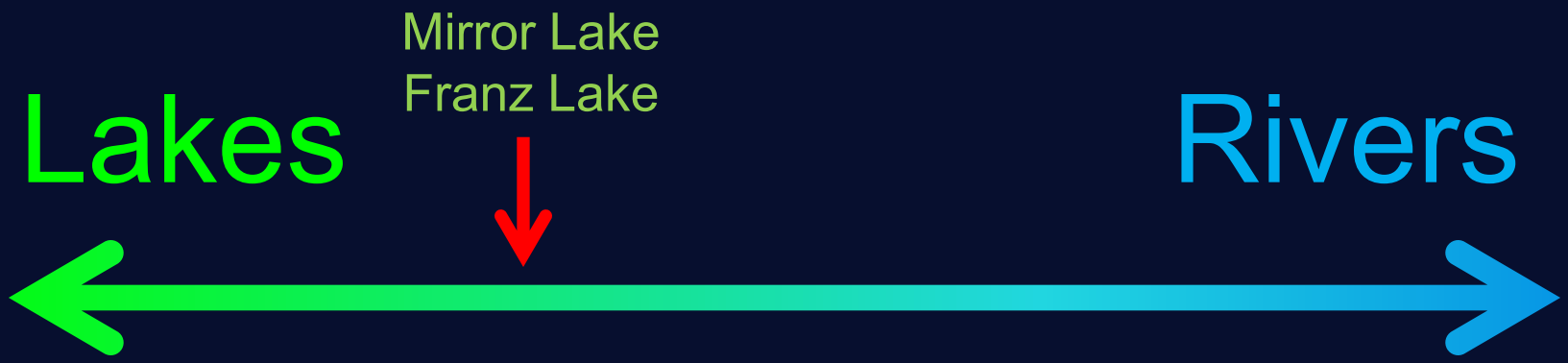


Mirror Lake 2012

Comparisons of habitats: for salmon

Salmon and their prey	Mirror Lake & Franz Lake	Other sites
• Cladocerans & Copepods typically dominate macroinvertebrate communities	yes	yes
• Salmon select Diptera	yes	yes
• Densities of preferred prey ~20x higher along margins compared to open water	yes	yes

more variable	Temperature	less variable
less dynamic	Hydrology	more dynamic
more important	Autochthonous production	less important



more variable	Temperature	less variable
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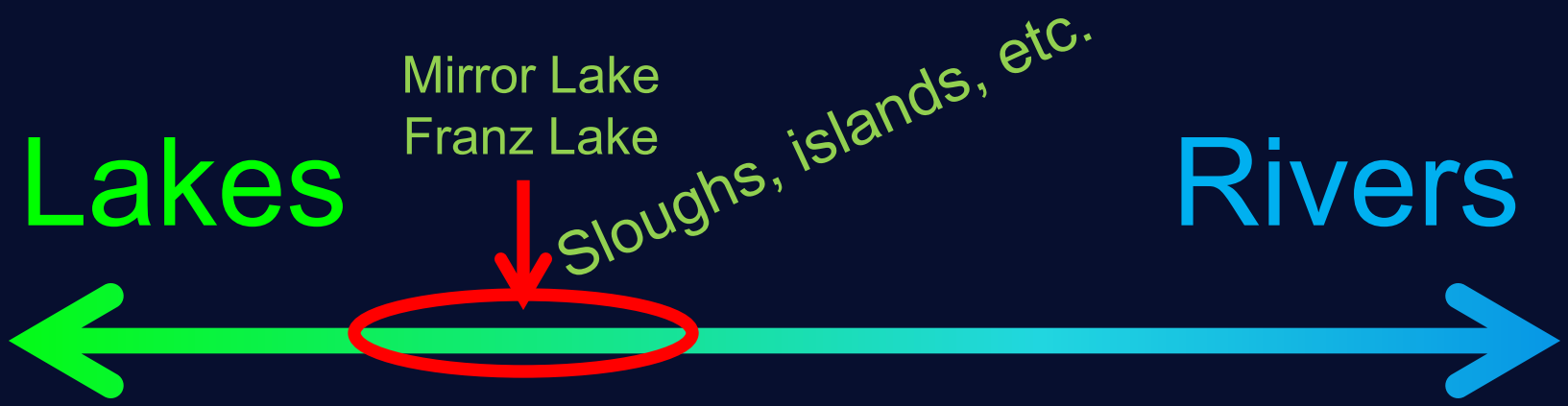


more variable	Temperature	less variable
less dynamic	Hydrology	more dynamic
more important	Autochthonous production	less important

Macroinvertebrates in floodplain lake habitats

- Composition of salmonid prey similar across habitats *when salmon are present*
- Salmon diets similar across habitats
- Preferred prey most abundant in marginal habitats with emergent vegetation in all habitats

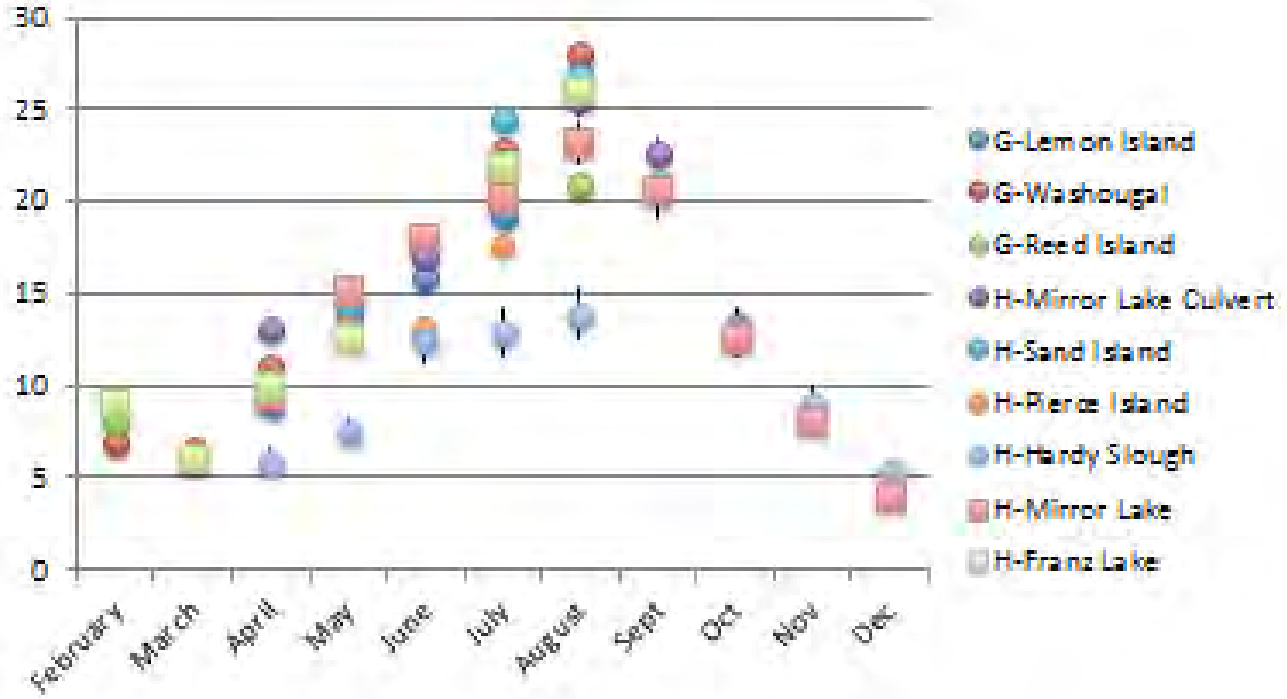
- Floodplain lakes may be quite distinct in other measures and in other seasons, but no clear trends in macroinvertebrates distinguish these from other sites used by salmon in these reaches

Thank you!

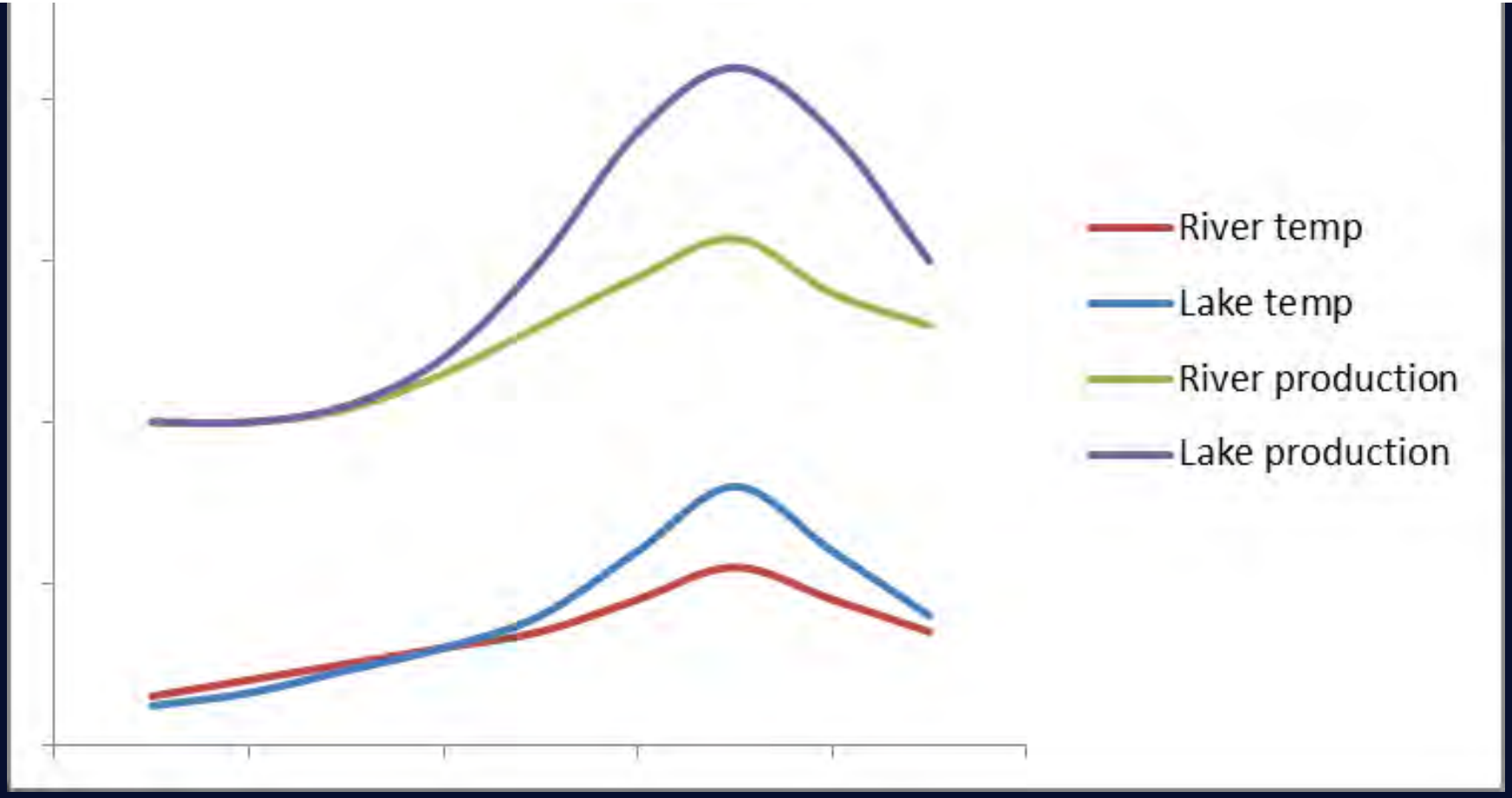

Source of C, N & P
for Diptera?

Source of C, N & P for Diptera?

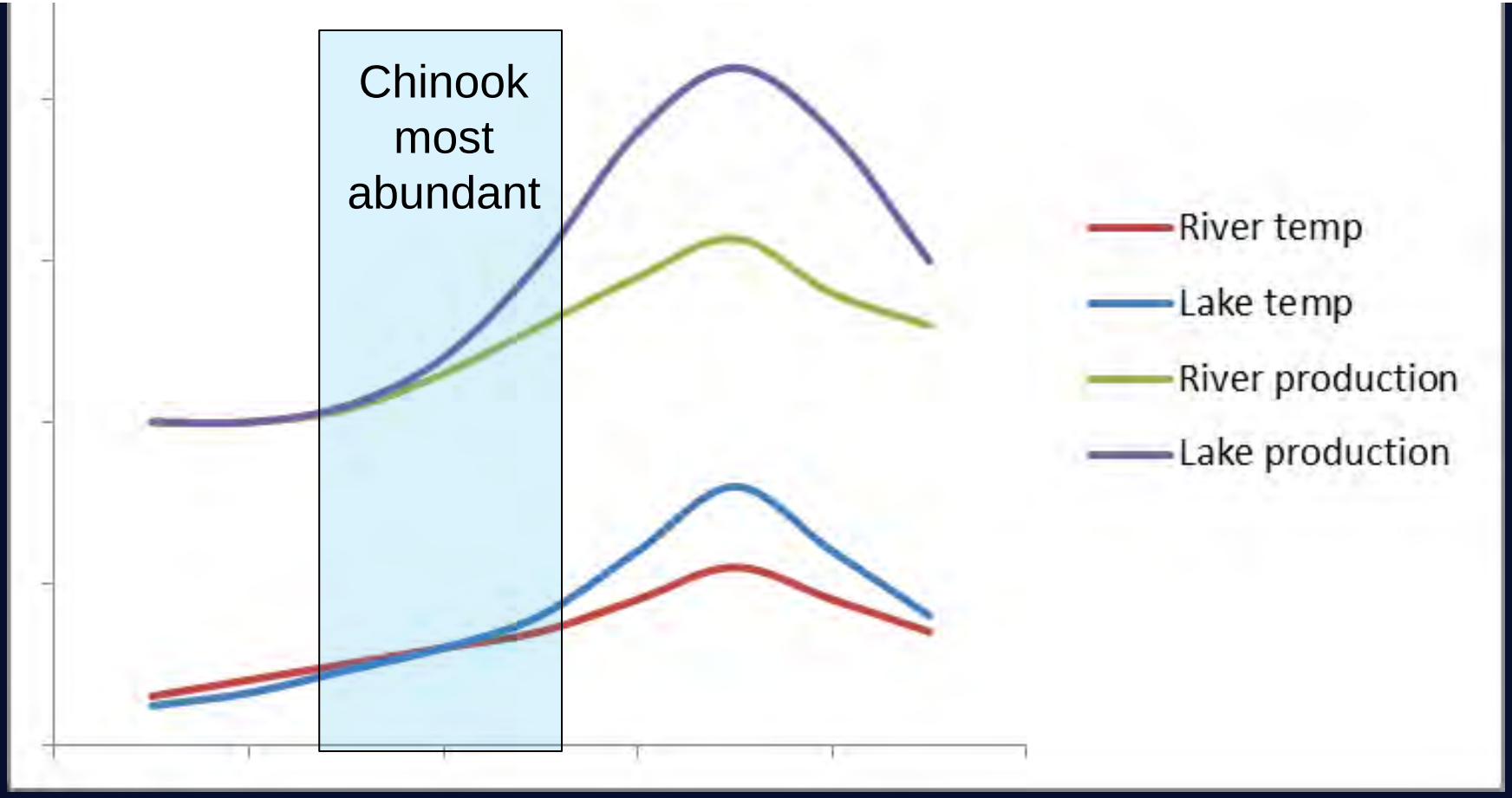
Water temperature



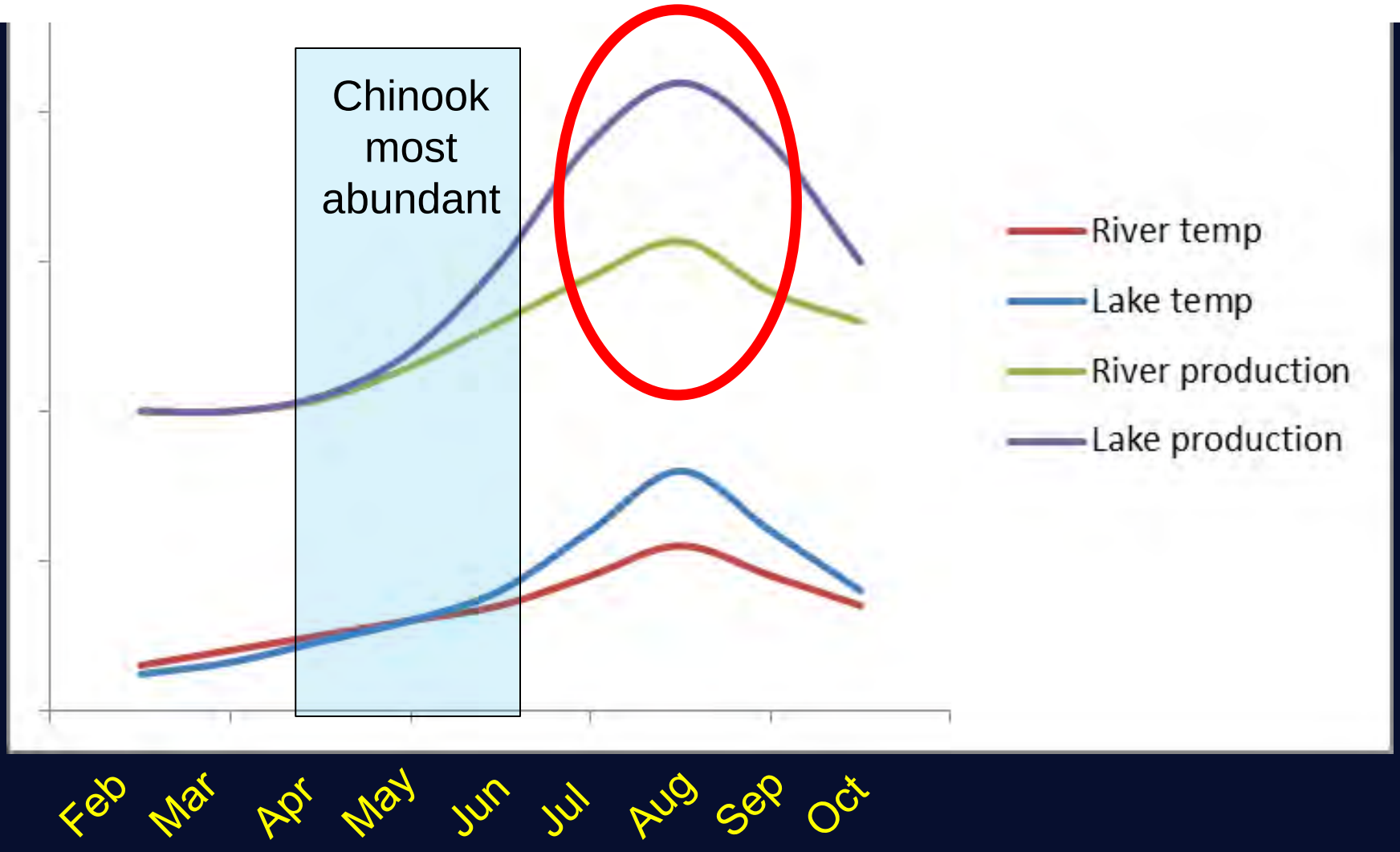
River vs. Lake habitats in spring and summer

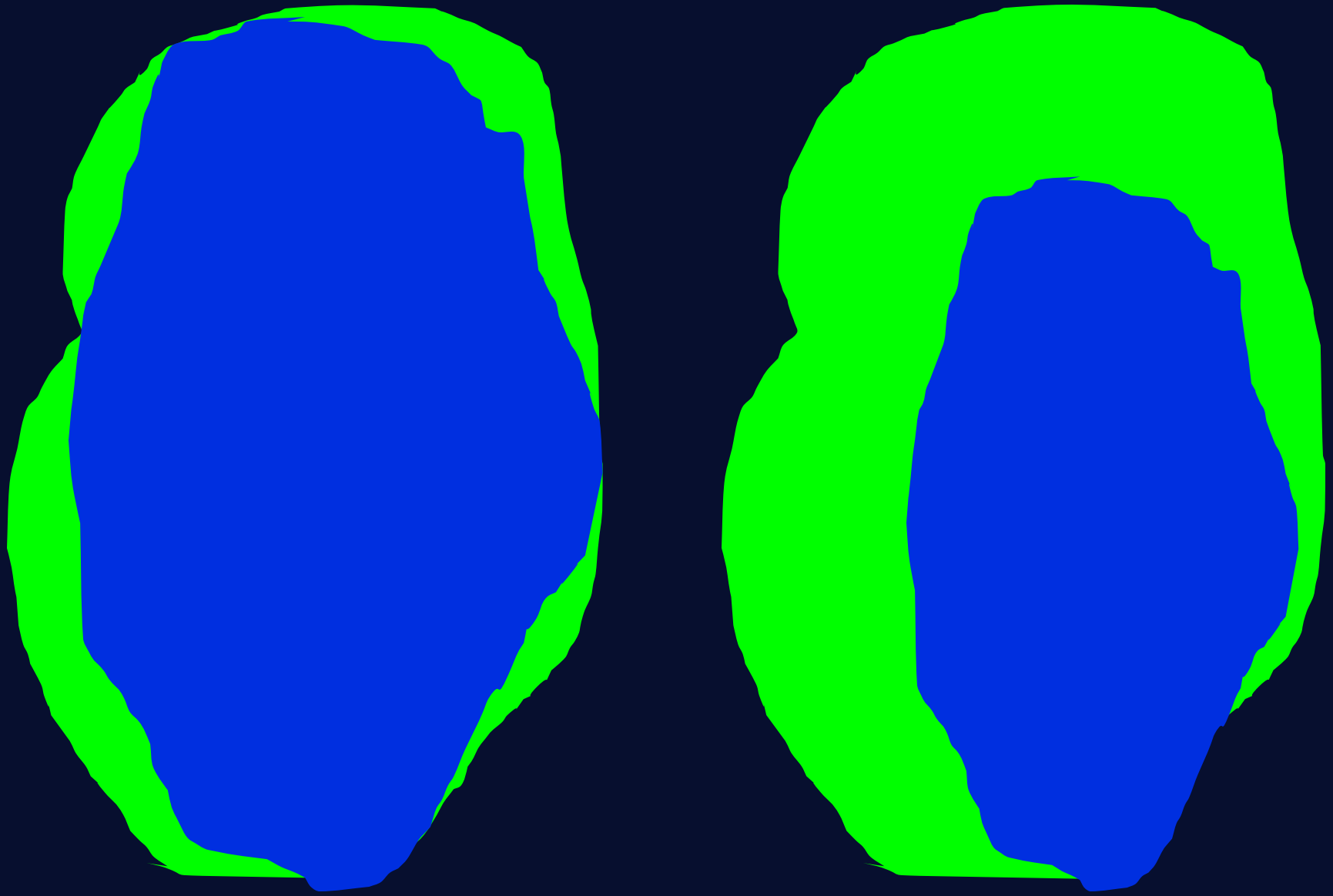


River vs. Lake habitats in spring and summer

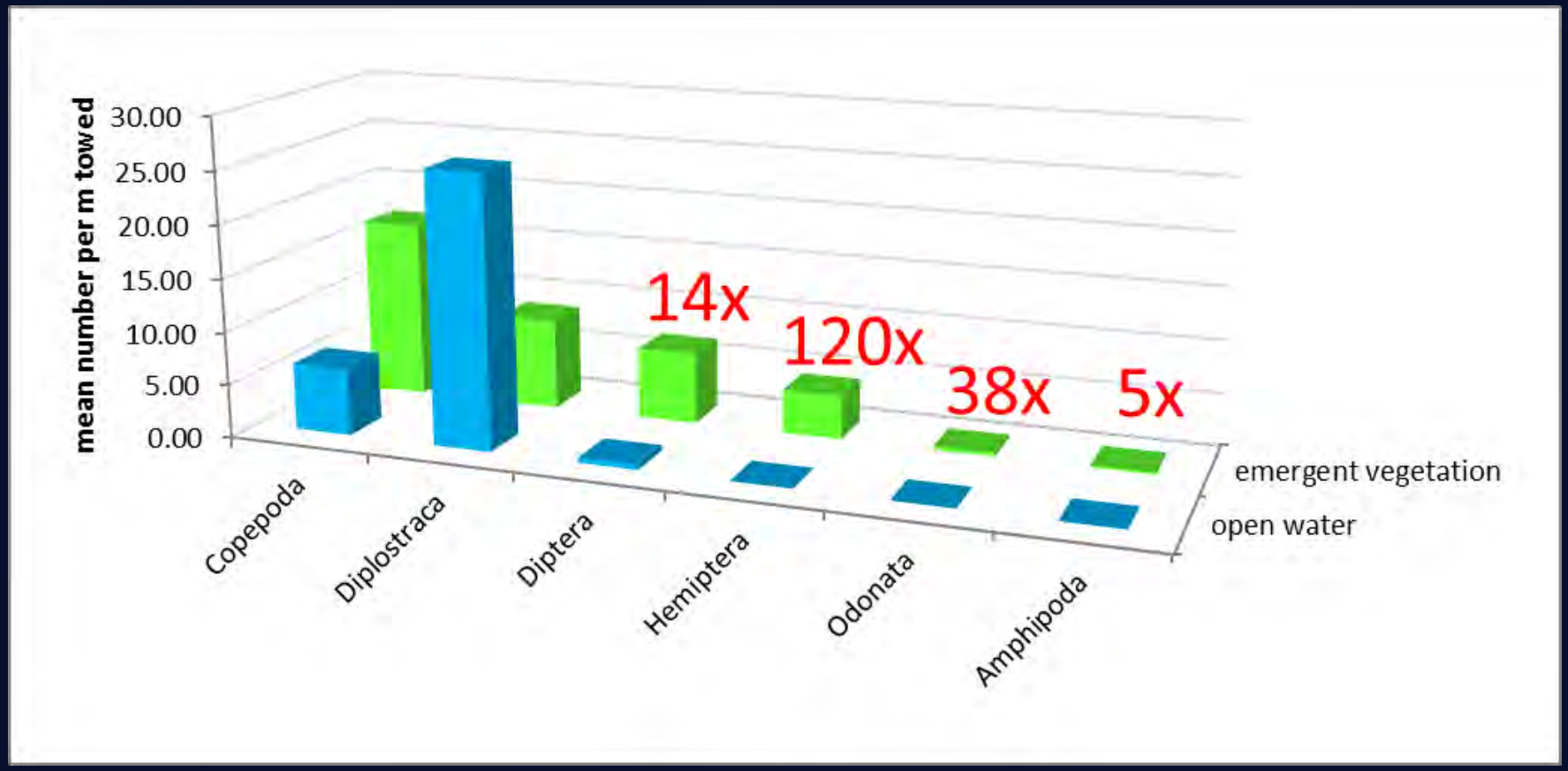


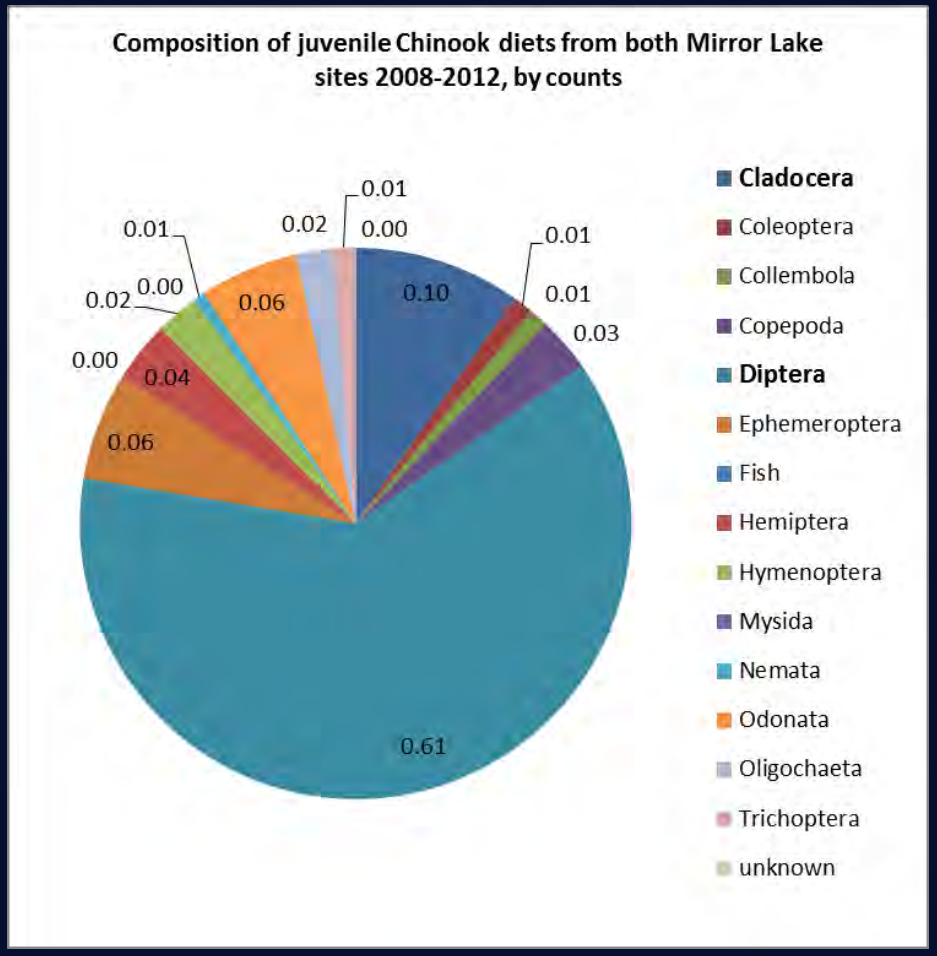
Lakes vs. Rivers in spring and summer

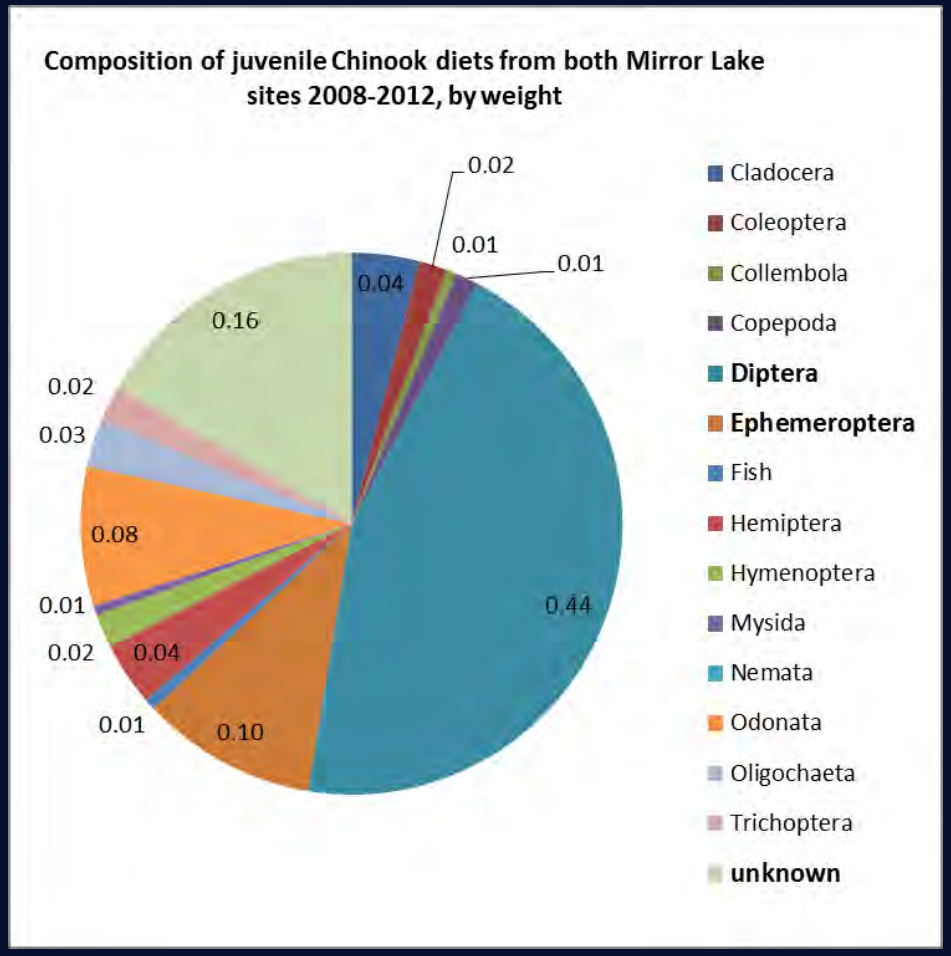




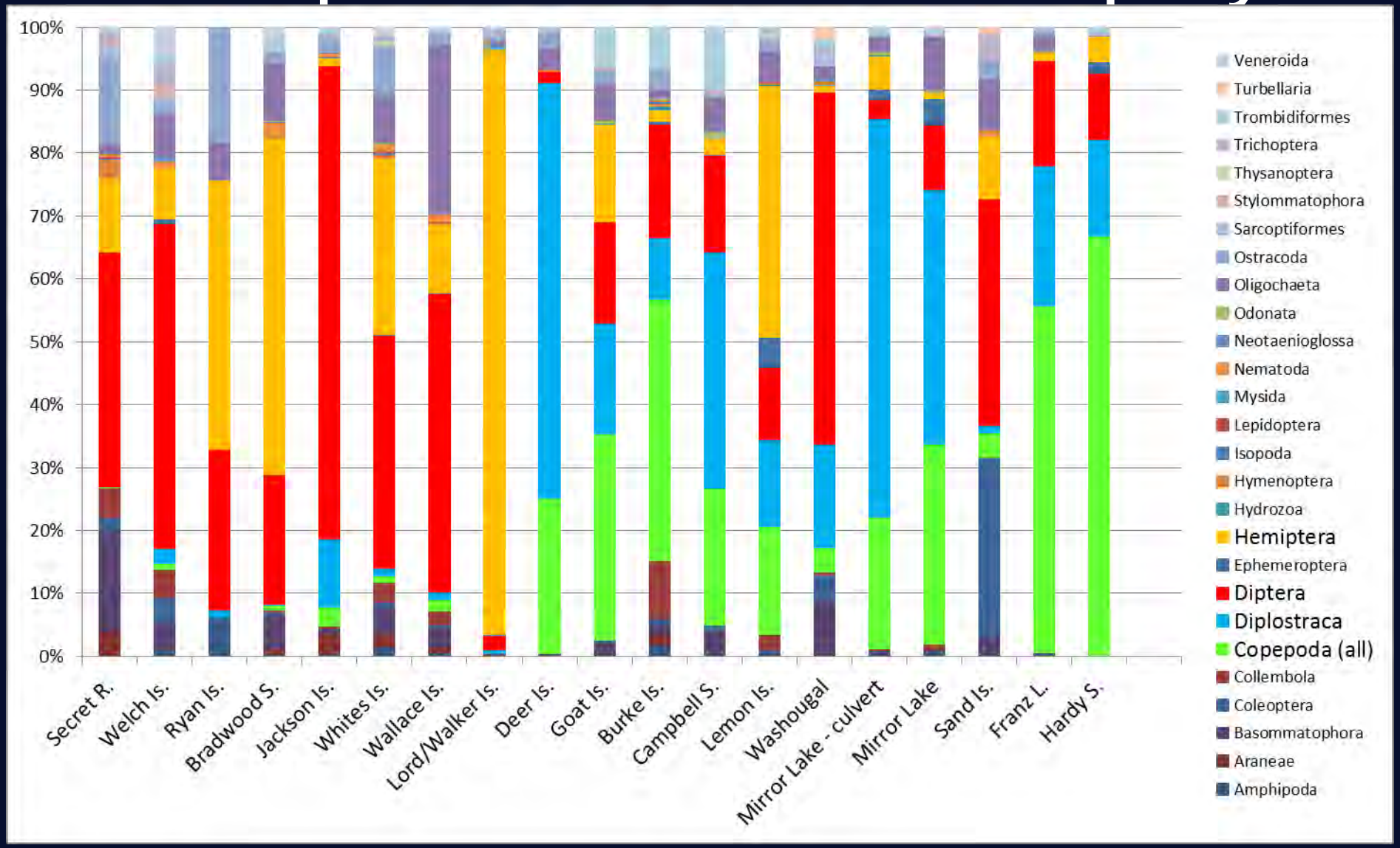
Source of preferred prey items?
Emergent vegetation



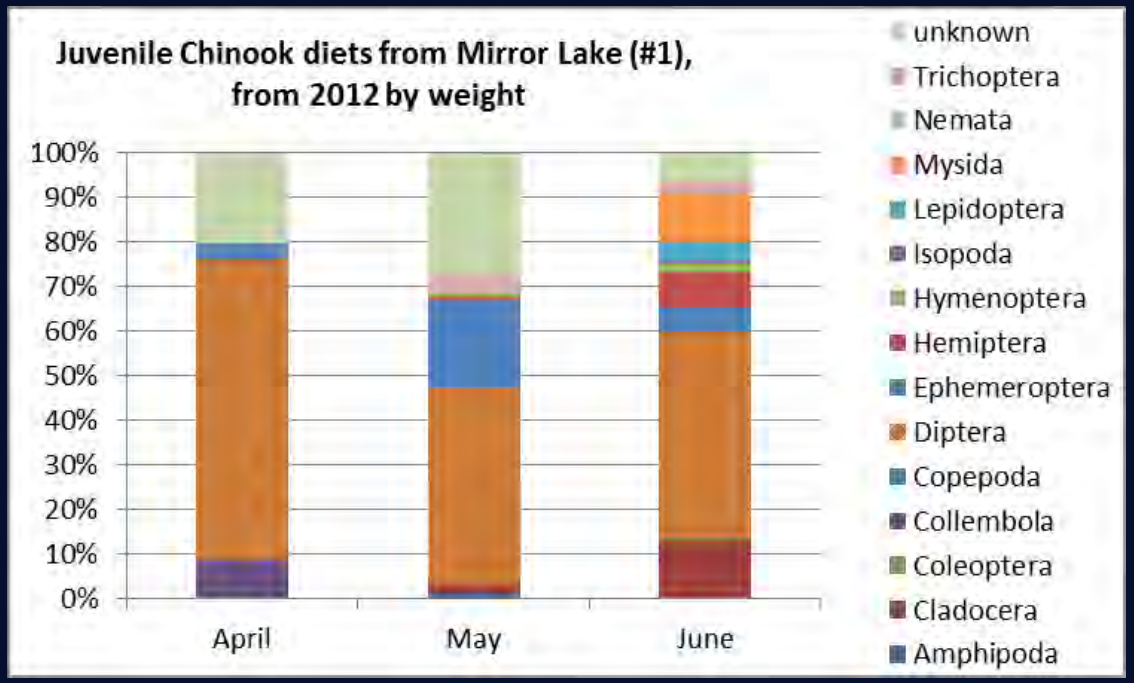

Composition of juvenile Chinook diets from both Mirror Lake sites 2008-2012, by counts
0.10
0.01
0.01
0.03
0.61
0.06
0.04
0.00
0.02
0.00
0.01
0.02
0.01
0.00
0.06
Cladocera
Coleoptera
Collembola
Copepoda
Diptera
Ephemeroptera
Fish
Hemiptera
Hymenoptera
Mysida
Nemata
Odonata
Oligochaeta
Trichoptera
unknown

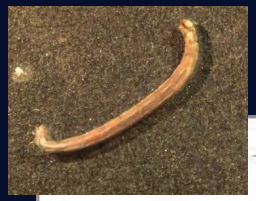

Composition of juvenile Chinook diets from both Mirror Lake sites 2008-2012, by weight
0.04
0.02
0.01
0.01
0.44
0.10
0.01
0.04
0.02
0.01
0.08
0.03
0.02
0.16
Cladocera
Coleoptera
Collembola
Copepoda
Diptera
Ephemeroptera
Fish
Hemiptera
Hymenoptera
Mysida
Nemata
Odonata
Oligochaeta
Trichoptera
unknown

Composition of available prey

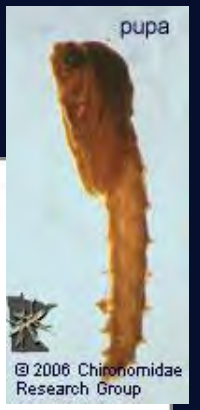


Composition of diets vary by month

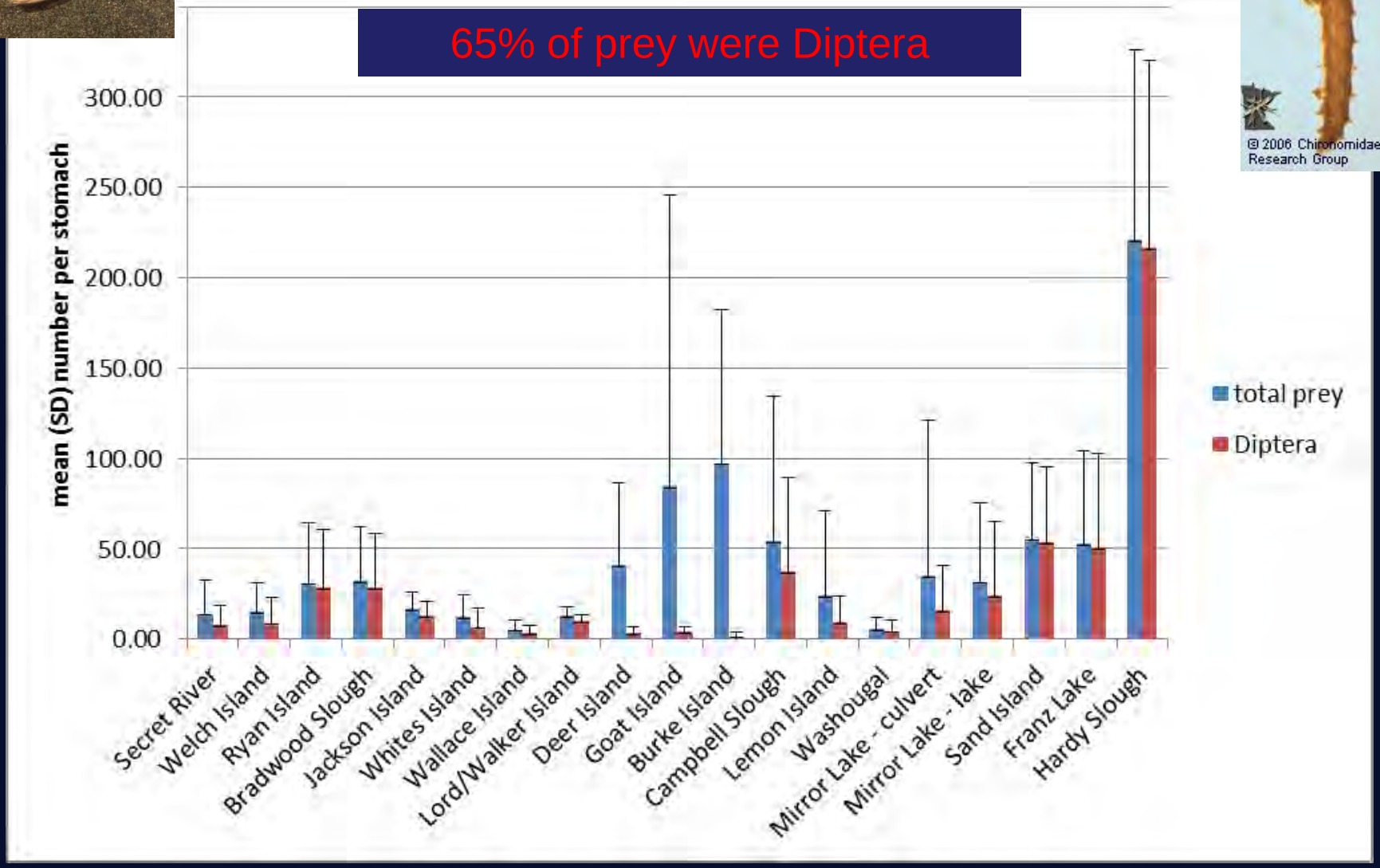




Consumed prey: Diptera



65% of prey were Diptera



For salmon, are floodplain lakes all that different?

Mirror and Franz lakes are similar to other sites

Comparisons of habitats: for whole community

Aquatic community	Floodplain lake habitats	Main channel river habitats
• Primary and secondary production	higher?	lower?
• Retention and cycling of C, N & P	higher?	lower?
• Importance of autochthonous inputs	higher?	lower?

River vs. Lake habitats in spring and summer