

# PCBs in our Watershed, PCBs in Products, and TSCA Exclusions: Putting It All Together

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# Key Questions

- Are iPCB concentrations exceeding allowable levels in consumer products?
- Are iPCB concentrations at problematic levels in the Spokane River?
- Outline
  - How much iPCB is allowed in products?
  - How much (and what form of) iPCB actually occurs in products?
  - How does this compare to what is allowed in the river?
  - How much iPCB is seen in the river?



# How Much iPCB Is Allowed in Products?

- Under TSCA, the inadvertent PCB concentrations in products:
  - must average less than 25 ppm, and
  - can be no higher than 50 ppm
- For compliance determinations, concentrations of monochloro-biphenyls are divided by 10, and dichloro-biphenyls are divided by 5.
- For a product containing only PCB-11, therefore, PCB concentrations:
  - must average less than 125\* ppm, and
  - can be no higher than 250\*\* ppm

\*i.e. 25 ppm x 5

\*\*i.e. 50 ppm x 5



# How Much Actually Occurs in Products?

- Washington Department of Ecology and USEPA have been testing products for presence of iPCBs
  - Ecology: Stone, 2016
    - <https://fortress.wa.gov/ecy/publications/SummaryPages/1604014.html>
    - 201 products tested
  - EPA: Liu and Mullen, 2019
    - [http://srттf.org/wp-content/uploads/2019/08/2-PCB-Products-ISESISIAQ-082019-V6\\_SRRTTF.pdf](http://srттf.org/wp-content/uploads/2019/08/2-PCB-Products-ISESISIAQ-082019-V6_SRRTTF.pdf)
    - 16 products tested



# Ecology Product Testing

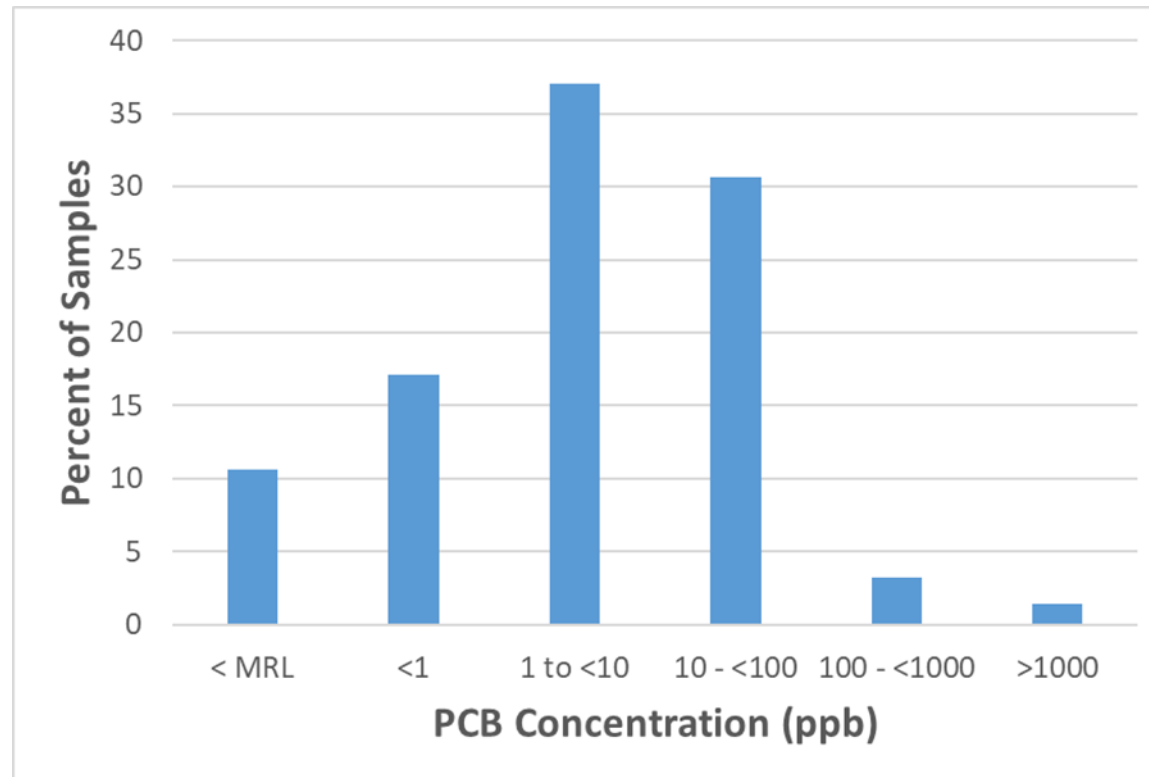
- Objectives
  - Evaluate whether consumer products contain PCBs, and, if found
    - evaluate the contribution from organic pigments and dyes using PCB-11 as an indicator species
    - evaluate the range and amounts of PCBs
- 216 samples from 201 different products

Category	Count	Category	Count
Caulks	8	Misc.	2
Children's Products	14	Office	17
Clothing	5	Paints/Colorants/Dyes	24
Comic Books	10	Pesticides/Lawn and Road Care	19
Containers/Boxes (paper)	31	Plastics	17
Cosmetics/Body Care	11	Printed Material/Newsprint	12
Labels	35	Road Paints	11
		Total =	216



# Ecology Product Testing

- Ecology findings
  - 89% of products had detectable total PCBs
  - 30.6% of were between 10 and 100 ppb
  - 4.6% were >100 ppb
  - 1.3% were >100 ppb



# Ecology Product Testing

- Three samples had PCB > 1000 ppb
  - Cereal packaging = 2,320 ppb
  - Yellow foam = 2,310 ppb
  - Child's yellow sidewalk chalk = 1,060 ppb
- PCB-11 accounted for 99% of the total PCB in these samples



# EPA Product Testing

- Objectives
  - Characterize potential sources of PCBs in consumer products
  - Evaluate alternative extraction methods for analyzing PCBs
- 16 different products tested





# EPA Product Testing

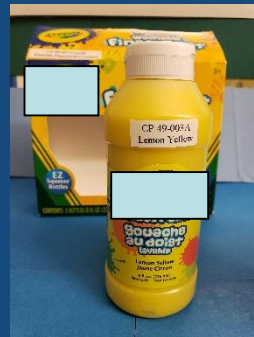
16 products tested



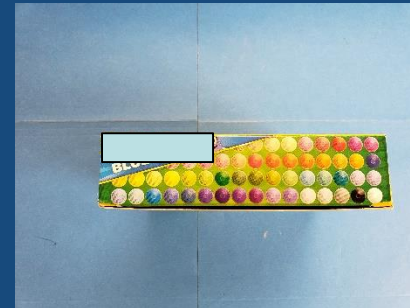
Modeling Dough



Art Paint



Finger Paint



Crayons



Sidewalk  
Chalk



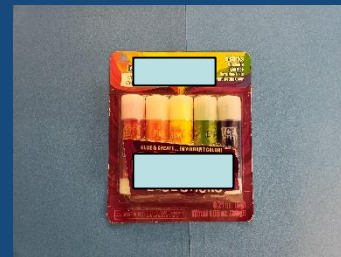
Wafers Box



Art Chalk



Chalk Paint



Glue Sticks



Foam Sheet



Glitter Foam Sheet



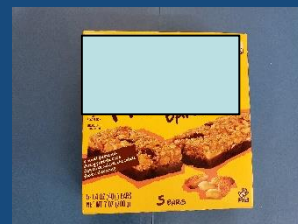
Sidewalk Paint  
Powder



Cereal Box



Cereal Box



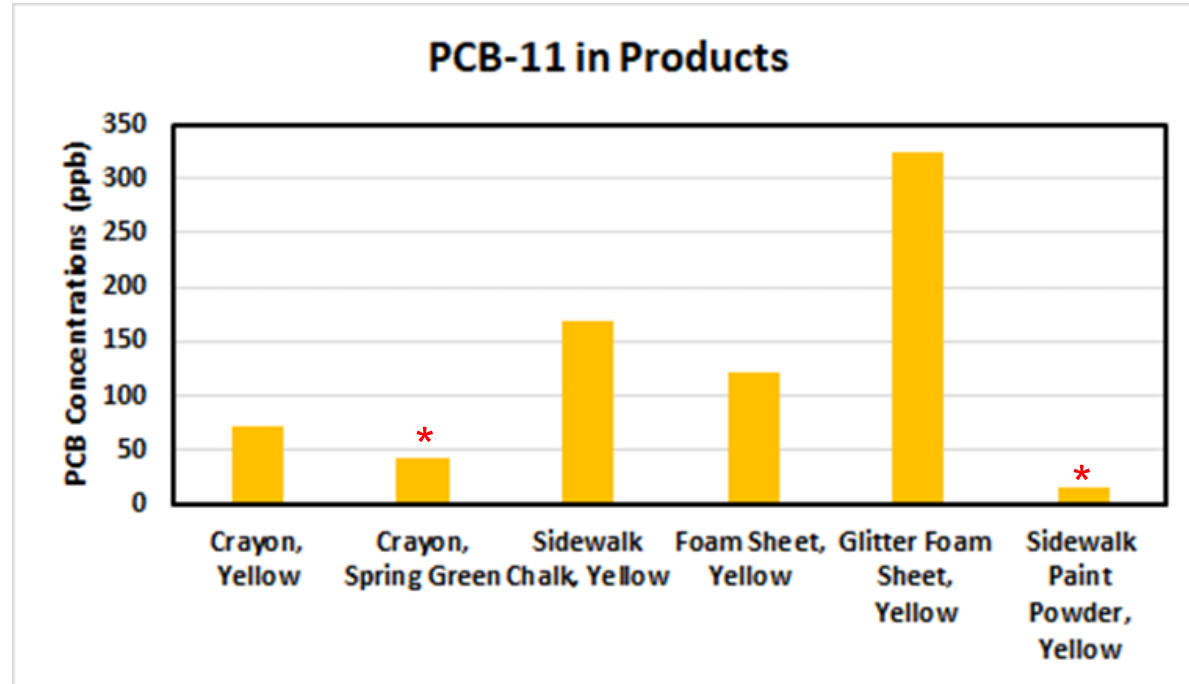
Protein Bar Box



Cereal Bag

# EPA Findings

- 7 out of 16 products had detectable PCBs
- Concentrations up to 325 ppb
- 6 out of 7 products detected PCB-11 only



\* Concentration below the lowest calibration but above the instrument detection limit



# Product Testing Conclusions

- Most products tested had detectable levels of PCBs
- PCB-11 was the dominant congener found
- Observed levels were well within compliance with TSCA limits
  - Highest observed concentration was 2,320 ppb, i.e. 2.3 ppm
  - TSCA requires concentrations less than 25 ppm (125 ppm for PCB-11)



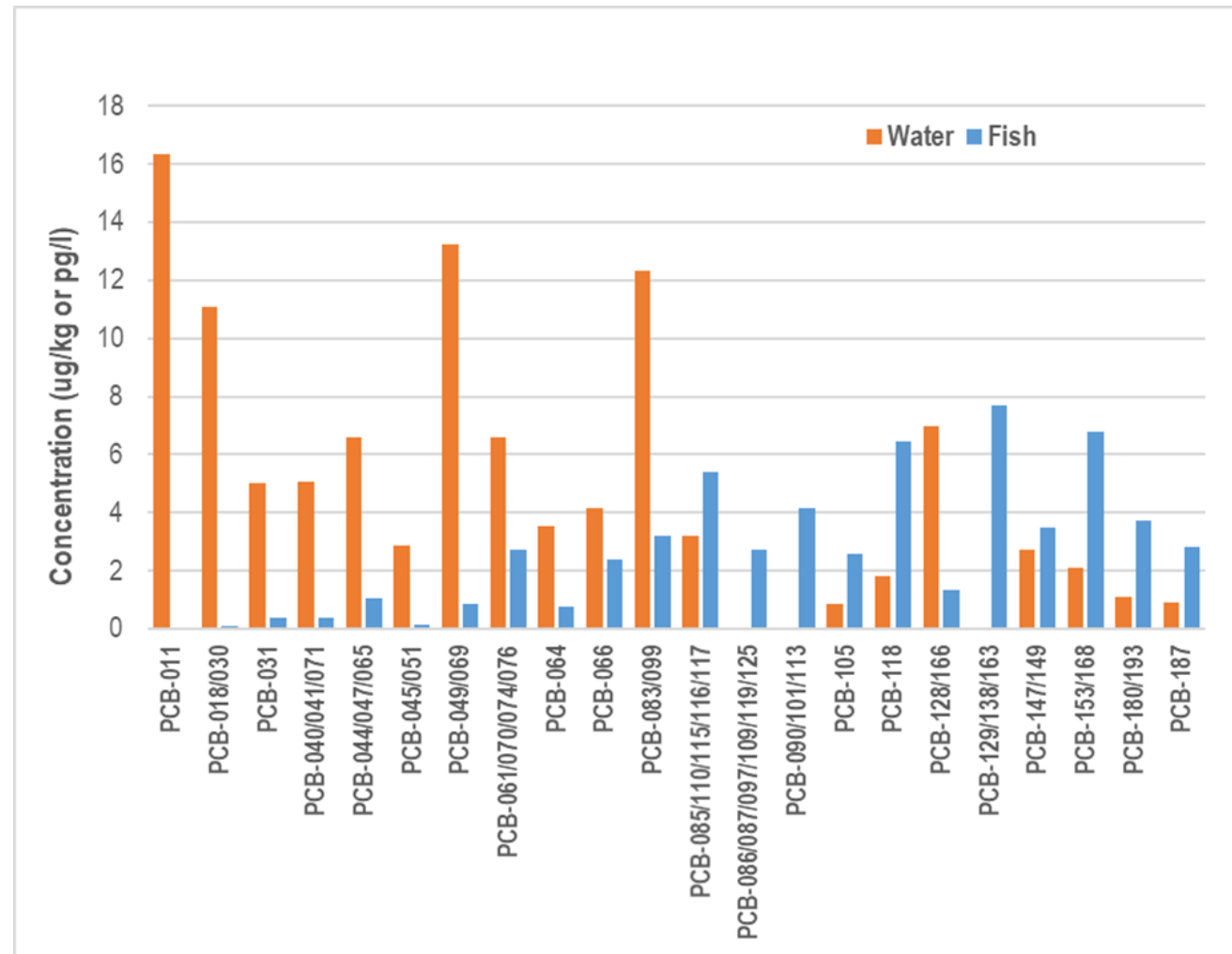
# How Do Allowable Product Levels Compare to What Is Allowed in the River?

- Washington State water quality standard for PCB = 0.00017 ppb
  - EPA proposed PCB criterion = 0.000007 ppb
- TSCA allows
  - 25 ppm (25,000 ppb) as an average, 125,000 ppb if primarily PCB-11
  - 50 ppm (50,000 ppb) as a maximum, 250,000 ppb if primarily PCB-11
- In the most optimistic case, product must be diluted **150,000,000x** in order to meet water quality standard
- In a more pessimistic case product, must be diluted **360,000,000,000x** to meet water quality standard



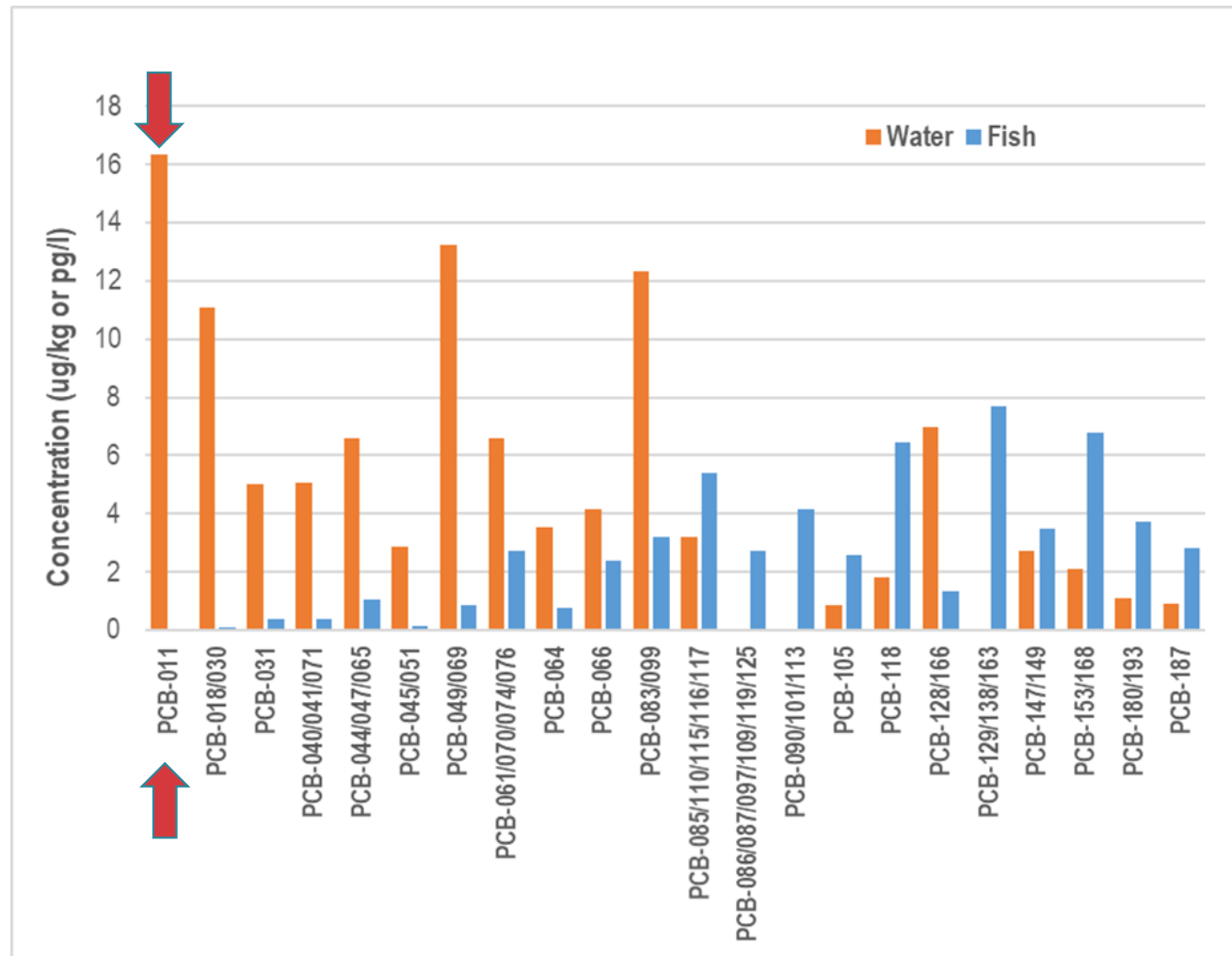
# How Much iPCB Are We Seeing in the River?

- Compiled all recent fish and water column PCB data to determine which congeners had the highest concentrations



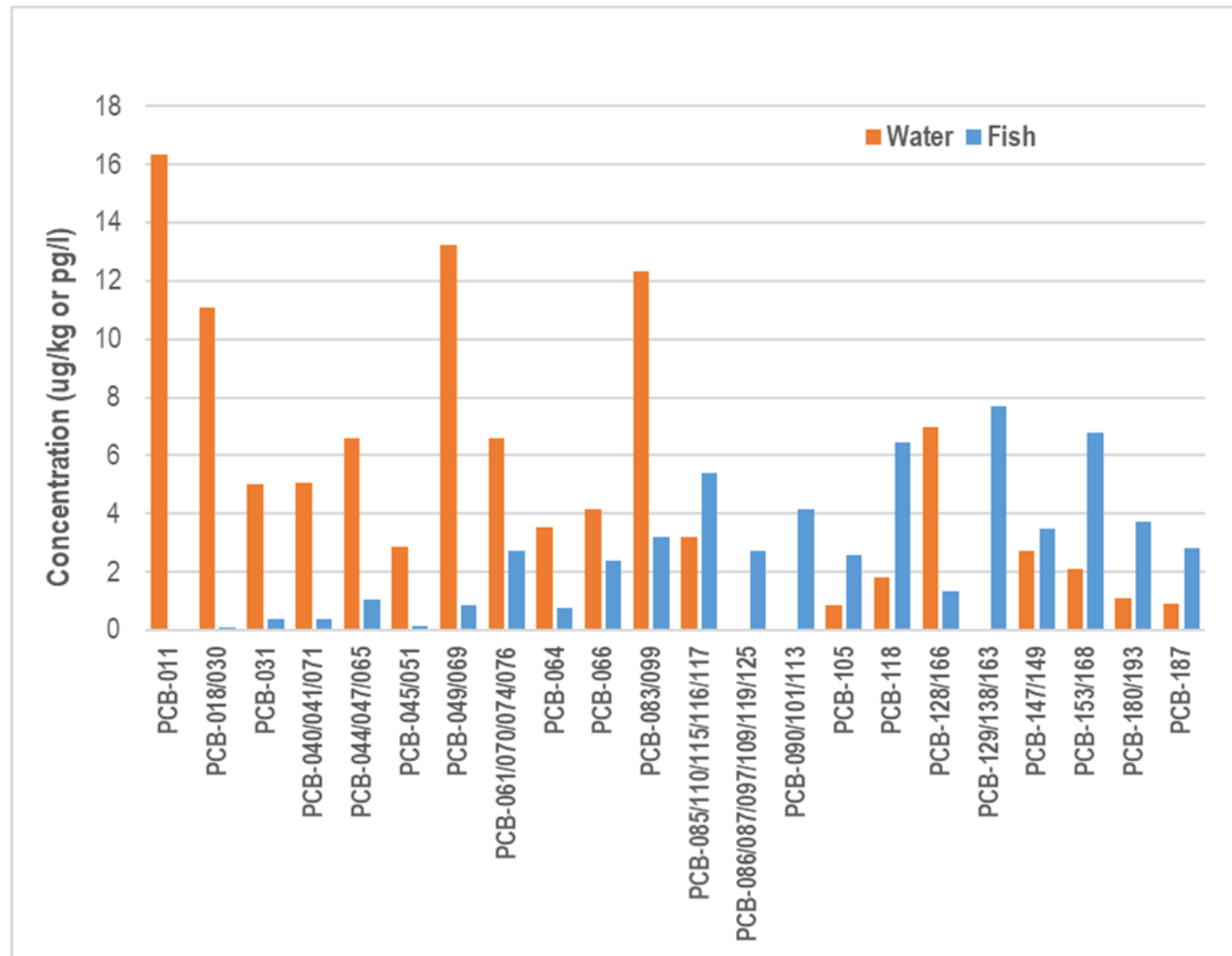
# How Much iPCB Are We Seeing in the River?

- PCB-11 is the most prevalent congener found in the water



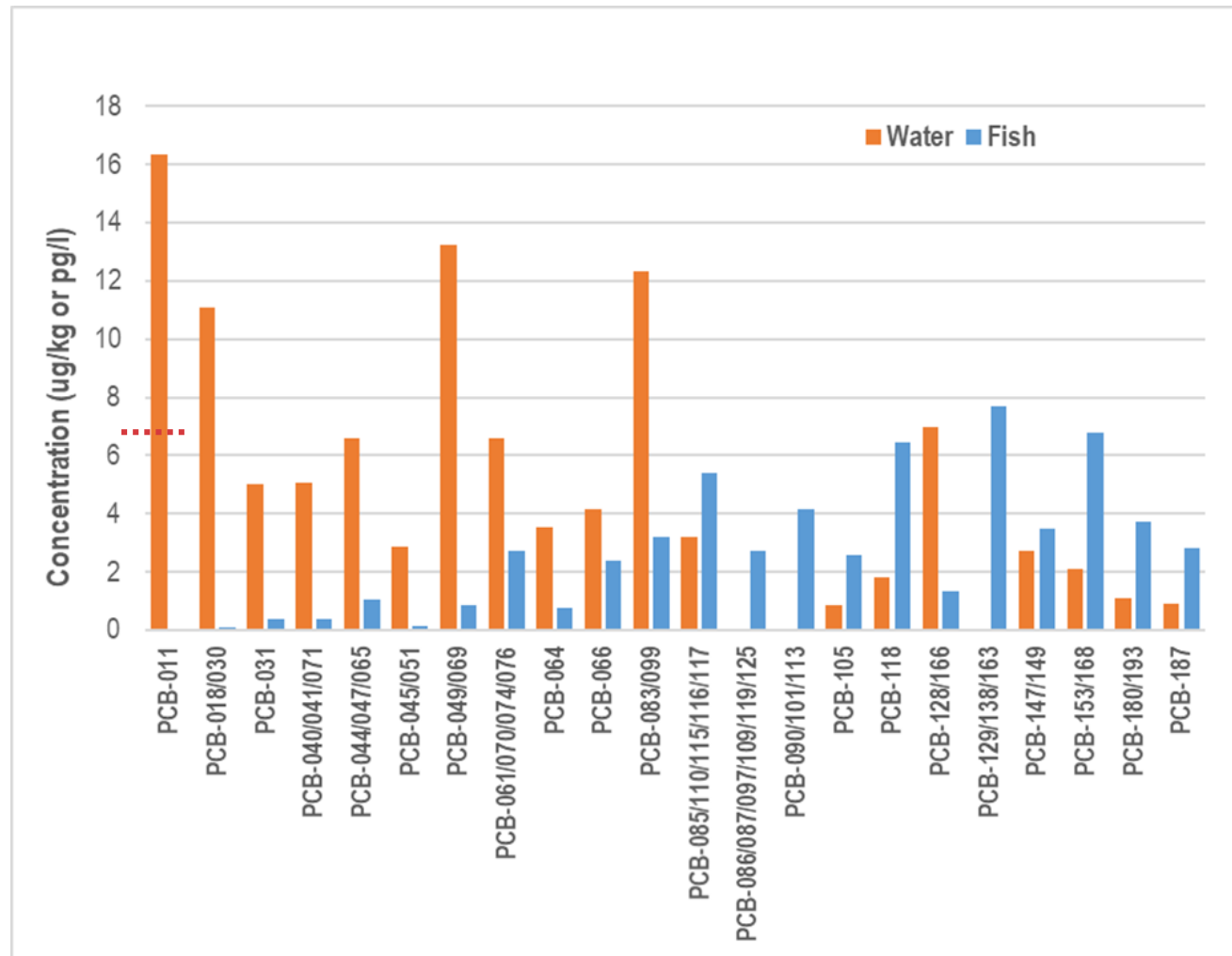
# How Much iPCB Are We Seeing in the River?

- PCB-11 is the most prevalent congener found in the water
  - Other congeners associated with inadvertent production not nearly as prevalent



# How Much iPCB Are We Seeing in the River?

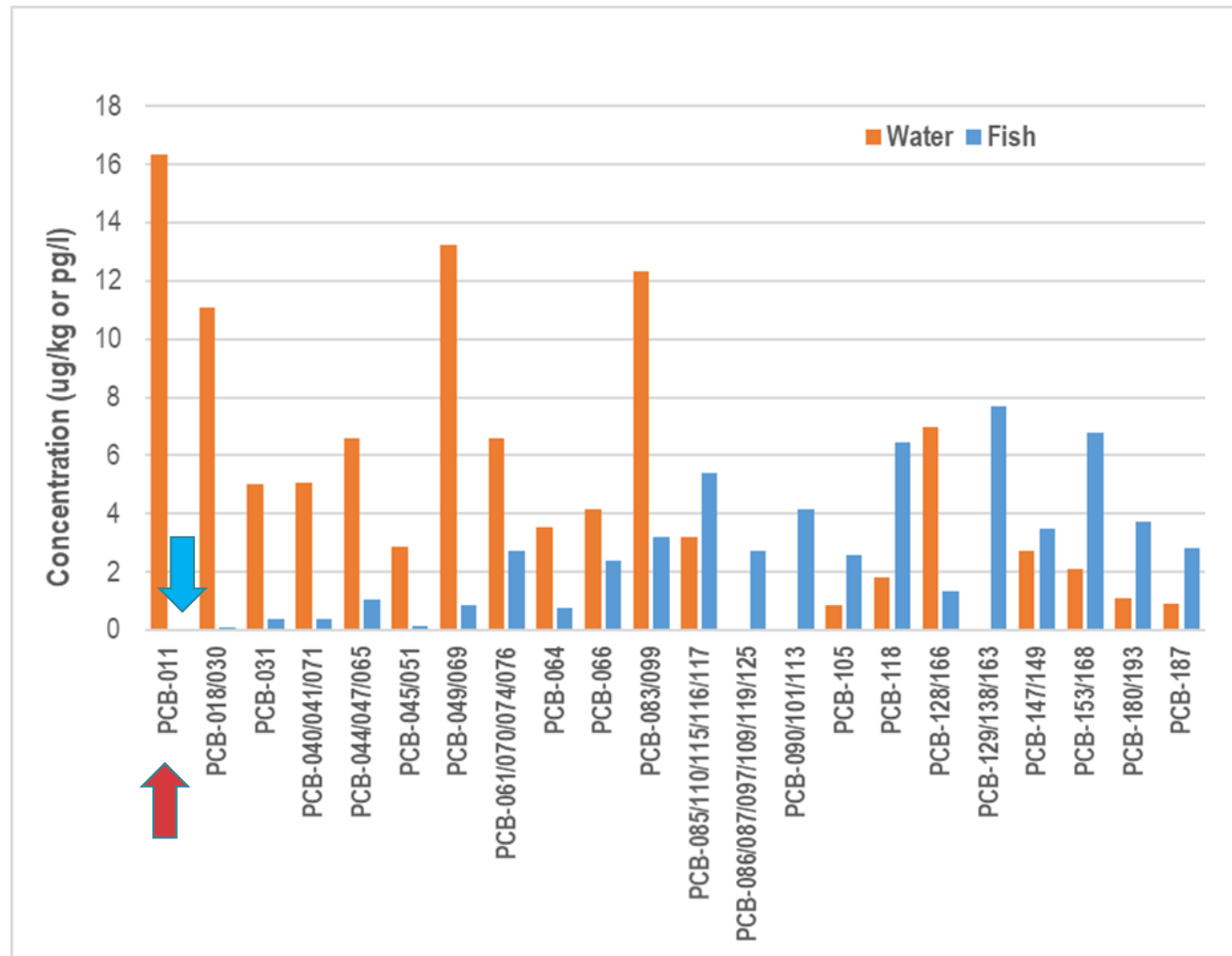
- PCB-11 concentrations alone exceed EPA criterion for *total* PCBs





# How Much iPCB Are We Seeing in the River?

- PCB-11 is largely absent from fish tissue



# Summary

- Many consumer products tested had detectable PCBs
  - None of these exceeded TSCA standards
  - PCB-11 was the dominant congener present
- Allowable levels of PCBs in products are 150 million to 360 billion times larger than allowable levels of PCBs in the water
- PCB-11 has the highest water column concentration of all PCB congeners
  - entering the river from the Spokane area
- PCB-11 concentrations alone exceed EPA criterion for *total* PCBs
- PCB-11 is not a large contributor to fish tissue PCB concentration



# Objective of Presentation

- Are iPCB concentrations exceeding allowable levels in consumer products?
  - No
- Are iPCB concentrations at problematic levels in the Spokane River?
  - Yes

