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Title of Effort	Fish Tissue BAF Correction Factor
Task Title	WEAP and MEPAS Module Enhancements
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Client	Engineer Research and Development Center (Waterways Experiment Station)
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Related PNNL Documents	

**The following change needs to be made to the User Interface for the MEPAS Exposure Component.
The change was requested by Mark Dortch of WES.**

Background

The estimation of contaminant concentrations in fish is based on bioaccumulation factors (BAFs) taken from the literature or estimated using correlation relationships. Often the data are based on measurement of contaminant concentrations in whole fish, as opposed to the concentration in edible fish tissue. The change described here is made to allow the user to define a correction factor to convert whole fish BAF values to fish-tissue BAF values.

UI Changes

The change involves adding one parameter to the MEPAS Exposure UI, allowing the user to define a correction factor for bioaccumulation factors based on fish tissue instead of whole fish. The correction will give the corresponding BCF based on edible fish tissue. The new parameter is only available to the user when surface water is selected and finfish ingestion has been selected. (A corresponding correction factor for shellfish ingestion is not provided at this time). The factor is presented to the user on the “Recreational” tab under the “Surface Water” tab. The new factor can be added to the bottom of the list with the current four items being:

- Finfish ingestion harvest delay time
- Shellfish ingestion harvest delay time
- Thickness of Shoreline sediments
- Density of shoreline sediments
- Finfish bioaccumulation correction factor.

The parameter name for appearance on the screen is EW-TISSUE (EWTISSUE for connection to the help screen) and is stored in the GID file as TISSUE. A default value of 1.0 is assigned to the position of EW-TISSUE on the screen when the screen is first opened, unless the user has previously defined a value and saved it to the GID file for the case.

Units: none
Range: 0.0001 to 9999.9

Formulation Changes

The change is implemented in the MEPAS exposure component by modifying the bioaccumulation factor used in the calculation of fish concentration. The previous version used the bioaccumulation factor directly from the database (or as estimated using correlation relationships when a value was not in the

database). The revised version modifies the value given in the database as follows:

$$BF_{fi} = B_{fi}TF_f$$

where BF_{fi} = bioaccumulation factor for fish tissue for pollutant i (mg/kg fish tissue per mg/L water)
 B_{fi} = bioaccumulation factor for whole fish for pollutant i (mg/kg whole fish per mg/L water)
 TF_f = fish tissue correction factor (mg/kg fish tissue per mg/kg whole fish)

The modified bioaccumulation factor is used to estimate the amount of contaminant in fish tissue ingested by individuals.

Note: this modification is only performed if the user provides a value for the tissue-correction factor in the MEPAS exposure component user interface. The default value for the tissue-correction factor is 1.0, which will result in no change to the bioaccumulation factor.