

How Water Quality can inform HEFR Parameters

A screenshot of the HEFR Inputs software interface. The window is titled "HEFR Inputs" and contains several sections for configuring parameters. The "Subsistence Flows" section has a radio button for "Subsistence Flows Threshold (%ile)" set to "0.5" and a text box for "Water Quality Protection Flow (cfs)". The "High Flow Pulses" section has a checkbox for "Multipeaks_Multiplier". The "Overbank Events" section has a checkbox for "Multipeaks_Multiplier" and a text box for "Estimate Of Bankfull (cfs)". The "Flow Recommendation Levels" section has radio buttons for "Low" (0.25), "Medium" (0.5), and "High" (0.75). The "HEFR Run Descriptive Information" section has text boxes for "USGS Gage ID", "Episodic Events Option" (set to "Percentile Approach"), "Season Type" (set to "Normal"), and "Start Month of First Season" (set to "December"). The "Define High Flow Pulses and Overbank Events by" section has checkboxes for "Peak Flow", "Volume", and "Duration". The "Intermittent Streams" section has a checkbox for "Calculate subsistence and base flow statistics based on non-zero flows only". The "IHA" section has text boxes for "IHA Projects Directory" and "Name of the IHA Analysis". At the bottom, there are buttons for "Check Inputs", "Run HEFR", "Exit HEFR", and "Help". A "Watch Window" section at the bottom is currently empty.

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Presentation at HEFR workshop
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SAC Guidance

“Nutrient and Water Quality Overlay for Hydrology-based Instream Flow Recommendations”

- Released November 3, 2009

Not specifically HEFR parameterization

Water Quality Protection Flow

If modeling suggests a minimum flow that is protective of water quality, enter that here.

7Q2 may be appropriate

The screenshot shows the 'HEFR Inputs' dialog box with the following sections and controls:

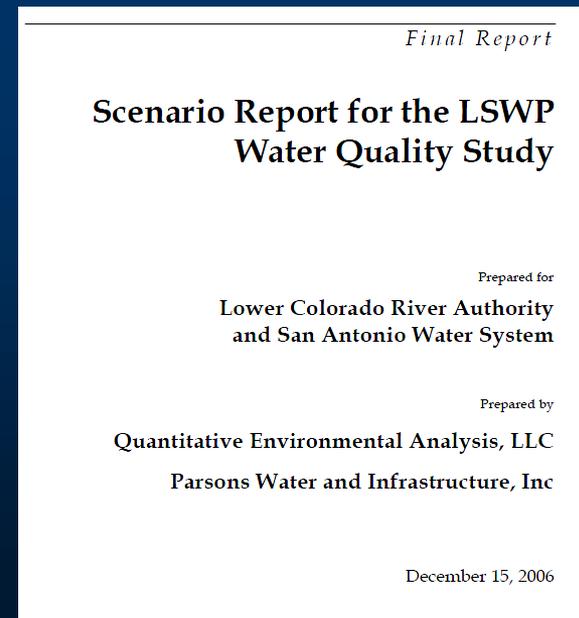
- Subsistence Flows:** Radio buttons for 'Subsistence Flows Threshold (%ile)' (set to 0.5) and 'Q95'. A text box for 'Water Quality Protection Flow (cfs)' is highlighted with a yellow oval.
- High Flow Pulses:** A checkbox for 'Multipeaks_Multiplier'.
- Overbank Events:** A checkbox for 'Multipeaks_Multiplier' and a text box for 'Estimate Of Bankfull (cfs)'.
- Flow Recommendation Levels:** Radio buttons for 'Low' (0.25), 'Medium' (0.5), and 'High' (0.75).
- HEFR Run Descriptive Information:** Text boxes for 'USGS Gage ID', 'Episodic Events Option' (set to 'Percentile Approach'), 'Season Type' (set to 'Normal'), and 'Start Month of First Season' (set to 'December').
- Define High Flow Pulses and Overbank Events by:** Checkboxes for 'Peak Flow', 'Volume', and 'Duration'.
- Intermittent Streams:** A checkbox for 'Calculate subsistence and base flow statistics based on non-zero flows only'.
- IHA:** Text boxes for 'IHA Projects Directory' and 'Name of the IHA Analysis'.
- Buttons:** 'Check Inputs', 'Run HEFR', 'Exit HEFR', and 'Help'.
- Watch Window:** A section for displaying information about various inputs and other status messages.

Existing Models and Reports

Review literature to find existing waste load allocation models, watershed protection plans, or other related efforts

Also examine 305(b) report and 303(d) list

www.tceq.state.tx.us/compliance/monitoring/water/quality/data/wqm/305_303.html



Water Quality Data

Perform a data analysis and try to find flows at which water quality standards are often not met.

- Surface Water Quality Monitoring Program
- Clean Rivers Program
- USGS
- Special Studies

Water Quality Data Analysis

What we are looking for

What we usually find

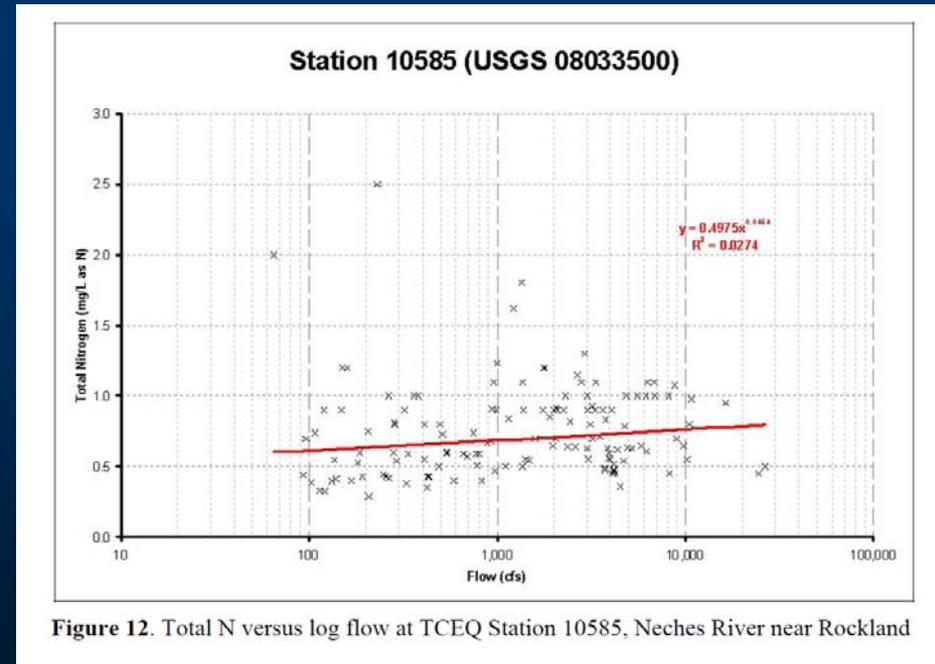
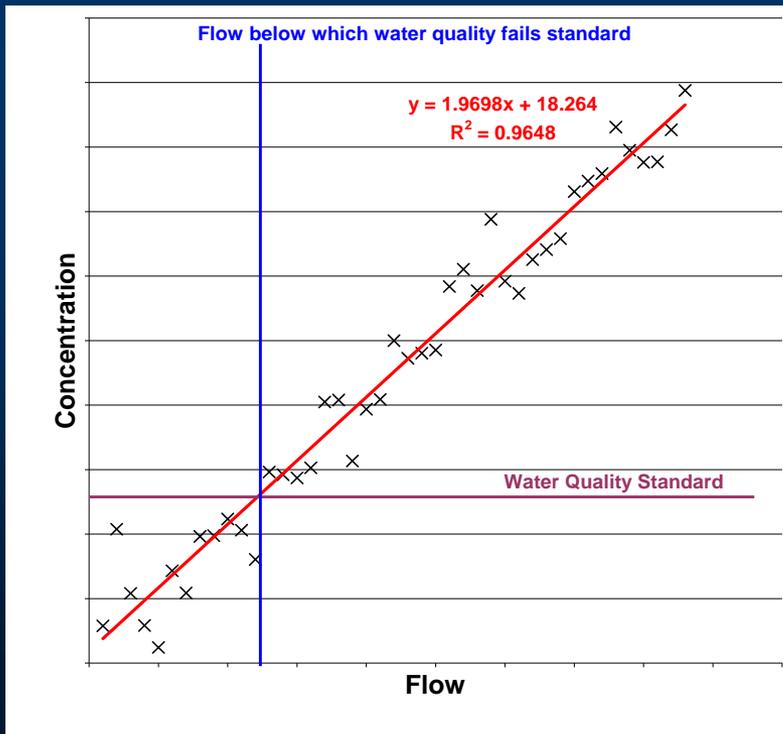


Figure 12. Total N versus log flow at TCEQ Station 10585, Neches River near Rockland

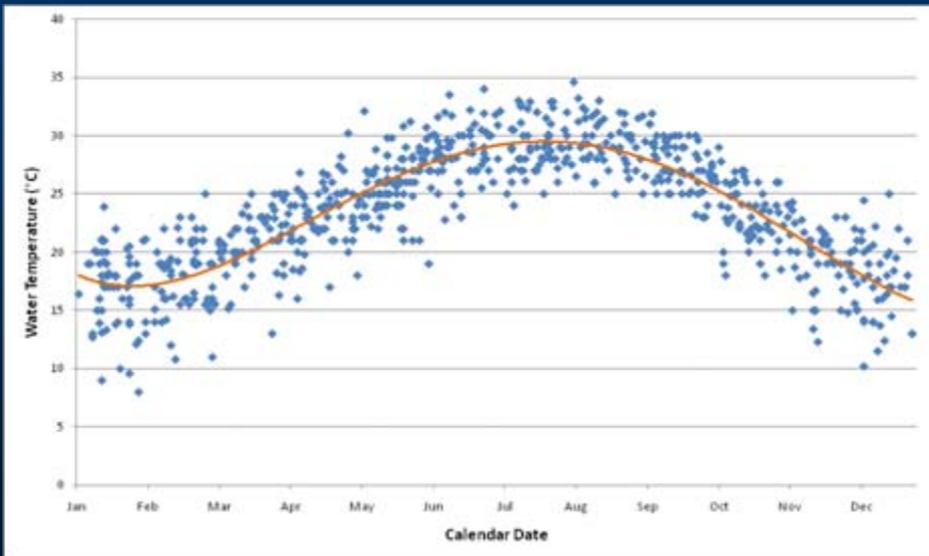
Considerations

Data may be limited in range of subsistence flows

Even if a strong relationship is not found, this may be helpful to provide confidence in subsistence flow values from a water quality perspective

Seasonality

Temperature data can be used to identify appropriate seasonality



The screenshot shows the 'HEFR Inputs' dialog box. In the 'HEFR Run Descriptive Information' section, the 'Season Type' dropdown is set to 'Custom' and the 'Start Month of First Season' dropdown is set to 'December'. A yellow arrow points from these settings to the 'Assign HEFR Seasons' dialog box.

The screenshot shows the 'Assign HEFR Seasons' dialog box. It has a dropdown for 'How many seasons do you wish to have for this analysis?' set to 4, and a dropdown for 'Which month is the beginning of the first season for this analysis?' set to December. Below is a table of season definitions:

Name of Season	Start Month	End Month
Winter	December	February
Spring	March	May
Summer	June	August
Fall	September	November

Buttons for 'Start Over' and 'Done with Season Chooser' are at the bottom.