Model Development Steps

1. Data collection
2. Data input
3. Assemble and run analysis plans
4. Review initial data output
5. Calibration / Validation
6. Use final data output for assessment, alternatives analysis, design, or verification
Assemble and Run Analysis Plans

Plan Selection

- Plan Geometry and Results Comparison
  - Compare Geometry as well as Output (can only select current plan + one more)
  - Note: Geometry comparison only works for cross section and profile plots

Select Plans (current plan = Existing Conditions)

- Existing Conditions (Short ID = MMI EX, Geom = Existing Conditions)
- Proposed Conditions: Full Removal (Short ID = Prop Cond- Full, Geom)
- PropCond- Left Spillway Removal (Short ID = Prop-Leftspill, Geom)
- PropCond- Partial Left Spillway Removal (Short ID = Prop-Part-Lspill, Geom)
- PropCond- Left Spillway Removal V2 (Short ID = Left_V2, Geom)
- PropCond- Left Spillway Removal V3 (Short ID = Part-LeftV3, Geom)

Legend

- WS HP: MMEX
- WS HP: Part-Left V2
- Ground
- Ground

Wells River Plan: 1) MMI EX 2) Part-Left V3

Main Channel Distance (ft) vs. Elevation (ft) Graph
Running the model under subcritical flow (the default) when the site has mixed flow conditions. Most rivers have mixed flow conditions.
Ineffective Flow

HB_2008_Permitt Plan: 2008 Harbor Brook Existing Conditions

Legend
- WS 100-yr
- Ground
- Ineff
- Bank Sta.

Station (ft)
Elevation (ft)

HB_2008_Permitt Plan: 2008 Harbor Brook Existing Conditions

Legend
- WS 100-yr
- Ground
- Ineff
- Bank Sta.

Station (ft)
Elevation (ft)
Review Initial Data Output

- Look at graphical and tabular data
- Relate output with intuition and previous knowledge of site
- Look for large fluctuations in profile, depth, and velocity
- Consider where the flow is sub- or super-critical
**Calibration / Validation**

**Calibration**
- Requires known design flow rate (prefer known range of flows)
- Requires known high water marks, water surface profiles, or velocities
- Review input and adjust model coefficients to fit known data
- Confirm realistic coefficients following calibration

**Validation**
- Ideally performed after model calibration
- Test calibrated model results with known data
- Validate first at most important flow and then over a range of flows
- Requires a second set of measured data
- In practice often performed in conjunction with calibration due to lack of data
Calibration / Validation
Calibration / Validation

2-3 feet aggradation upstream of bridge observed during Irene
Calibration / Validation

4/27/2011 flood
Final Output

• What is the best alternative based on hydraulic modeling alone?
• Is hydraulic preferred alternative = to project preferred alternative?
• Compare final results, flood data, and un-validated results to confirm findings make sense
• Expand analysis to other hydraulic parameters such as shear and power
• Consider new alternatives as needed