

HECRAS Other Features (2)

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Other Features of HEC-RAS- part 2

- Cross Section Interpolation
- Multiple Plans
- Supporting Pictures



Cross Section Interpolation



Cross Section Interpolation

- Sometimes it is necessary to supplement surveyed cross section data by interpolating new sections between two surveyed sections
- Typically needed when the change in velocity head is large. HECRAS detects this by comparing conveyance values between two sections.



Cross Section Interpolation

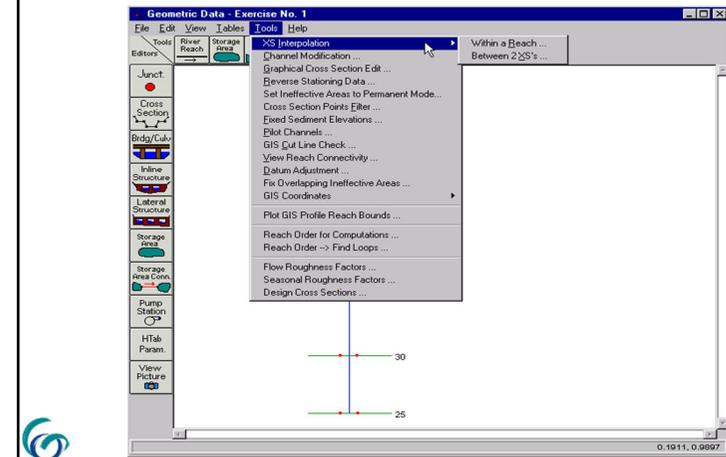
Geometric interpolation is accomplished by linearly interpolating between elevations and stations along “cords”

2 Options -

- Interpolate a reach (more than 2 cross-sections)
- Between 2 cross-sections



Cross Section Interpolation

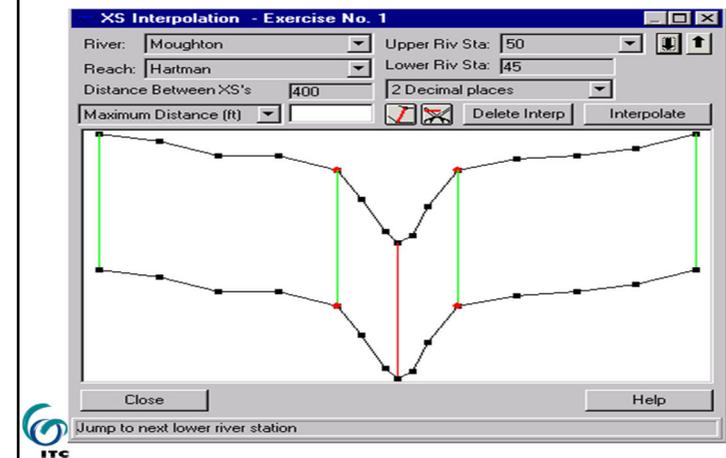


Cross Section Interpolation Master Cords - 5 Defaults

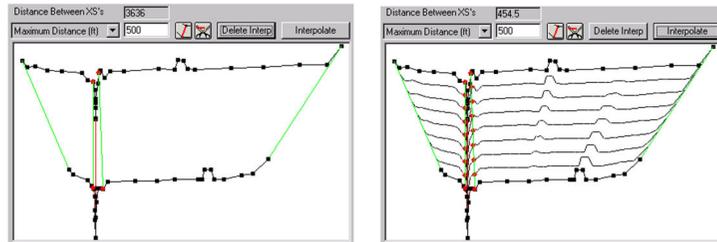
1. First coordinate of cross section
2. Left bank (required)
3. Minimum elevation point in main channel
4. Right bank (required)
5. Last coordinate of cross section



Cross Section Interpolation Master Cords



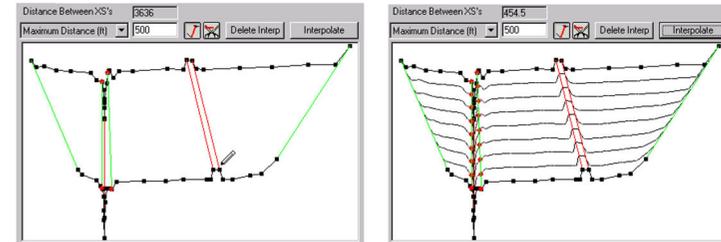
Be Aware Of What The “Default” Is Doing



- User can establish more Master Chords to prevent mis-interpolations



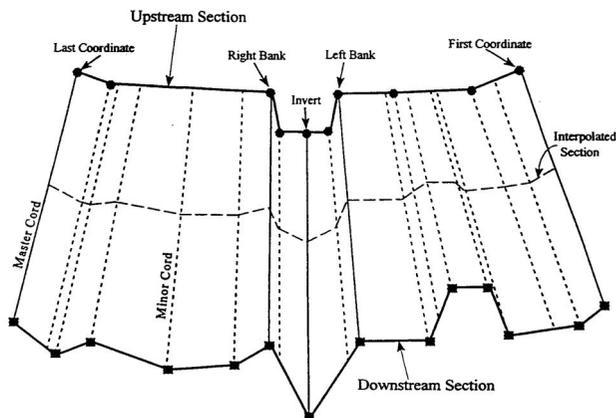
Adding Master Chords to Interpolation



An adequate interpolation adding master chords



Cross Section Interpolation: Minor Cords



Cross Section Interpolation: Minor Cords

- Automatically generated by program
- Stations are determined using proportional distances between master cords
- Number of minor cords = sum of coordinates in bounding cross sections minus number of master cords



Cross Section Interpolation: Roughness Coefficients

- 4 default master cords (same as geometric minus the minimum channel elevation)
- Minor cords added at other locations if more than 3 'n' values at either cross sect.
- Otherwise same as geometric interpolation



Cross Section Interpolation: Other

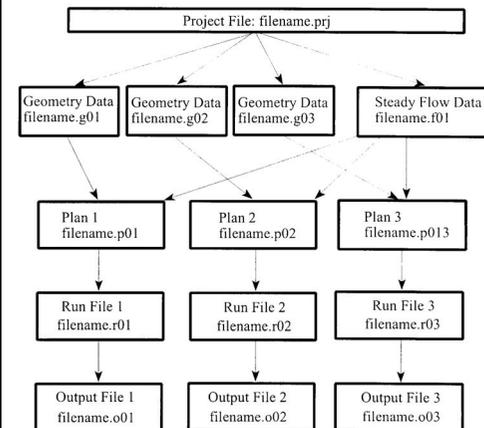
- Other features which are interpolated: downstream reach lengths, main channel bank stations, contraction and expansion coefficients, normal ineffective flow areas, levees, and normal blocked obstructions
- Normal ineffective flow areas, levees, and normal blocked obstructions are interpolated only if both bounding cross sections have them.
- Can interpolate between 2 cross sections or entire reach



Multiple Plans



HEC-RAS - Multiple Plans



Suggested Reading:
Chapter 5 of HEC-RAS
User's Manual

Figure 5.1 Schematic of Project Data Files.

HEC-RAS - Multiple Plans

Able to compare plans in tables:

Reach	River Sta	Profile	Plan	Q Total (cfs)	W/S Elev (ft)	E.G. Elev (ft)	Vel Chnl (ft/s)	Top Width (ft)	Max Chl Dpth (ft)	Froude #	Chl #
Hartman	60	PF 1	Ex. No. 4	1000	117.7	119.0	9.01	67	2.7	1.23	
Hartman	60	PF 1	Exercise 5	1000	117.7	119.0	9.01	67	2.7	1.23	
Hartman	55	PF 1	Ex. No. 4	1000	102.7	104.0	9.01	67	2.7	1.23	
Hartman	55	PF 1	Exercise 5	1000	102.7	104.0	9.01	67	2.7	1.23	
Hartman	50	PF 1	Ex. No. 4	1000	89.5	89.8	3.90	94	4.5	0.42	
Hartman	50	PF 1	Exercise 5	1000	89.6	89.8	3.87	94	4.6	0.41	
Hartman	45	PF 1	Ex. No. 4	1000	88.8	88.9	3.00	107	5.3	0.30	
Hartman	45	PF 1	Exercise 5	1000	88.9	89.0	2.95	108	5.4	0.29	
Hartman	40	PF 1	Ex. No. 4	1000	88.5	88.6	2.42	120	6.0	0.23	
Hartman	40	PF 1	Exercise 5	1000	88.6	88.7	2.37	121	6.1	0.22	
Hartman	39	PF 1	Ex. No. 4	1000	88.0	88.1	2.40	121	6.0	0.23	
Hartman	39	PF 1	Exercise 5	1000	88.1	88.2	2.34	123	6.1	0.22	
Hartman	38	PF 1	Ex. No. 4	1000	87.8	87.9	2.46	119	5.9	0.24	
Hartman	38	PF 1	Exercise 5	1000	87.9	88.0	1.94	263	6.0	0.24	



HEC-RAS - Multiple Plans

Able to compare plans in tables:

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 = proposed)

- proposed (Short ID = proposed, Geom = proposed geom)
- existing (Short ID = existing, Geom = existing)

Select All Clear All OK Cancel



HEC-RAS - Multiple Plans

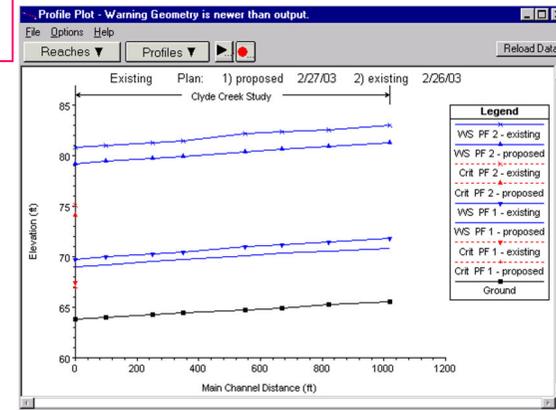
Able to compare plans in tables:

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HEC-RAS - Multiple Plans

As well as in profiles, cross-sections, etc.:



Supporting Pictures



Supporting Pictures

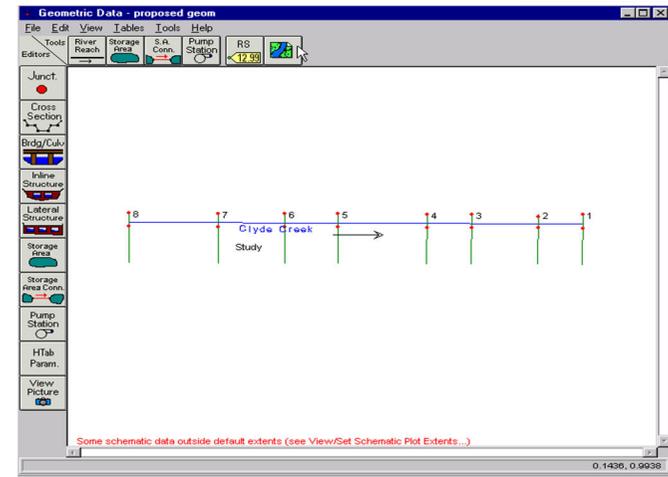
- A picture can be “attached” to a cross section to help in documentation of the data.
- A picture can also be “attached” to the river schematic to assist in documentation.



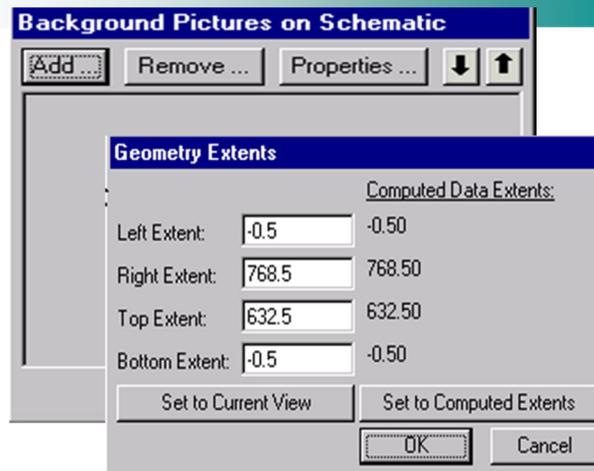
Example - Cross-Section



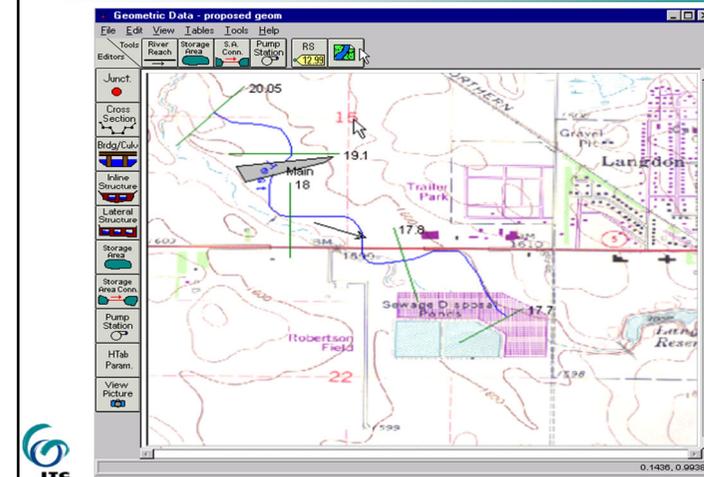
Example - River Schematic



Example - River Schematic



Example - River Schematic



Log Files

- Program will write notes to a file as it performs the computations.
- 10 different levels of output.
- Files can get extremely large if higher levels are selected.
- Generally not necessary unless unusual answers are given by the program.



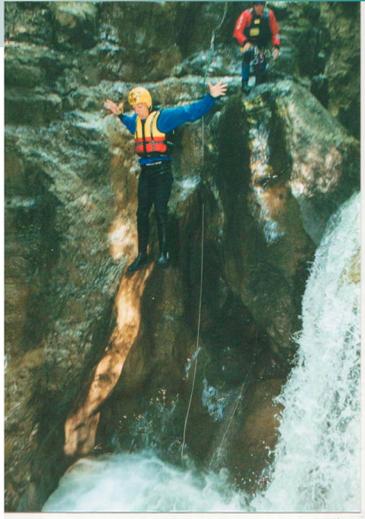
Other Options

There are other options not discussed in this presentation:

- Scour at bridges
- Lateral weirs
- Ice-covered rivers
- Cross-Section points filter
- Fixed sediment elevations
- Pilot channels
- Setting ineffective flow areas to permanent



Any
Questions?



End of lecture

