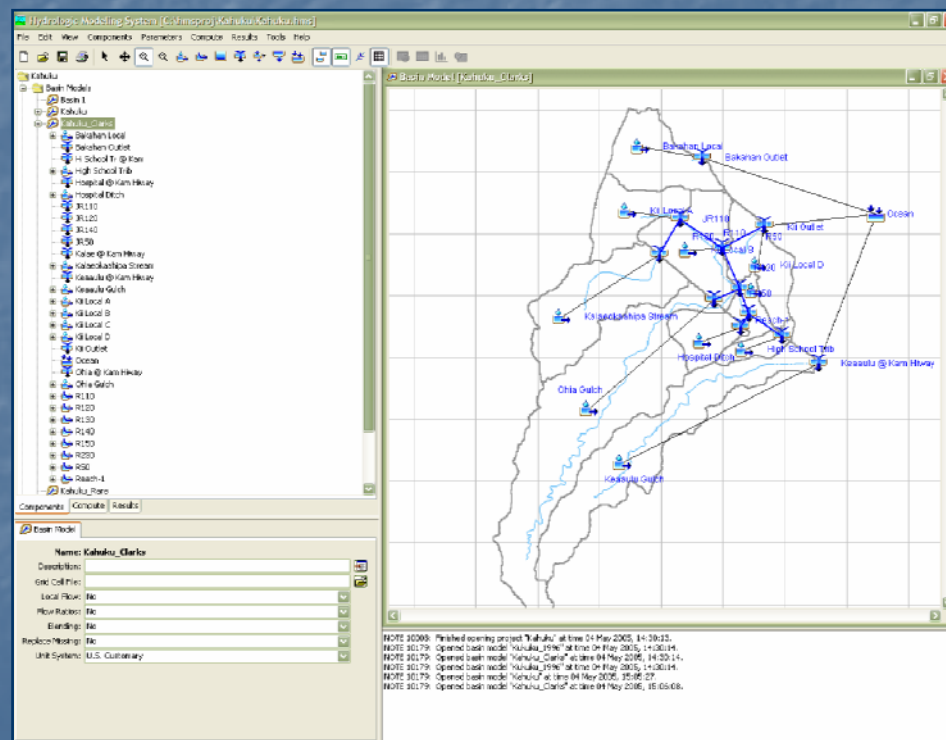
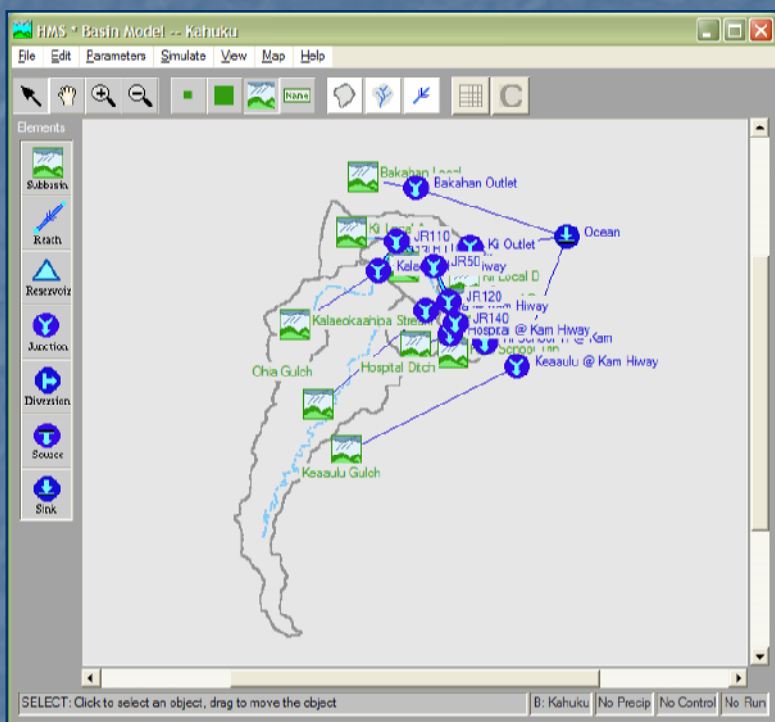


Hydrologic Engineering Center

HEC-HMS

Version 3.0

New Features



US Army Corps of Engineers
Hydrologic Engineering Center

2005 Tri-Services Infrastructure Conference, St. Louis

Topics

- HEC-HMS
 - Version 3.0
 - Concepts
 - Data Components
 - Simulation
 - Results

HEC-HMS Version 3.0

- **Initial Release**
 - New User Interface - JAVA
 - Snow Accumulation and Melt
 - Depth-Area Storm Event Analysis
 - Evapotranspiration
- **Under Development**
 - Interior Flooding Capabilities
 - Land Surface Wash-off

New User Interface - JAVA

- **Finished Java Conversion**
 - Converted Entire Existing Engine with Data Model and Simulation Components from C++, Galaxy to Java
 - Scraped Old Interface in Favor of New Design
 - Easy to Learn
 - More Flexible for Configuring Data and Viewing Results
 - Faster to Use Because it Anticipates User Needs
 - Similar in Layout to Other Engineering Software
 - New Interface Design Complete
- **Beta Testing in Progress**
 - Approximately 60 testers
 - Several International
 - Testing Complete August 26th

HMS Provides

- Tool kit of options
 - Basin Parameters
 - Parameter estimation (optimization)
- Graphical user interface
 - Select-and-add icons
 - Graphical and tabular displays
- Multiple operating system support
 - Windows, UNIX

HMS Version 3.0

Watershed Explorer

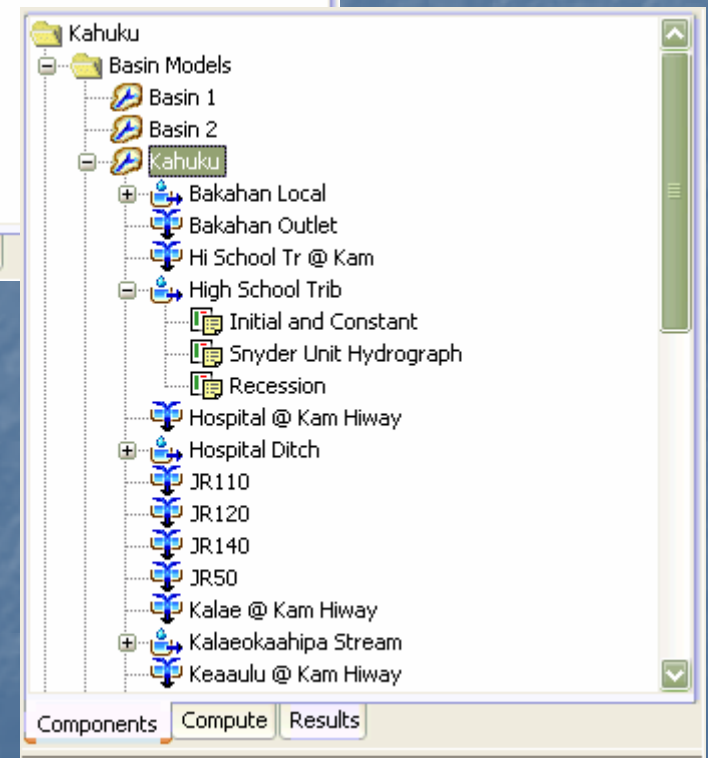
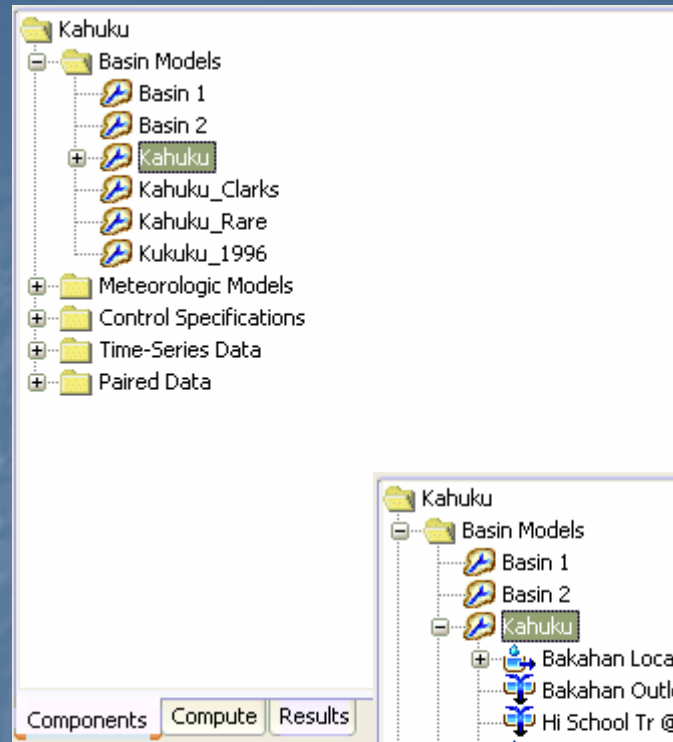
Basin Map

Component Editor

Message Pane

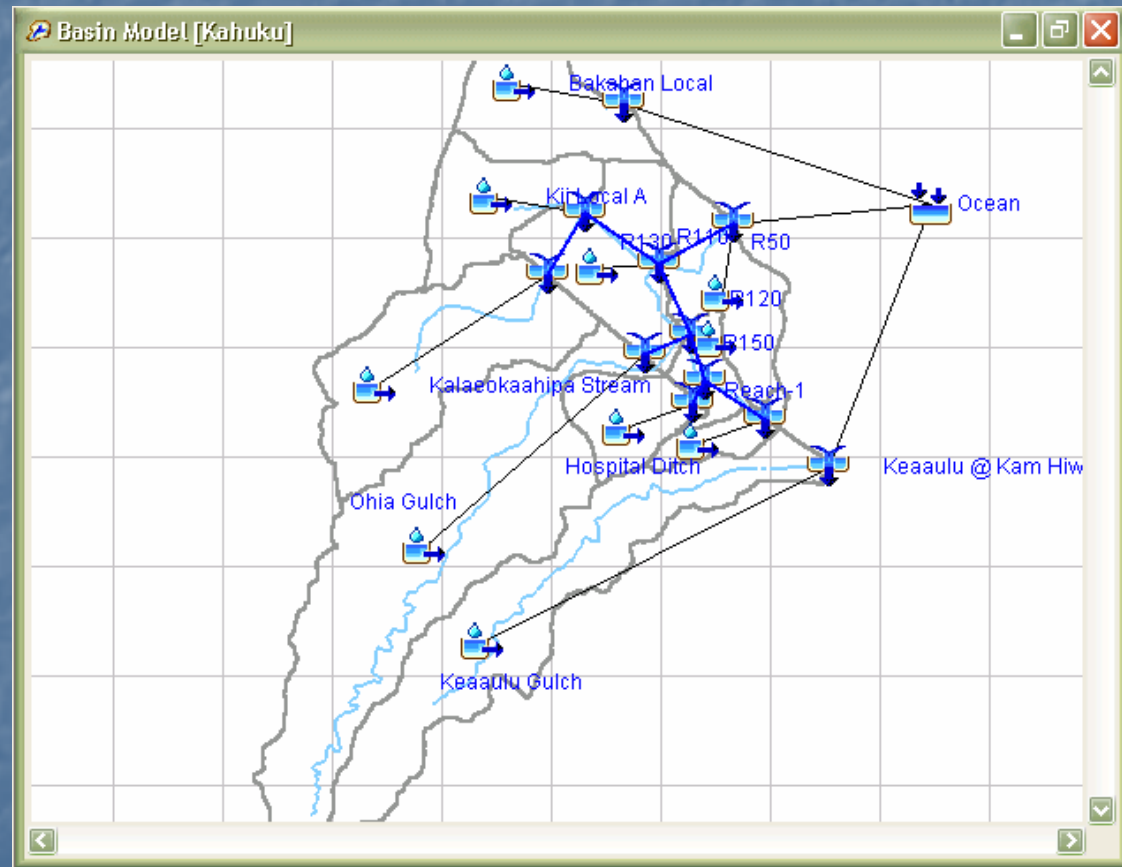
Watershed Explorer

- List All Project Components
- Expand Multiple Components
- List All Elements
- Icon Shows Element Type
- Direct Access to Methods
- Selected Element Highlighted on Map
- Right Click Menu



Basin Map

- Georeferenced
- Shows all elements
- Make any Element Active
- Zoom In and Out
- Right Click Menu
- View Results



Component Editor

- Editors for all Elements
- Automatically Reflects Selected Element

The screenshot shows a software dialog box titled "Component Editor" with three tabs: "Reach", "Route", and "Options". The "Reach" tab is active. The dialog contains the following fields and controls:

- Name:** R110
- Description:** An empty text input field.
- Downstream:** A dropdown menu with "JR50" selected.
- Method:** A dropdown menu with "Muskingum-Cunge" selected.
- Method List:** A scrollable list box containing the following options: "--None--", "Kinematic Wave", "Lag", "Modified Puls", "Muskingum", "Muskingum-Cunge" (highlighted in green), and "Straddle Stagger".

On the right side of the dialog, there are two small icons: a document with a red 'X' and a document with a blue 'A'.

Message Pane

- Instant Feedback
- Lists errors
- Tracks Current Execution

```
NOTE 10008: Finished opening project "Kahuku" at time 06 May 2005, 19:41:36.  
NOTE 10179: Opened basin model "Kukuku_1996" at time 06 May 2005, 19:41:36.  
NOTE 10179: Opened basin model "Kahuku_Clarks" at time 06 May 2005, 19:41:36.  
NOTE 10179: Opened basin model "Kukuku_1996" at time 06 May 2005, 19:41:36.  
NOTE 10179: Opened basin model "Kahuku" at time 06 May 2005, 19:43:16.
```

HEC-HMS Project

- Container for components
 - Basin model
 - Gage and paired data
 - Gridded data
 - Meteorologic model
 - Control specifications
- Analysis methods
 - Simulation
 - Parameter estimation (optimization)
 - Depth-Area

Hydrologic Modeling System [C:\hmsproj\Kahuku\Kahuku.hms]

File Edit View Components Parameters Compute Results Tools Help

Kahuku

- Basin Models
 - Basin 1
 - Basin 2
 - Kahuku
 - Kahuku_Clarks
 - Kahuku_Rare
 - Kuku_1996
- Meteorologic Models
- Control Specifications
- Time-Series Data
- Paired Data

Basin Model Manager

Current basin models

- Basin 1
- Basin 2
- Kahuku
- Kahuku_Clarks
- Kahuku_Rare
- Kuku_1996

New... Copy... Rename... Delete

Basin Model

Name: Kahuku

Description: Basin model created with HEC-GeoHMS v1.1 Beta

Grid Cell File:

Local Flow: No

Flow Ratios: No

Blending: No

Replace Missing: No

Unit System: U.S. Customary

NOTE 10008: Finished opening project "Kahuku" at time 06 May 2005, 10:23:40.
NOTE 10179: Opened basin model "Kuku_1996" at time 06 May 2005, 10:23:41.
NOTE 10179: Opened basin model "Kahuku_Clarks" at time 06 May 2005, 10:23:41.
NOTE 10179: Opened basin model "Kuku_1996" at time 06 May 2005, 10:23:41.
NOTE 10179: Opened basin model "Kahuku" at time 06 May 2005, 10:24:53.
NOTE 10180: Opened meteorologic model "100-Year" at time 06 May 2005, 10:29:05.
NOTE 10181: Opened control specifications "Nov 1996" at time 06 May 2005, 10:47:28.

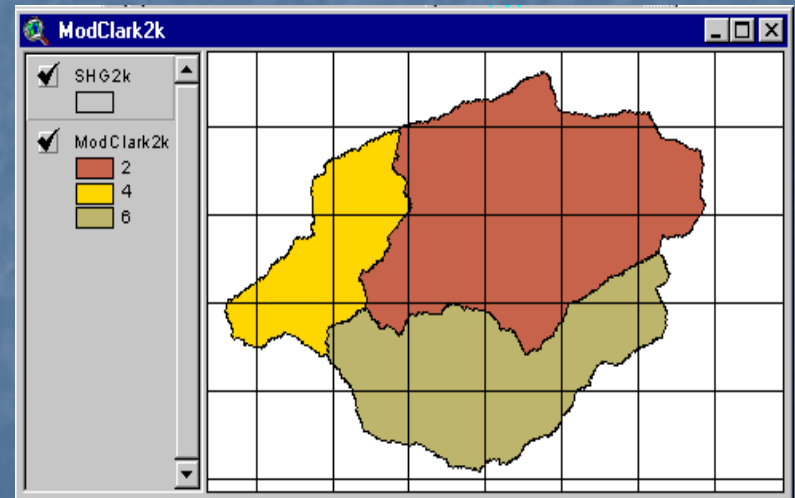
Basin Models

The screenshot displays the Hydrologic Modeling System (HMS) software interface. The main window shows a map of a basin model with various components labeled, including 'Bakahan Local', 'Kil Local A', 'JR110', 'R130', 'R110', 'R50', 'Kil Outlet', 'Ocean', 'Kil Local B', 'R20', 'Kil Local D', 'Reach 1', 'Hiram School Trib', 'tch', and 'Keaaulu @ Kam Hiw'. A 'Basin Model Manager' dialog box is open, listing current basin models: Basin 1, Basin 2, Kahuku, Kahuku_Clarks, Kahuku_Rare, and Kukuku_1996. Below the list are buttons for 'New...', 'Copy...', 'Rename...', and 'Delete'. A 'Create A New Basin Model' dialog box is also open, with 'Name' set to 'Basin 3' and a 'Description' field. The interface includes a menu bar (File, Edit, View, Components, Parameters, Compute, Results, Tools, Help) and a toolbar. A log window at the bottom shows the following messages:








```
NOTE 10008: Finished opening project "Kahuku" at time 05 May 2005, 15:35:24.  
NOTE 10179: Opened basin model "Kukuku_1996" at time 05 May 2005, 15:35:25.  
NOTE 10179: Opened basin model "Kahuku_Clarks" at time 05 May 2005, 15:35:25.  
NOTE 10179: Opened basin model "Kukuku_1996" at time 05 May 2005, 15:35:25.  
NOTE 10179: Opened basin model "Kahuku" at time 05 May 2005, 15:41:31.
```

Basin Model Types

- Area Averaged
 - Parameters apply to entire subbasin
- Gridded (GeoHMS)
 - ModClark Transform
 - Gridded Precip
 - HRAP, SHG
 - Grid Cell File



Basin Model Elements

-  Subbasin - *Watershed Catchments*
-  Reach - *Rivers and Streams*
-  Reservoir - *Dams and Lakes*
-  Junction - *Confluence*
-  Diversion - *Bifurcations and Withdrawals*
-  Source - *Springs and other Model Sinks*
-  Sink - *Outlets and Terminal Lakes*

Subbasin Element Loss Parameter

Loss Methods

- Initial and Constant
- Deficit and Constant
- Evapotranspiration
- Green and Ampt
- Gridded Deficit Constant
- Gridded SCS Curve Number
- Gridded SMA
- SCS Curve Number
- Soil Moisture Accounting

The screenshot displays the Hydrologic Modeling System (HMS) interface. The main window shows a map of the 'Kahuku' basin with various subbasins and elements. The 'Loss' parameter settings for the 'Bakehan Local' subbasin are shown in the bottom panel:

Name: Bakehan Local	
Initial Loss (I ₀)	0.700
Constant Rate (I ₀ /HR)	0.700
Impervious (%)	0.0

The interface also shows a list of elements in the left pane, including 'Bakehan Local', 'Bakehan Outlet', 'High School Tr @ Kam', 'Hospital @ Kam Hiway', 'Hospital Ditch', 'JR110', 'JR120', 'JR140', 'JR50', 'Kalee @ Kam Hiway', 'Kaleokashipa Stream', 'Keasulu @ Kam Hiway', 'Keasulu Gulch', 'Ki Local A', 'Ki Local B', 'Ki Local C', 'Ki Local D', 'Ki Outlet', 'Ocean', 'Ohia @ Kam Hiway', 'Ohia Gulch', 'R110', 'R120', 'R130', 'R140', 'R150', 'R230', 'R50', 'Rasch-1', and 'Kahuku_Clarks'.

Subbasin Element

■ Editor

The screenshot displays the Hydrologic Modeling System (HMS) interface. The main window shows a map of the watershed with various subbasins and reaches. A context menu is open over the 'Bakahan Local' subbasin, listing options: Loss, Transform, Baseflow, Routing, Subbasin Methods, Reach Method..., and Element Inventory. The 'Subbasin' tab is selected in the editor, showing the following configuration:

Name: Bakahan Local
Description: [Empty field]
Downstream: Bakahan Outlet
Area (MI2): 0.581000
Loss Method: Initial and Constant
Transform Method: Snyder Unit Hydrograph
Baseflow Method: Recession

The 'Baseflow' tab is also visible, showing the following parameters:

Parameter	Value
Initial Discharge (CFS/MI2)	1.00
Recession Constant	1.00
Threshold Type	Threshold Discharge
Threshold Flow (CFS)	1

The map shows the watershed boundary and various subbasins, including 'Bakahan Local', 'Kilauea A', 'JR110', 'Kilauea B', 'Kilauea C', 'Kilauea D', 'Kilauea E', 'Kilauea F', 'Kilauea G', 'Kilauea H', 'Kilauea I', 'Kilauea J', 'Kilauea K', 'Kilauea L', 'Kilauea M', 'Kilauea N', 'Kilauea O', 'Kilauea P', 'Kilauea Q', 'Kilauea R', 'Kilauea S', 'Kilauea T', 'Kilauea U', 'Kilauea V', 'Kilauea W', 'Kilauea X', 'Kilauea Y', 'Kilauea Z', 'Kilauea AA', 'Kilauea AB', 'Kilauea AC', 'Kilauea AD', 'Kilauea AE', 'Kilauea AF', 'Kilauea AG', 'Kilauea AH', 'Kilauea AI', 'Kilauea AJ', 'Kilauea AK', 'Kilauea AL', 'Kilauea AM', 'Kilauea AN', 'Kilauea AO', 'Kilauea AP', 'Kilauea AQ', 'Kilauea AR', 'Kilauea AS', 'Kilauea AT', 'Kilauea AU', 'Kilauea AV', 'Kilauea AW', 'Kilauea AX', 'Kilauea AY', 'Kilauea AZ', 'Kilauea BA', 'Kilauea BB', 'Kilauea BC', 'Kilauea BD', 'Kilauea BE', 'Kilauea BF', 'Kilauea BG', 'Kilauea BH', 'Kilauea BI', 'Kilauea BJ', 'Kilauea BK', 'Kilauea BL', 'Kilauea BM', 'Kilauea BN', 'Kilauea BO', 'Kilauea BP', 'Kilauea BQ', 'Kilauea BR', 'Kilauea BS', 'Kilauea BT', 'Kilauea BU', 'Kilauea BV', 'Kilauea BW', 'Kilauea BX', 'Kilauea BY', 'Kilauea BZ', 'Kilauea CA', 'Kilauea CB', 'Kilauea CC', 'Kilauea CD', 'Kilauea CE', 'Kilauea CF', 'Kilauea CG', 'Kilauea CH', 'Kilauea CI', 'Kilauea CJ', 'Kilauea CK', 'Kilauea CL', 'Kilauea CM', 'Kilauea CN', 'Kilauea CO', 'Kilauea CP', 'Kilauea CQ', 'Kilauea CR', 'Kilauea CS', 'Kilauea CT', 'Kilauea CU', 'Kilauea CV', 'Kilauea CW', 'Kilauea CX', 'Kilauea CY', 'Kilauea CZ', 'Kilauea DA', 'Kilauea DB', 'Kilauea DC', 'Kilauea DD', 'Kilauea DE', 'Kilauea DF', 'Kilauea DG', 'Kilauea DH', 'Kilauea DI', 'Kilauea DJ', 'Kilauea DK', 'Kilauea DL', 'Kilauea DM', 'Kilauea DN', 'Kilauea DO', 'Kilauea DP', 'Kilauea DQ', 'Kilauea DR', 'Kilauea DS', 'Kilauea DT', 'Kilauea DU', 'Kilauea DV', 'Kilauea DW', 'Kilauea DX', 'Kilauea DY', 'Kilauea DZ', 'Kilauea EA', 'Kilauea EB', 'Kilauea EC', 'Kilauea ED', 'Kilauea EE', 'Kilauea EF', 'Kilauea EG', 'Kilauea EH', 'Kilauea EI', 'Kilauea EJ', 'Kilauea EK', 'Kilauea EL', 'Kilauea EM', 'Kilauea EN', 'Kilauea EO', 'Kilauea EP', 'Kilauea EQ', 'Kilauea ER', 'Kilauea ES', 'Kilauea ET', 'Kilauea EU', 'Kilauea EV', 'Kilauea EW', 'Kilauea EX', 'Kilauea EY', 'Kilauea EZ', 'Kilauea FA', 'Kilauea FB', 'Kilauea FC', 'Kilauea FD', 'Kilauea FE', 'Kilauea FF', 'Kilauea FG', 'Kilauea FH', 'Kilauea FI', 'Kilauea FJ', 'Kilauea FK', 'Kilauea FL', 'Kilauea FM', 'Kilauea FN', 'Kilauea FO', 'Kilauea FP', 'Kilauea FQ', 'Kilauea FR', 'Kilauea FS', 'Kilauea FT', 'Kilauea FU', 'Kilauea FV', 'Kilauea FW', 'Kilauea FX', 'Kilauea FY', 'Kilauea FZ', 'Kilauea GA', 'Kilauea GB', 'Kilauea GC', 'Kilauea GD', 'Kilauea GE', 'Kilauea GF', 'Kilauea GG', 'Kilauea GH', 'Kilauea GI', 'Kilauea GJ', 'Kilauea GK', 'Kilauea GL', 'Kilauea GM', 'Kilauea GN', 'Kilauea GO', 'Kilauea GP', 'Kilauea GQ', 'Kilauea GR', 'Kilauea GS', 'Kilauea GT', 'Kilauea GU', 'Kilauea GV', 'Kilauea GW', 'Kilauea GX', 'Kilauea GY', 'Kilauea GZ', 'Kilauea HA', 'Kilauea HB', 'Kilauea HC', 'Kilauea HD', 'Kilauea HE', 'Kilauea HF', 'Kilauea HG', 'Kilauea HH', 'Kilauea HI', 'Kilauea HJ', 'Kilauea HK', 'Kilauea HL', 'Kilauea HM', 'Kilauea HN', 'Kilauea HO', 'Kilauea HP', 'Kilauea HQ', 'Kilauea HR', 'Kilauea HS', 'Kilauea HT', 'Kilauea HU', 'Kilauea HV', 'Kilauea HW', 'Kilauea HX', 'Kilauea HY', 'Kilauea HZ', 'Kilauea IA', 'Kilauea IB', 'Kilauea IC', 'Kilauea ID', 'Kilauea IE', 'Kilauea IF', 'Kilauea IG', 'Kilauea IH', 'Kilauea II', 'Kilauea IJ', 'Kilauea IK', 'Kilauea IL', 'Kilauea IM', 'Kilauea IN', 'Kilauea IO', 'Kilauea IP', 'Kilauea IQ', 'Kilauea IR', 'Kilauea IS', 'Kilauea IT', 'Kilauea IU', 'Kilauea IV', 'Kilauea IW', 'Kilauea IX', 'Kilauea IY', 'Kilauea IZ', 'Kilauea JA', 'Kilauea JB', 'Kilauea JC', 'Kilauea JD', 'Kilauea JE', 'Kilauea JF', 'Kilauea JG', 'Kilauea JH', 'Kilauea JI', 'Kilauea JJ', 'Kilauea JK', 'Kilauea JL', 'Kilauea JM', 'Kilauea JN', 'Kilauea JO', 'Kilauea JP', 'Kilauea JQ', 'Kilauea JR', 'Kilauea JS', 'Kilauea JT', 'Kilauea JU', 'Kilauea JV', 'Kilauea JW', 'Kilauea JX', 'Kilauea JY', 'Kilauea JZ', 'Kilauea KA', 'Kilauea KB', 'Kilauea KC', 'Kilauea KD', 'Kilauea KE', 'Kilauea KF', 'Kilauea KG', 'Kilauea KH', 'Kilauea KI', 'Kilauea KJ', 'Kilauea KK', 'Kilauea KL', 'Kilauea KM', 'Kilauea KN', 'Kilauea KO', 'Kilauea KP', 'Kilauea KQ', 'Kilauea KR', 'Kilauea KS', 'Kilauea KT', 'Kilauea KU', 'Kilauea KV', 'Kilauea KW', 'Kilauea KX', 'Kilauea KY', 'Kilauea KZ', 'Kilauea LA', 'Kilauea LB', 'Kilauea LC', 'Kilauea LD', 'Kilauea LE', 'Kilauea LF', 'Kilauea LG', 'Kilauea LH', 'Kilauea LI', 'Kilauea LJ', 'Kilauea LK', 'Kilauea LL', 'Kilauea LM', 'Kilauea LN', 'Kilauea LO', 'Kilauea LP', 'Kilauea LQ', 'Kilauea LR', 'Kilauea LS', 'Kilauea LT', 'Kilauea LU', 'Kilauea LV', 'Kilauea LW', 'Kilauea LX', 'Kilauea LY', 'Kilauea LZ', 'Kilauea MA', 'Kilauea MB', 'Kilauea MC', 'Kilauea MD', 'Kilauea ME', 'Kilauea MF', 'Kilauea MG', 'Kilauea MH', 'Kilauea MI', 'Kilauea MJ', 'Kilauea MK', 'Kilauea ML', 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'Kilauea PF', 'Kilauea PG', 'Kilauea PH', 'Kilauea PI', 'Kilauea PJ', 'Kilauea PK', 'Kilauea PL', 'Kilauea PM', 'Kilauea PN', 'Kilauea PO', 'Kilauea PP', 'Kilauea PQ', 'Kilauea PR', 'Kilauea PS', 'Kilauea PT', 'Kilauea PU', 'Kilauea PV', 'Kilauea PW', 'Kilauea PX', 'Kilauea PY', 'Kilauea PZ', 'Kilauea QA', 'Kilauea QB', 'Kilauea QC', 'Kilauea QD', 'Kilauea QE', 'Kilauea QF', 'Kilauea QG', 'Kilauea QH', 'Kilauea QI', 'Kilauea QJ', 'Kilauea QK', 'Kilauea QL', 'Kilauea QM', 'Kilauea QN', 'Kilauea QO', 'Kilauea QP', 'Kilauea QQ', 'Kilauea QR', 'Kilauea QS', 'Kilauea QT', 'Kilauea QU', 'Kilauea QV', 'Kilauea QW', 'Kilauea QX', 'Kilauea QY', 'Kilauea QZ', 'Kilauea RA', 'Kilauea RB', 'Kilauea RC', 'Kilauea RD', 'Kilauea RE', 'Kilauea RF', 'Kilauea RG', 'Kilauea RH', 'Kilauea RI', 'Kilauea RJ', 'Kilauea RK', 'Kilauea RL', 'Kilauea RM', 'Kilauea RN', 'Kilauea RO', 'Kilauea RP', 'Kilauea RQ', 'Kilauea RR', 'Kilauea RS', 'Kilauea RT', 'Kilauea RU', 'Kilauea RV', 'Kilauea RW', 'Kilauea RX', 'Kilauea RY', 'Kilauea RZ', 'Kilauea SA', 'Kilauea SB', 'Kilauea SC', 'Kilauea SD', 'Kilauea SE', 'Kilauea SF', 'Kilauea SG', 'Kilauea SH', 'Kilauea SI', 'Kilauea SJ', 'Kilauea SK', 'Kilauea SL', 'Kilauea SM', 'Kilauea SN', 'Kilauea SO', 'Kilauea SP', 'Kilauea SQ', 'Kilauea SR', 'Kilauea SS', 'Kilauea ST', 'Kilauea SU', 'Kilauea SV', 'Kilauea SW', 'Kilauea SX', 'Kilauea SY', 'Kilauea SZ', 'Kilauea TA', 'Kilauea TB', 'Kilauea TC', 'Kilauea TD', 'Kilauea TE', 'Kilauea TF', 'Kilauea TG', 'Kilauea TH', 'Kilauea TI', 'Kilauea TJ', 'Kilauea TK', 'Kilauea TL', 'Kilauea TM', 'Kilauea TN', 'Kilauea TO', 'Kilauea TP', 'Kilauea TQ', 'Kilauea TR', 'Kilauea TS', 'Kilauea TT', 'Kilauea TU', 'Kilauea TV', 'Kilauea TW', 'Kilauea TX', 'Kilauea TY', 'Kilauea TZ', 'Kilauea UA', 'Kilauea UB', 'Kilauea UC', 'Kilauea UD', 'Kilauea UE', 'Kilauea UF', 'Kilauea UG', 'Kilauea UH', 'Kilauea UI', 'Kilauea UJ', 'Kilauea UK', 'Kilauea UL', 'Kilauea UM', 'Kilauea UN', 'Kilauea UO', 'Kilauea UP', 'Kilauea UQ', 'Kilauea UR', 'Kilauea US', 'Kilauea UT', 'Kilauea UU', 'Kilauea UV', 'Kilauea UW', 'Kilauea UX', 'Kilauea UY', 'Kilauea UZ', 'Kilauea VA', 'Kilauea VB', 'Kilauea VC', 'Kilauea VD', 'Kilauea VE', 'Kilauea VF', 'Kilauea VG', 'Kilauea VH', 'Kilauea VI', 'Kilauea VJ', 'Kilauea VK', 'Kilauea VL', 'Kilauea VM', 'Kilauea VN', 'Kilauea VO', 'Kilauea VP', 'Kilauea VQ', 'Kilauea VR', 'Kilauea VS', 'Kilauea VT', 'Kilauea VU', 'Kilauea VV', 'Kilauea VW', 'Kilauea VX', 'Kilauea VY', 'Kilauea VZ', 'Kilauea WA', 'Kilauea WB', 'Kilauea WC', 'Kilauea WD', 'Kilauea WE', 'Kilauea WF', 'Kilauea WG', 'Kilauea WH', 'Kilauea WI', 'Kilauea WJ', 'Kilauea WK', 'Kilauea WL', 'Kilauea WM', 'Kilauea WN', 'Kilauea WO', 'Kilauea WP', 'Kilauea WQ', 'Kilauea WR', 'Kilauea WS', 'Kilauea WT', 'Kilauea WU', 'Kilauea WV', 'Kilauea WW', 'Kilauea WX', 'Kilauea WY', 'Kilauea WZ', 'Kilauea XA', 'Kilauea XB', 'Kilauea XC', 'Kilauea XD', 'Kilauea XE', 'Kilauea XF', 'Kilauea XG', 'Kilauea XH', 'Kilauea XI', 'Kilauea XJ', 'Kilauea XK', 'Kilauea XL', 'Kilauea XM', 'Kilauea XN', 'Kilauea XO', 'Kilauea XP', 'Kilauea XQ', 'Kilauea XR', 'Kilauea XS', 'Kilauea XT', 'Kilauea XU', 'Kilauea XV', 'Kilauea XW', 'Kilauea XX', 'Kilauea XY', 'Kilauea XZ', 'Kilauea YA', 'Kilauea YB', 'Kilauea YC', 'Kilauea YD', 'Kilauea YE', 'Kilauea YF', 'Kilauea YG', 'Kilauea YH', 'Kilauea YI', 'Kilauea YJ', 'Kilauea YK', 'Kilauea YL', 'Kilauea YM', 'Kilauea YN', 'Kilauea YO', 'Kilauea YP', 'Kilauea YQ', 'Kilauea YR', 'Kilauea YS', 'Kilauea YT', 'Kilauea YU', 'Kilauea YV', 'Kilauea YW', 'Kilauea YX', 'Kilauea YY', 'Kilauea YZ', 'Kilauea ZA', 'Kilauea ZB', 'Kilauea ZC', 'Kilauea ZD', 'Kilauea ZE', 'Kilauea ZF', 'Kilauea ZG', 'Kilauea ZH', 'Kilauea ZI', 'Kilauea ZJ', 'Kilauea ZK', 'Kilauea ZL', 'Kilauea ZM', 'Kilauea ZN', 'Kilauea ZO', 'Kilauea ZP', 'Kilauea ZQ', 'Kilauea ZR', 'Kilauea ZS', 'Kilauea ZT', 'Kilauea ZU', 'Kilauea ZV', 'Kilauea ZW', 'Kilauea ZX', 'Kilauea ZY', 'Kilauea ZZ'.

The bottom right corner of the interface displays a log window with the following notes:

```
NOTE 10008: Finished opening project 'Kahuku' at time 06 May 2005, 10:23:40.  
NOTE 10179: Opened basin model 'Kahuku_1996' at time 06 May 2005, 10:23:41.  
NOTE 10179: Opened basin model 'Kahuku_Claris' at time 06 May 2005, 10:23:41.  
NOTE 10179: Opened basin model 'Kahuku_1996' at time 06 May 2005, 10:23:41.  
NOTE 10179: Opened basin model 'Kahuku' at time 06 May 2005, 10:24:53.  
NOTE 10180: Opened meteorologic model '100-Year' at time 06 May 2005, 10:29:05.  
NOTE 10181: Opened control specifications 'Nov 1996' at time 06 May 2005, 10:47:26.  
NOTE 10180: Opened meteorologic model '10-Year R-73' at time 06 May 2005, 13:03:19.  
NOTE 10180: Opened meteorologic model '10-Year R-73' at time 06 May 2005, 13:03:21.  
NOTE 10179: Opened basin model 'Kahuku_Claris' at time 06 May 2005, 13:03:24.  
NOTE 10179: Opened basin model 'Kahuku' at time 06 May 2005, 13:04:03.
```

Subbasin Element Transform Parameter

- Transform Methods
 - Clark UH
 - Kinematic wave
 - ModClark
 - Snyder UH
 - SCS UH
 - User-specified S-graph
 - User-specified UH

Hydrologic Modeling System [C:\hmsproj\Kahuku\Kahuku.hms]

File Edit View Components Parameters Compute Results Tools Help

Loss Transform Baseflow Routing Subbasin Methods Reach Method... Element Inventory

Clark Unit Hydrograph Kinematic Wave ModClark Snyder Unit Hydrograph SCS Unit Hydrograph User-Specified S-Graph User-Specified Unit Hydrograph

Basin Model [Kahuku]

Components Compute Results

Subbasin Loss Transform Baseflow Options

Names: Bakahan Local

Standard Lag (HR) 0.13

Peaking Coefficient: 0.35

NOTE 10008: Finished opening project "Kahuku" at time 06 May 2005, 10:23:40.
NOTE 10179: Opened basin model "Kahuku_1996" at time 06 May 2005, 10:23:41.
NOTE 10179: Opened basin model "Kahuku_Clarke" at time 06 May 2005, 10:23:41.
NOTE 10179: Opened basin model "Kahuku_1996" at time 06 May 2005, 10:23:41.
NOTE 10179: Opened basin model "Kahuku" at time 06 May 2005, 10:24:53.
NOTE 10180: Opened meteorologic model "100-Year" at time 06 May 2005, 10:29:05.
NOTE 10181: Opened control specifications "Nov 1996" at time 06 May 2005, 10:47:28.
NOTE 10180: Opened meteorologic model "100-Year R-73" at time 06 May 2005, 13:03:19.
NOTE 10180: Opened meteorologic model "10-Year R-73" at time 06 May 2005, 13:03:21.
NOTE 10179: Opened basin model "Kahuku_Clarke" at time 06 May 2005, 13:03:24.
NOTE 10179: Opened basin model "Kahuku" at time 06 May 2005, 13:04:03.

Subbasin Element Baseflow Parameter

- Baseflow Methods
 - Bounded Recession
 - Constant monthly
 - Linear reservoir
 - Recession

The screenshot displays the Hydrologic Modeling System (HMS) interface. The main window shows a map of the Kahuku watershed with various subbasins and elements. The 'Basin Model' window is open, showing a list of elements on the left and a map on the right. The 'Baseflow' parameter settings for the 'Bakahan Local' subbasin are shown in the bottom panel.

Baseflow Parameters for Bakahan Local:

Parameter	Value
Initial Type	Discharge Per Area
Initial Discharge (CFS/MI ²)	1.00
Recession Constant	1.00
Threshold Type	Threshold Discharge
Threshold Flow (CFS)	1

Log Notes:

- NOTE 10008: Finished opening project 'Kahuku' at time 06 May 2005, 10:23:40.
- NOTE 10179: Opened basin model 'Kahuku_1996' at time 06 May 2005, 10:23:41.
- NOTE 10179: Opened basin model 'Kahuku_Claris' at time 06 May 2005, 10:23:41.
- NOTE 10179: Opened basin model 'Kahuku_1996' at time 06 May 2005, 10:23:41.
- NOTE 10179: Opened basin model 'Kahuku' at time 06 May 2005, 10:24:53.
- NOTE 10180: Opened meteorologic model '100-Year' at time 06 May 2005, 10:29:05.
- NOTE 10181: Opened control specifications 'Nov 1956' at time 06 May 2005, 10:47:26.
- NOTE 10180: Opened meteorologic model '100-Year R-73' at time 06 May 2005, 13:03:19.
- NOTE 10180: Opened meteorologic model '100-Year R-73' at time 06 May 2005, 13:03:21.
- NOTE 10179: Opened basin model 'Kahuku_Claris' at time 06 May 2005, 13:03:24.
- NOTE 10179: Opened basin model 'Kahuku' at time 06 May 2005, 13:04:03.

Reach Parameters

- Routing Methods
 - Kinematic Wave
 - Lag
 - Modified Puls
 - Muskingum
 - Muskingum-Cunge
 - Straddle-Stagger

Hydrologic Modeling System [C:\Hmsproj\Kahuku\Kahuku.hms]

File Edit View Components Parameters Compute Results Tools Help

Loss Transform Baseflow Routing Subbasin Methods Reach Method... Element Inventory

Kinematic Wave Lag Modified Puls Muskingum Muskingum-Cunge Straddle Stagger

Basin Model [Kahuku]

NOTE 10008: Finished opening project "Kahuku" at time 06 May 2005, 10:23:40.
NOTE 10179: Opened basin model "Kahuku_1996" at time 06 May 2005, 10:23:41.
NOTE 10179: Opened basin model "Kahuku_Clark" at time 06 May 2005, 10:23:41.
NOTE 10179: Opened basin model "Kahuku_1996" at time 06 May 2005, 10:23:41.
NOTE 10179: Opened basin model "Kahuku" at time 06 May 2005, 10:24:53.
NOTE 10180: Opened meteorologic model "100-Year" at time 06 May 2005, 10:29:05.
NOTE 10181: Opened control specifications "Nov 1996" at time 06 May 2005, 10:47:28.
NOTE 10180: Opened meteorologic model "100-Year R-73" at time 06 May 2005, 13:03:19.
NOTE 10180: Opened meteorologic model "10-Year R-73" at time 06 May 2005, 13:03:21.
NOTE 10179: Opened basin model "Kahuku_Clark" at time 06 May 2005, 13:03:24.
NOTE 10179: Opened basin model "Kahuku" at time 06 May 2005, 13:04:03.

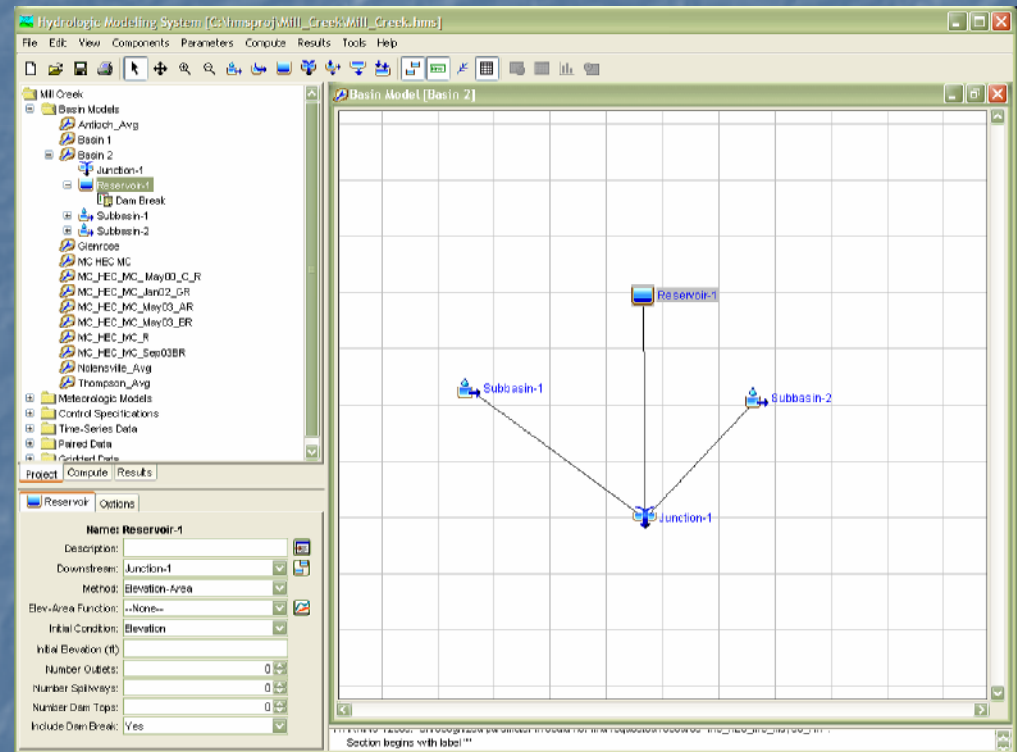
Components Compute Results

Reach Route Options

Name: R130
Length (FT) 2315
Slope (FT/FT) 0.0028
Manning's n 0.035
Shape Trapezoid
Bottom Width (FT) 5.0
Side Slope (FT) 2.0

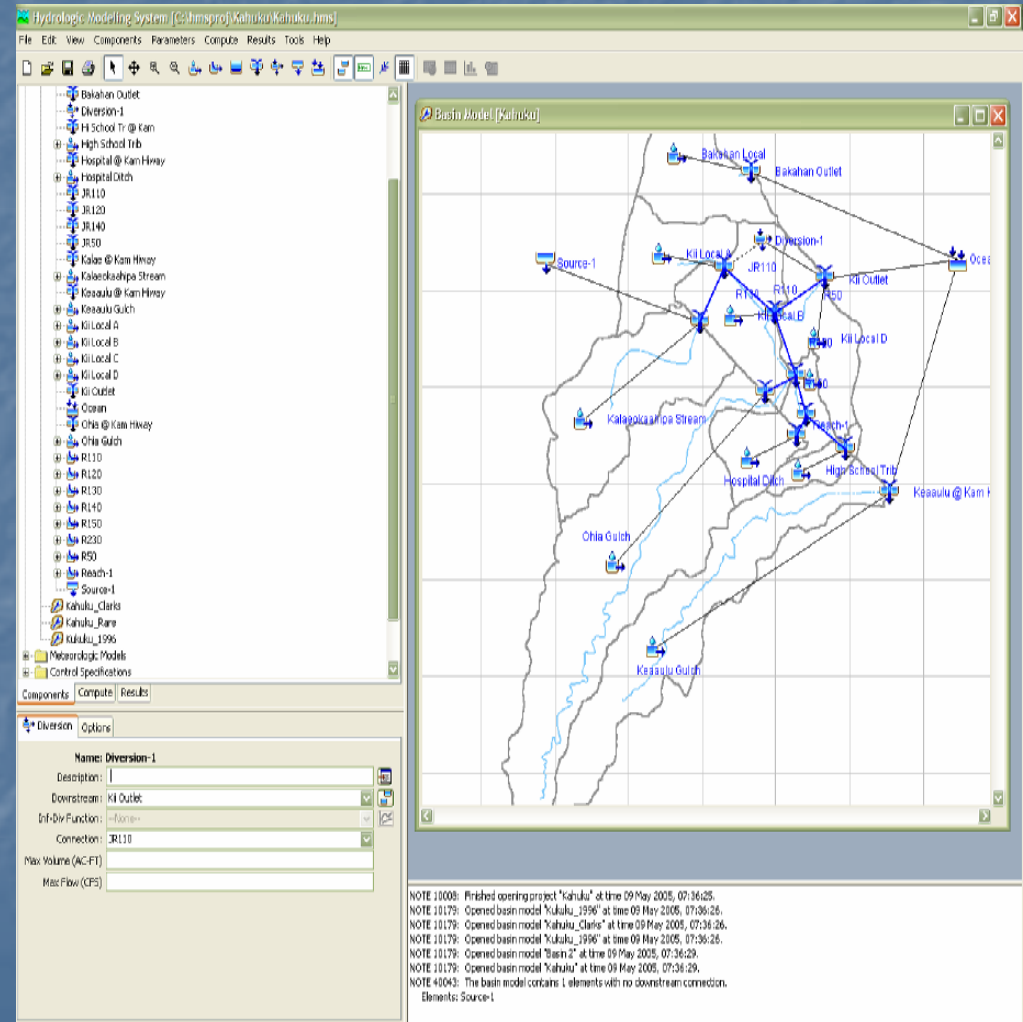
Reservoir Parameters

- Reservoir Methods
 - Simplified Routing
 - Storage-Outflow
 - Elevation-Storage-Outflow
 - Elevation-Area-Outflow
 - Detailed Routing
 - Elevation- Storage
 - Elevation-Area
 - Outlet
 - Spillway
 - Overflow
 - Dam Failure



Additional Elements

- Junction
- Diversion
- Source
- Sink



Global Editors

The screenshot displays the Hydrologic Modeling System (HMS) software interface. The main window shows a watershed map with various subbasins and flow paths. A 'Snyder Transform' dialog box is open, displaying a table of subbasin parameters. The table lists subbasins such as 'Bakahan Local', 'High School Trib', 'Hospital Ditch', 'Kalaekoa Stream', 'Keaoulu Gulch', and 'Ohia Gulch', along with their respective Lag Time (HR) and Peaking Coefficient values. The dialog box also includes 'Apply' and 'Close' buttons.

Subbasin	Lag Time (HR)	Peaking Coefficient
Bakahan Local	0.13	0.35
High School Trib	0.12	0.35
Hospital Ditch	0.11	0.35
Kalaekoa Stream	0.23	0.35
Keaoulu Gulch	0.35	0.35
Kii Local A	0.14	0.35
Kii Local B	0.20	0.35
Kii Local C	0.14	0.35
Kii Local D	0.17	0.35
Ohia Gulch	0.42	0.35

The interface also shows a project tree on the left, a 'Basin Model' configuration panel at the bottom left, and a log window at the bottom right with the following text:

```
NOTE 10008: Finished opening project "kahuku" at time 09 May 2005, 07:36:25.
NOTE 10179: Opened basin model "kahuku_1996" at time 09 May 2005, 07:36:25.
NOTE 10179: Opened basin model "kahuku_clarks" at time 09 May 2005, 07:36:25.
NOTE 10179: Opened basin model "kahuku_1996" at time 09 May 2005, 07:36:25.
NOTE 10179: Opened basin model "basin 2" at time 09 May 2005, 07:36:25.
NOTE 10179: Opened basin model "kahuku" at time 09 May 2005, 07:36:29.
```

Global Editors

Hydrologic Modeling System [C:\msproj\Kahuku\Kahuku.hms]

File Edit View Components Parameters Compute Results Tools Help

Snyder Transform [Kahuku]

Subbasin	Lag Time (HR)	Peaking Coefficient
Bakahan Local	0.13	0.35
High School Trib	0.12	0.35
Hospital Ditch	0.11	0.35
Kalaekoaehipa Stre...	0	0.35
Keaaulu Gulch	0	0.35
Ki Local A	0	0.35
Ki Local B	0	0.35
Ki Local C	0	0.35
Ki Local D	0	0.35
Ohio Gulch	0	0.35

Basin Model

Name: Kahuku

Description: Basin model created with HEC-GeoHMS v1.1 Beta

Grid Cell File:

Local Flow: No

Flow Rates: No

Blending: No

Replace Missing: No

Unit System: U.S. Customary

NOTE 10008: Finished opening project "Kahuku" at time 09 May 2005, 07:36:25.
 NOTE 10179: Opened basin model "Kahuku_1996" at time 09 May 2005, 07:36:26.
 NOTE 10179: Opened basin model "Kahuku_Clerks" at time 09 May 2005, 07:36:26.
 NOTE 10179: Opened basin model "Kahuku_1996" at time 09 May 2005, 07:36:26.
 NOTE 10179: Opened basin model "Basin 2" at time 09 May 2005, 07:36:29.
 NOTE 10179: Opened basin model "Kahuku" at time 09 May 2005, 07:36:29.

Meteorological Models

The screenshot displays the Hydrologic Modeling System (HMS) software interface. The main window shows a basin model with a network of streams and outlets. A dialog box titled "Meteorologic Model Manager" is open, listing current meteorologic models. The "100-Year" model is selected. The "Basin Model [Kahuku]" window shows a map of the Kahuku basin with various outlets and stream segments. The "Meteorologic Model Manager" dialog box contains the following information:

Current meteorologic models

- 10-Year
- 10-Year R-73
- 100-Year
- 100-Year R-73
- 2-Year
- 2-Year R-73
- 25-Year
- 25-Year R-73
- 5-Year
- 5-Year R-73
- 50-Year
- 50-Year R-73
- 500-Year R-73
- Nov 1996
- SPS
- SPS 1-Hr Adjusted

Buttons: New..., Copy..., Rename..., Delete

Basin Model [Kahuku] details:

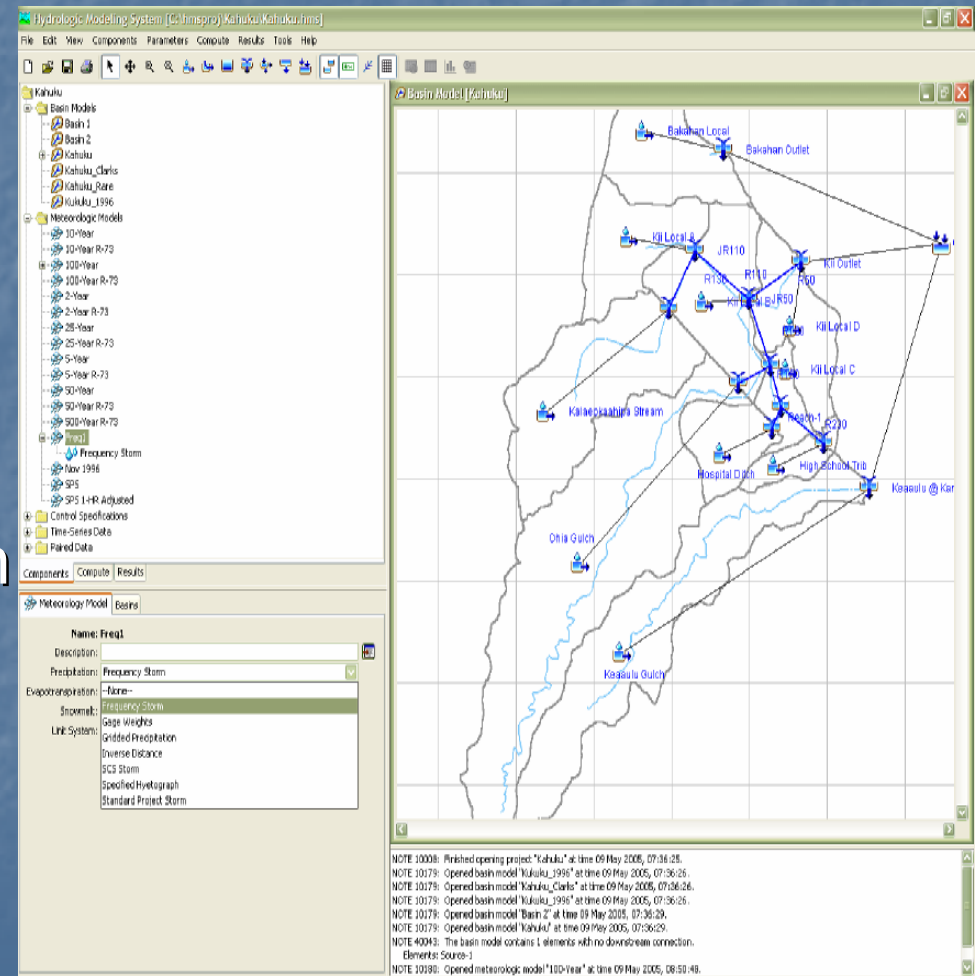
- Name: 100-Year
- Description:
- Precipitation: Specified Hyetograph
- Evapotranspiration: --None--
- Snowmelt: --None--
- Unit System: U.S. Customary

Log messages:

- NOTE 10005: Finished opening project 'Kahuku' at time 09 May 2005, 07:36:25.
- NOTE 10179: Opened basin model 'Kukuku_1996' at time 09 May 2005, 07:36:26.
- NOTE 10179: Opened basin model 'Kahuku_Clark' at time 09 May 2005, 07:36:26.
- NOTE 10179: Opened basin model 'Kukuku_1996' at time 09 May 2005, 07:36:26.
- NOTE 10179: Opened basin model 'Basin 2' at time 09 May 2005, 07:36:29.
- NOTE 10179: Opened basin model 'Kahuku' at time 09 May 2005, 07:36:29.
- NOTE 40043: The basin model contains 1 elements with no downstream connection. Elements: Source-1
- NOTE 10180: Opened meteorologic model '100-Year' at time 09 May 2005, 08:50:48.

Met Model Choices

- Precipitation
 - Frequency storm
 - Gridded precipitation
 - Inverse-distance gage weighting
 - Standard project storm
 - User hyetograph
 - User-specified gage weighting



Met Model Editor

- Reflects Model Type

Meteorology Model Basins

Name: Freq1

Description:

Precipitation: Frequency Storm

Evapotranspiration: --None--

Snowmelt: --None--

Unit System: U.S. Customary

Meteorology Model Basins

Name: Freq1

Basin Model	Include Subbasins
Basin 1	Yes
Kahuku	No
Kahuku_Clarks	No
Kahuku_Rare	No
Kukuku_1996	No
Basin 2	No

Precipitation

Name: Freq1

Probability: 0.2 Percent

Series Type: Annual Duration

Intensity Duration: 5 Minutes

Storm Duration: 1 Hour

Intensity Position: 50 Percent

Storm Area (MI2)

5 Minutes (in)

15 Minutes (in)

1 Hour (in)

2 Hours (in)

3 Hours (in)

6 Hours (in)

12 Hours (in)

1 Day (in)

Met Model Editor

- Evapotranspiration
 - Priestly-Taylor
 - Crop Coefficient
 - Solar Radiation
 - Temperature
 - Gridded P-T
 - Monthly Average
 - Pan Coeff.
 - Rate

Evapotranspiration

Crop Coefficient Gage: --None--

Dryness Coefficient:

Solar Gage: --None--

Temperature Gage: --None--

500-Year R-73

Freq1

- Frequency Storm
- Bakahan Local
 - Priestley-Taylor
- High School Trib
- Hospital Ditch
- Kalaeokaahipa Stream
- Keaaulu Gulch
- Kii Local A
- Kii Local B
- Kii Local C
- Kii Local D
- Ohia Gulch
- Nov 1996
- SPS

Components Compute Results

Meteorology Model Basins

Name: Freq1

Description:

Precipitation: Frequency Storm

Evapotranspiration: Priestley-Taylor

Snowmelt: --None--

Unit System: Gridded Priestley-Taylor
Monthly Average
Priestley-Taylor

Met Model Editor

- Snowmelt
 - Temperature Index
 - Gridded Temp Index

Temp Index

Rain Temperature ()	<input type="text"/>
Base Temperature ()	<input type="text"/>
Wet Meltrate ()	<input type="text"/>
Rain Rate Limit ()	<input type="text"/>
ATI-Meltrate Coefficient:	<input type="text"/>
ATI-Meltrate Function:	--None-- <input type="button" value="v"/> <input type="button" value="R"/>
Meltrate Pattern:	--None-- <input type="button" value="v"/> <input type="button" value="R"/>
Snow Rate Limit ()	<input type="text"/>
ATI-Coldrate Coefficient:	<input type="text"/>
ATI-Coldrate Function:	--None-- <input type="button" value="v"/> <input type="button" value="R"/>
Water Capacity ()	<input type="text"/>
Groundmelt Method:	Fixed Value <input type="button" value="v"/>
Groundmelt ()	<input type="text"/>

The screenshot shows the Met Model Editor interface. The top panel displays a tree view of components under 'Freq1':

- Frequency Storm
- Temperature Index
- Bakahan Local
 - Priestley-Taylor
 - Temperature Index
- High School Trib
- Hospital Ditch
- Kalaeokaahipa Stream
- Keaaulu Gulch
- Kii Local A
- Kii Local B
- Kii Local C

The bottom panel shows the configuration for 'Name: Freq1':

- Description:
- Precipitation: Frequency Storm
- Evapotranspiration: Priestley-Taylor
- Snowmelt: Temperature Index
- Unit System: U.S. Customary

Time Series Data

Types

- Precipitation
- Discharge
- Temperature
- Solar radiation
- Crop Coefficient

Time-Series Gage

Name: Hospital 100Yr

Description:

Data Source: Manual Entry

Units: Incremental Inches

Time Interval: 5 Minutes

Latitude Degrees: 0

Latitude Minutes: 0

Latitude Seconds: 0

Longitude Degrees: 0

Longitude Minutes: 0

Longitude Seconds: 0

Hydrologic Modeling System [C:\hmsproj\Kahuku\Kahuku.hms]

File Edit View Components Parameters Compute Results Tools Help

Basin Manager
Meteorology Manager
Control Manager
Time-Series Data Manager
Paired Data Manager
Grid Data Manager

Kukuku
Meteorology
Control Sp
Time-Serie
Precipi

Hospital 10-Yr
01Jan2004, 00:05 - 01Jan2004, 23:55
Hospital 10-Yr R-73
01Jan2004, 00:05 - 01Jan2004, 23:55
Hospital 100-Yr R-73
Hospital 100Yr
01Jan2004, 00:05 - 01Jan2004, 23:55
Hospital 2-Yr
Hospital 2-Yr R-73
Hospital 25-Yr
Hospital 25-Yr R-73
Hospital 5-Yr
Hospital 5-Yr R-73
Hospital 50-Yr
Hospital 50-Yr R-73

Time-Series Data Manager

Data Type: Temperature Gages

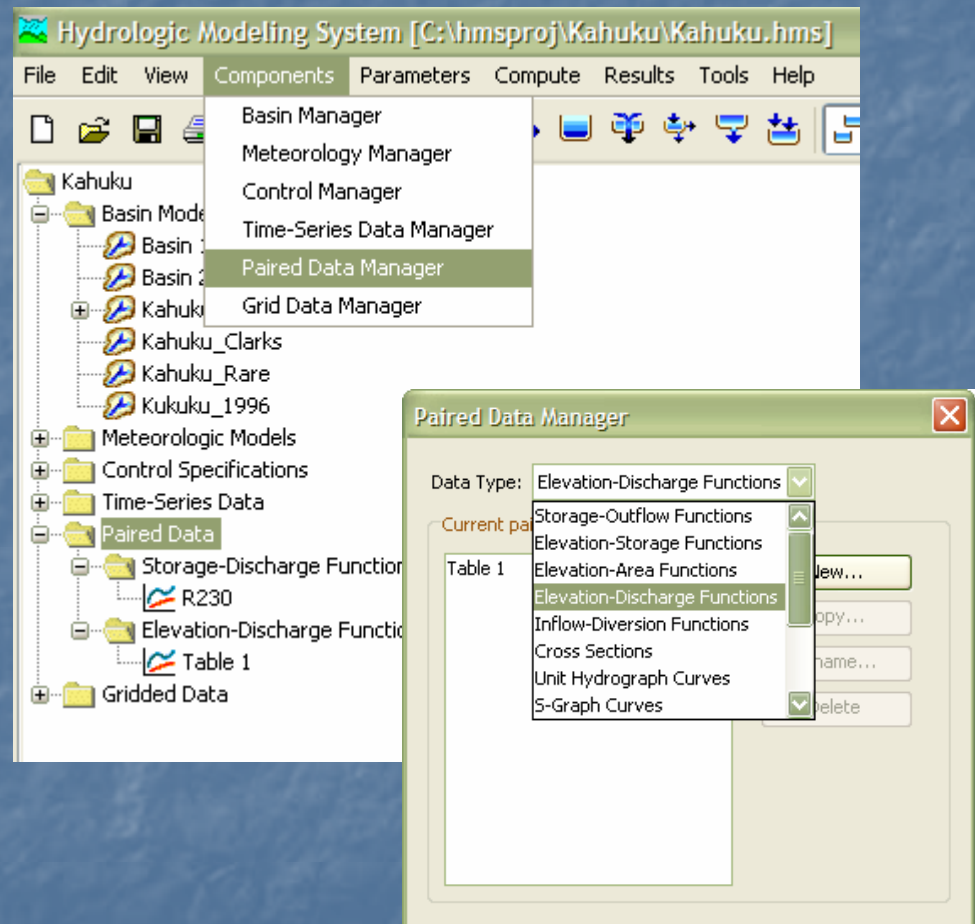
Precipitation Gages
Discharge Gages
Temperature Gages
Solar Radiation Gages
Crop Coefficient Gages

New...
Copy...
Rename...
Delete
Add Window
Delete Window

Paired Data

■ Types

- Storage-Outflow
- Elevation Storage
- Elevation-Area
- Elevation-Discharge
- Inflow-Diversion
- Cross Sections
- Unit Hydrograph
- S-Graph
- ATI Meltrate
- ATI Coldrate
- Groundmelt Patterns
- Evaporation Patterns
- Meltrate patterns

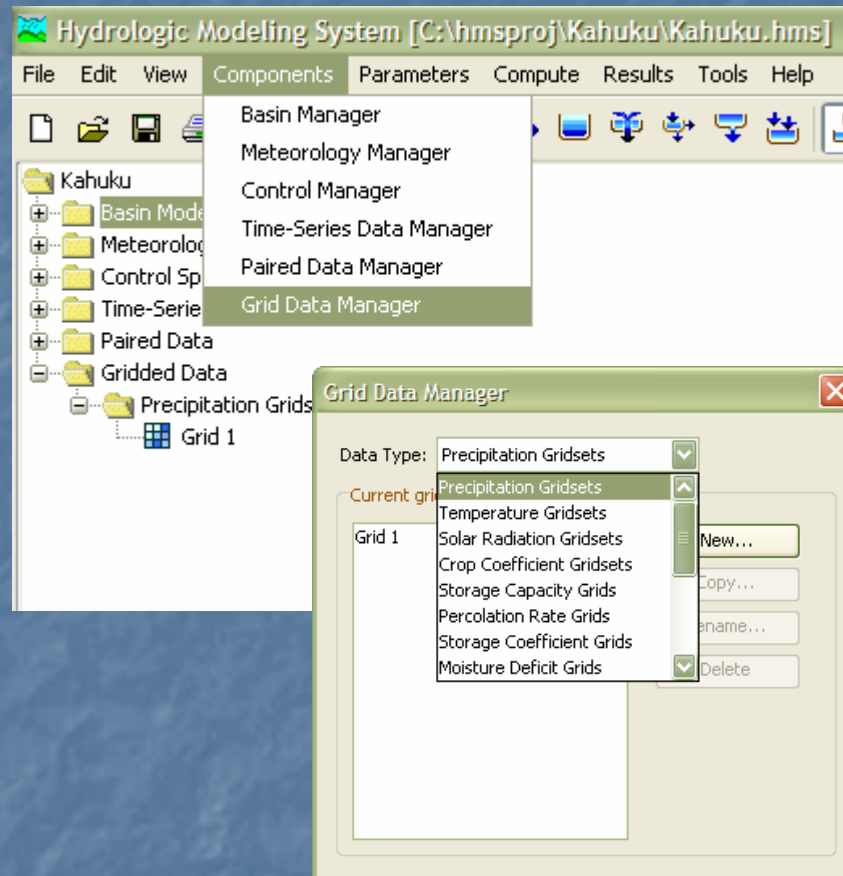


Gridded Data

■ Types

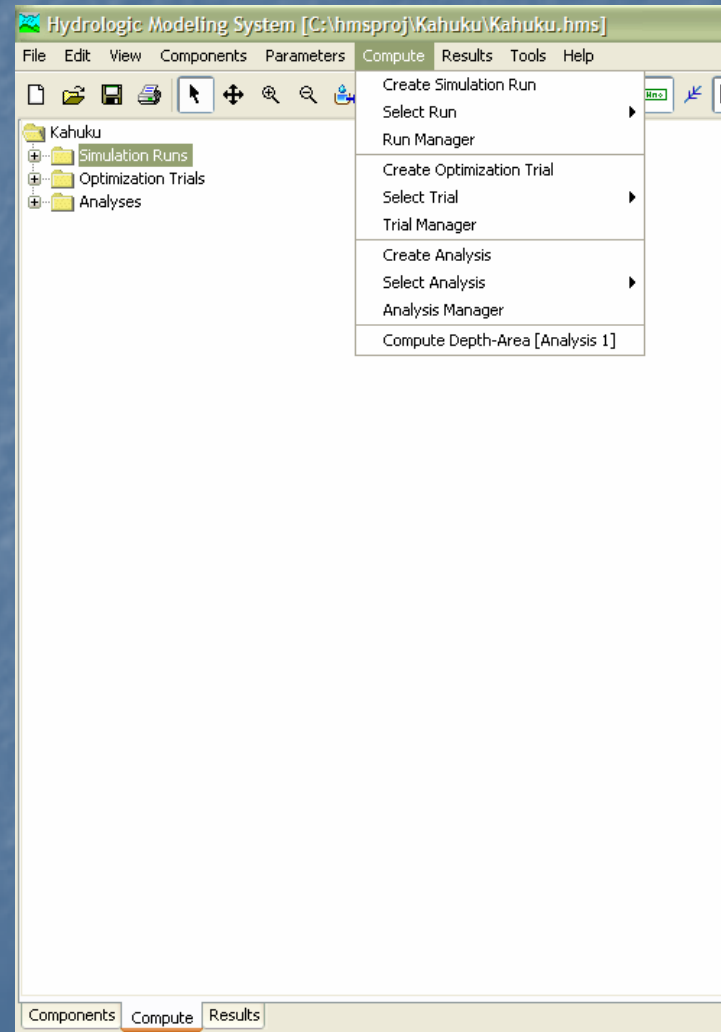
- Precipitation
- Temperature
- Solar radiation
- Crop Coefficient
- Storage Capacity
- Percolation
- Storage Coefficient
- Moisture Deficit
- Impervious Area
- SCS Curve Number
- Elevation
- Cold Content
- Cold Content ATI
- Meltrate ATI
- Liquid Water Content
- Snow Water Equivalent

■ Data Source always DSS

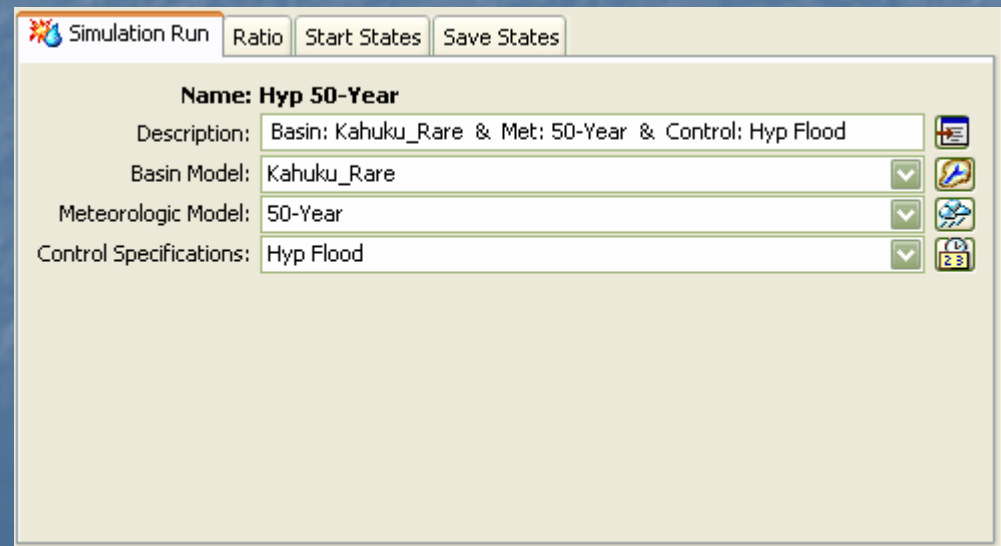
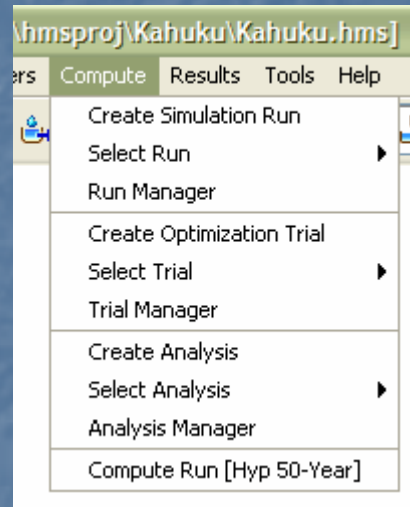
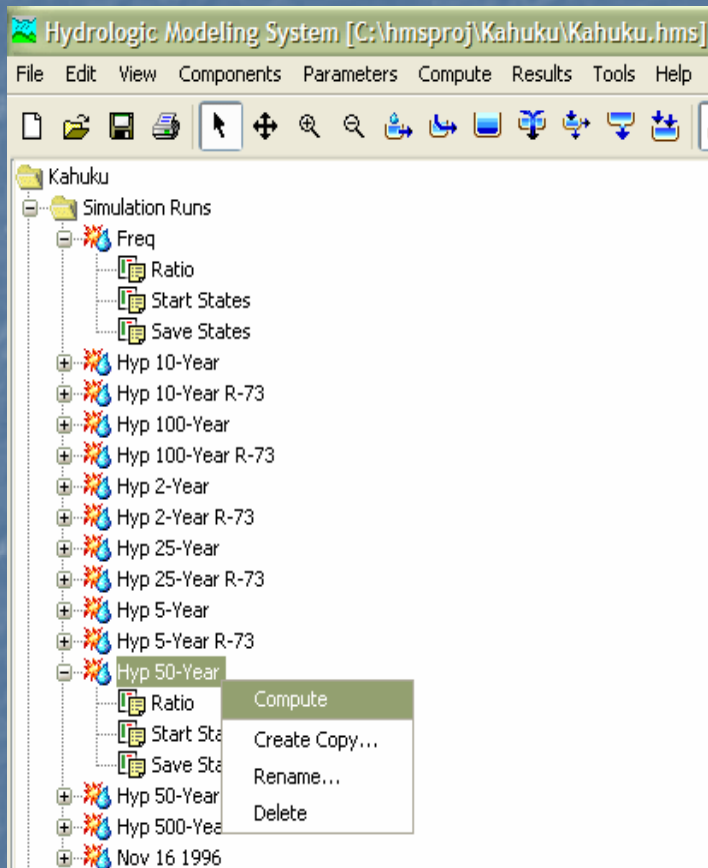


Model Computations

- Simulation
- Optimization
- Depth-Area Analysis

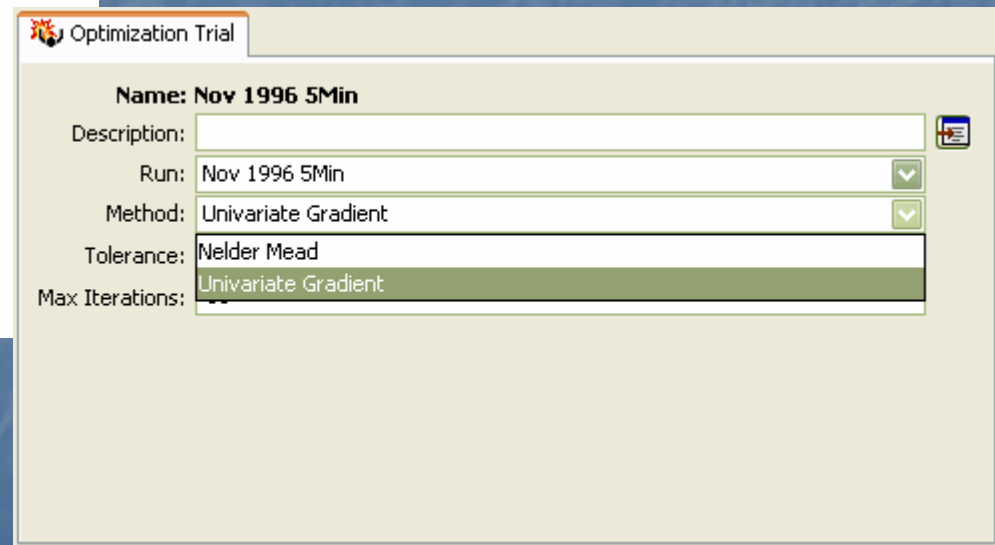
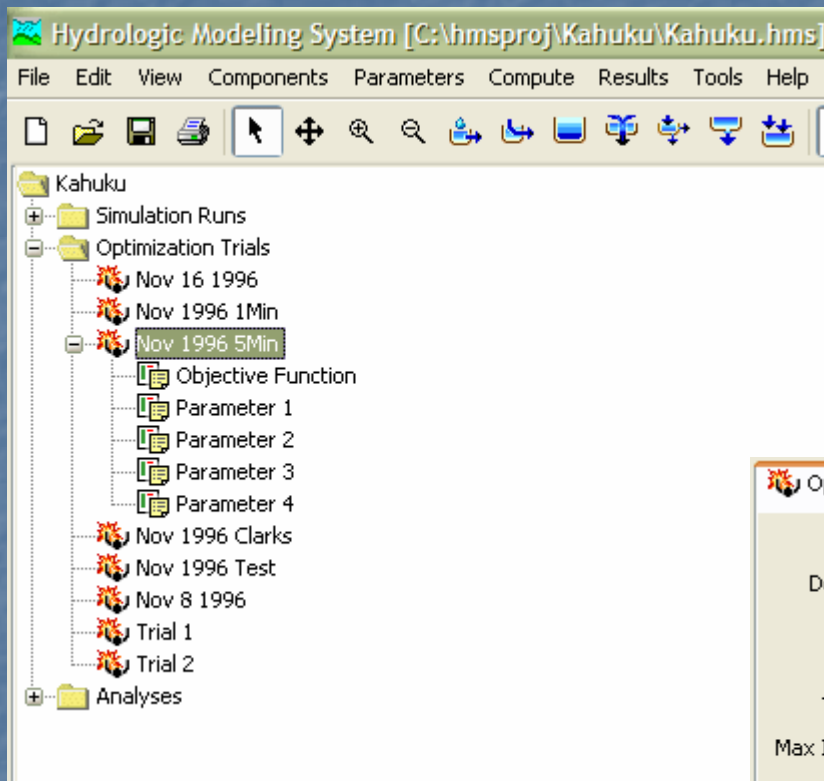


Simulation



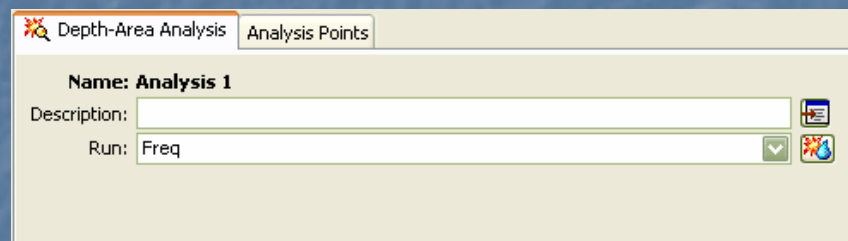
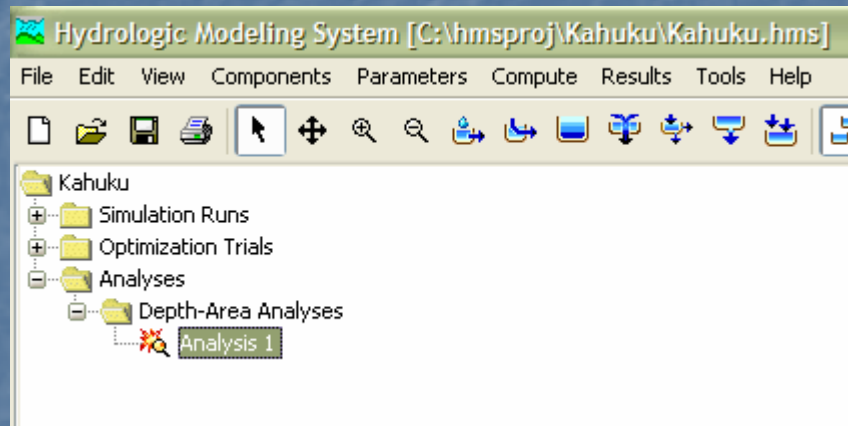
Optimization

- Observed Data
- Existing Simulation



Depth-Area Analysis

- Based on Existing Simulation
- Frequency Storm Met Model



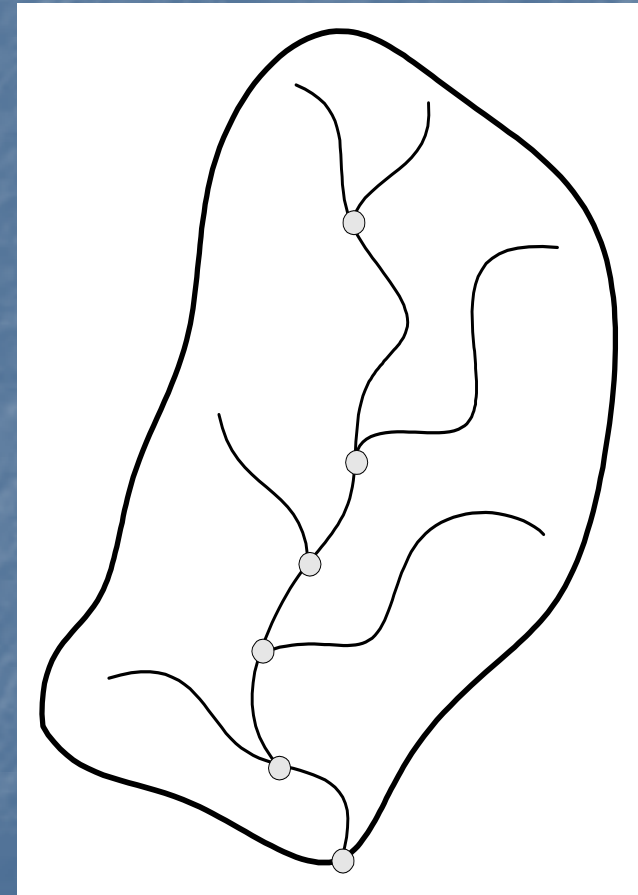
The screenshot shows the "Depth-Area Analysis" configuration dialog with the "Analysis Points" tab selected. The table below lists the analysis points and their corresponding elements.

Analysis Point	Element
Point 1	Bakahan Local
Point 2	Hospital Ditch
Point 3	R50
Point 4	Bakahan Local

Below the table, a list of elements is shown, with "Bakahan Local" selected. The list includes: Bakahan Local, Bakahan Outlet, Hi School Tr @ Kam, High School Trib, Hospital @ Kam Hiway, Hospital Ditch, JR110, and JR120.

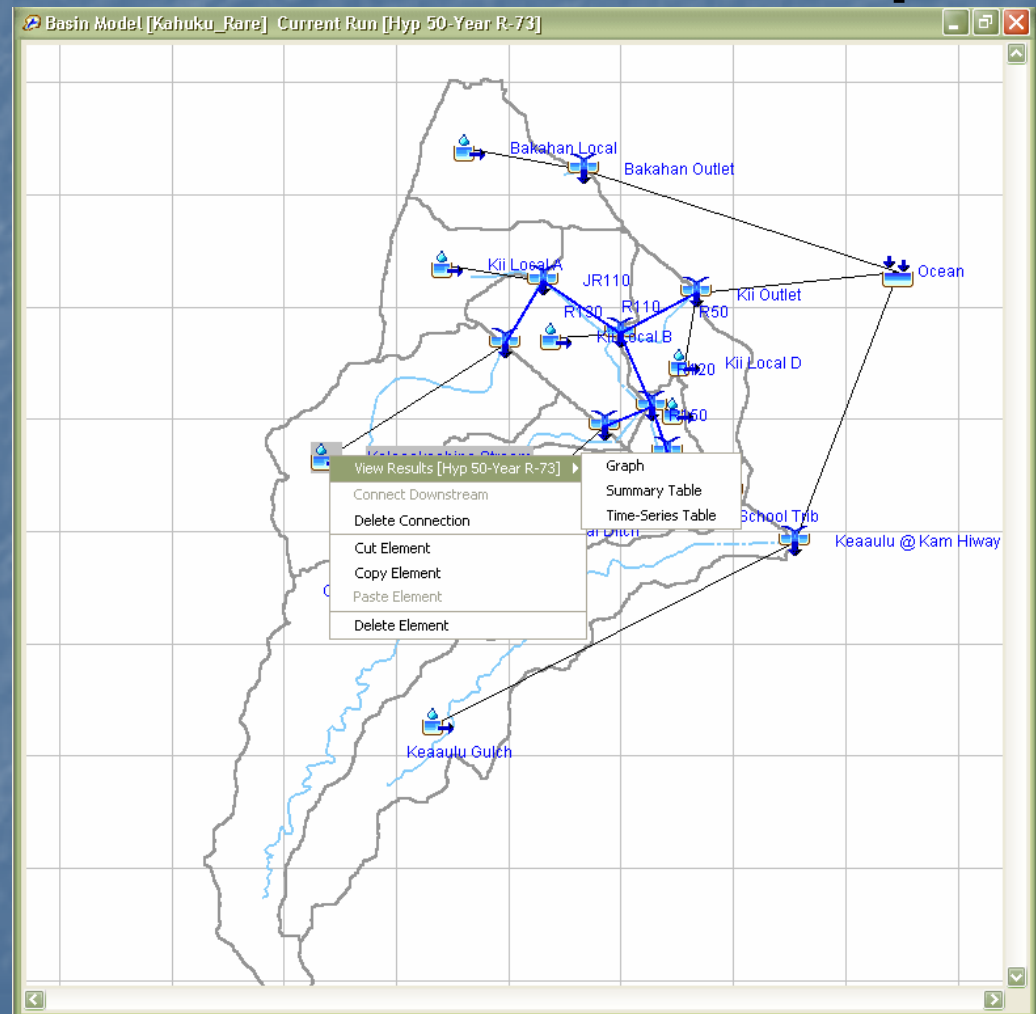
Depth-Area Analysis

- Frequency Storm Application Basis for Many Planning Studies
- Multiple Evaluation Locations Almost Always Necessary
- New Tool Provides Semi-Automated Analysis at Multiple Evaluation Locations
- Will Reduce Errors from Improperly Applied Storms
- Reduce Time to Evaluate Multiple Locations



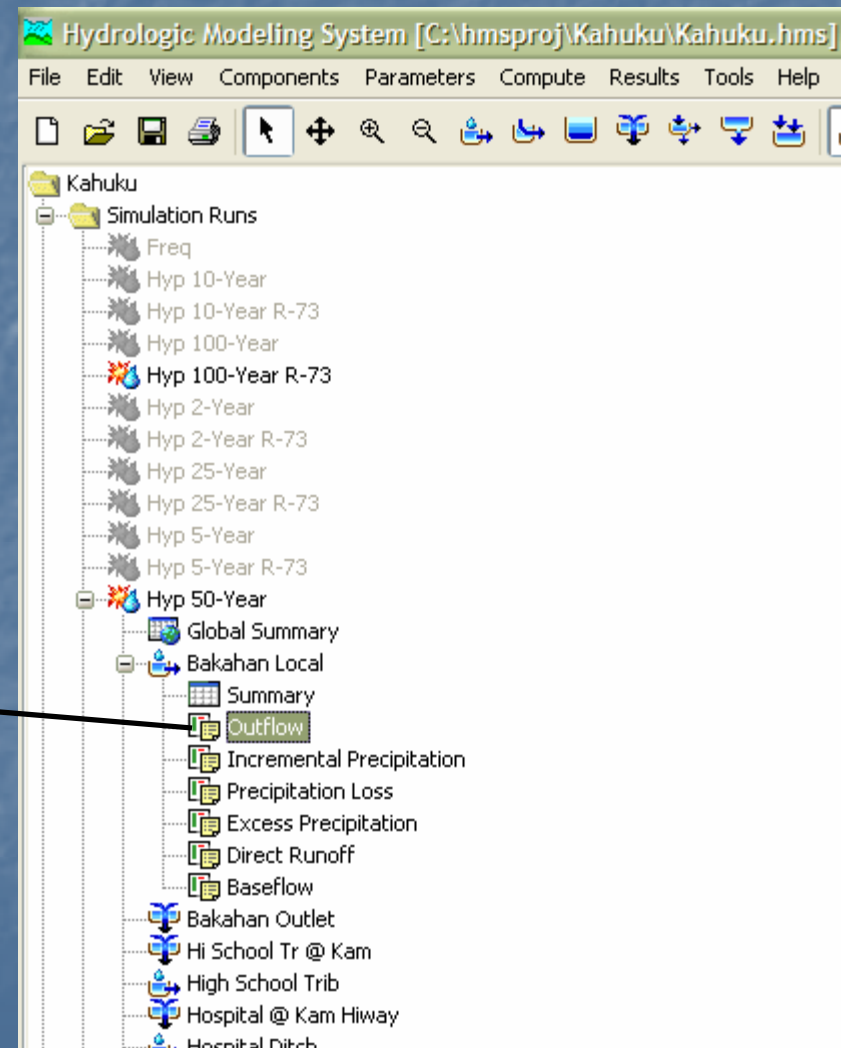
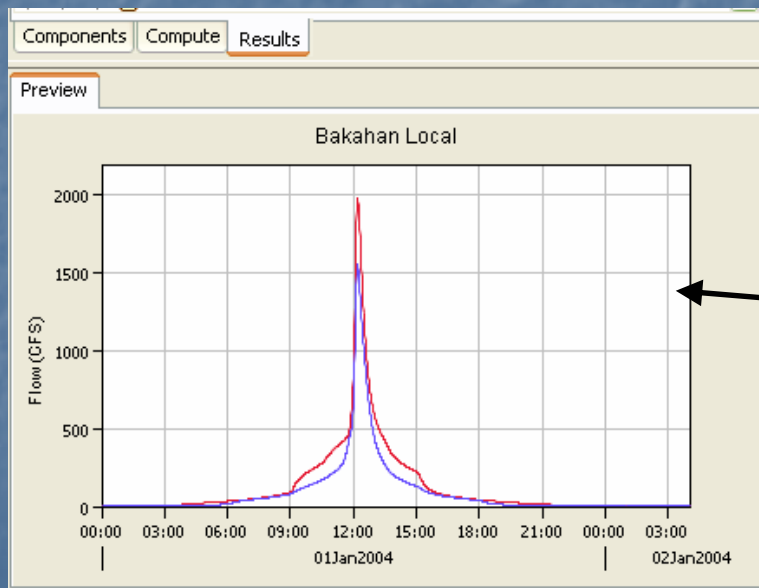
Simulation Results – Basin Map

- Based on Last Compute
 - For Selected Element
 - Graph
 - Summary Table
 - Time Series table
 - Preset Graphs, Tables
 - Based on Element



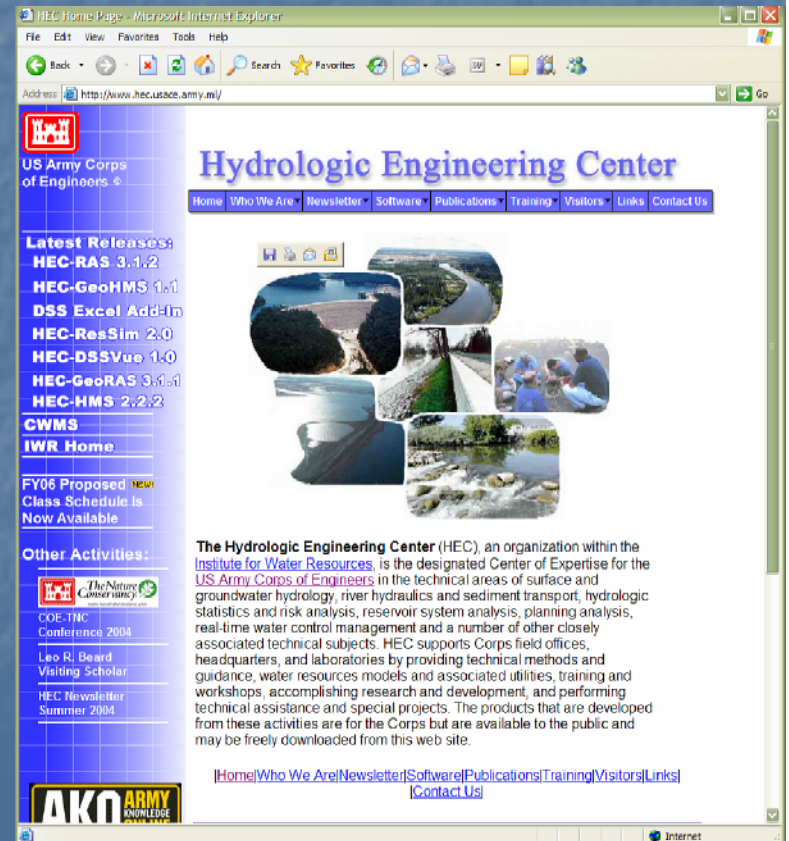
Simulation Results – Results Tree

- Valid Results Enabled
- Compare Multiple Runs
- Plot in Preview Window
- Expand to Large Plot



HEC-HMS Web Access

- Download HEC-HMS from HEC Website
 - <http://www.hec.usace.army.mil/>
- Beta Version HMS 3.0
 - Released and in test phase
- 2003 Statistics
 - 37,000 Downloads
 - 93 Countries



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