Regional Hydrography Framework meeting
9/24/99 Olympia Washington

Attendees:

Objectives:

- **Reach group consensus on regional hydrography ``core'' attributes**
- **Reach consensus on data model**
- **Reach consensus on the set of recommendations produced at Hydro Summit 2.**

Components of Clearing House project (Dale's overview):

- Attributes assigned to framework data
- Data model decisions - routing, indexing etc.
- Clearing house framework management- management policy for clearing house
- Contract with ESRI to provide tool and environment
- Features to be included in Clearinghouse: streams, polygonal features, routed polygon boundaries and points (seeps, springs etc.), anchor points. -since original contract requires only streams this will require a contract modification
- Data warehouse- simple web based application to help us get started on this process and determine what works and what doesn't. It is a throw away effort for the interim- until Framework Server is available. Contract with ESRI to input framework attributes

  Discussion
  - There are technical solutions to some issues- others require policy and procedure. Some issues can be resolved by QA and QC tools when the data is entered into the framework server. Others would be tool complex to program.
  - Some QA/QC would happen locally (where the data is edited) others might happen as data is inserted into the framwork database.
  - There are concerns over not having the complete set of features included at the time the framework server is implemented

Review of Hydro Summit 2 recommendations:

Decisions (Note: I have retained the numbering from the original meeting notes for Hydro Summit II so that you may compare these modifications to the decisions made at that meeting. I have added some text for clarity. Unchanged text appears in regular style. Additions or changes appear in *italics*. Deletions appear in invisible style.):

1) Maintain NHD River Reach ID (RRID) as an event on the LLID routes. *USGS will supply a crosswalk between the RRID and LLID. This is contingent upon decisions made at a national meeting to strategize on the development of NHD. Dale, Nancy Tubbs and Bill Bogue will be attending.*

2) *A)* The measure from the 1:100K routes will be used for streams for which you are not routing the entire stream at 1:24K. *If the 1:100K source coverage units are not in kilometers then they will be converted. All 1:24K measures will be in kilometers.* Users may match any 1:24K measures that they wish to the 1:100K measures. It is only required in the case where the entire stream is not mapped. *(Explanation: There was some question about what "where the entire stream is not mapped" means. This refers to the situation where you are mapping a 1:24K stream (e.g. the McKenzie River) for an area that does not include* ***both*** *the headwaters and the mouth (e.g. the Upper McKenzie 5th field watershed). In those cases the measure (in kilometers) of the points where the stream crosses the watershed boundaries (and thus the intervening measures) would match the measures from the 1:100K. When you are mapping the entire length of a stream at 1:24K you are not obligated to match the 1:100K measures, but you may do so if you choose. Since StreamNet did not participate in this meeting we are still unsure if they are willing to convert the units of the 1:100K to kilometers for all coverages. If not then the user should convert them before conflation.)*
   - *Persons developing 1:24K streams should* coordinate with upstream and downstream 'neighbors' to make sure that adjacent coverage measures match
   - *Persons developing 1:24K streams can* use SRT step 3 procedure to transfer measures from the 1:100K

   B) Establish a database of confluence or watershed entry and exit measures. *We had a lengthy discussion about the establishment of "anchor points" to lock and/or record the location and measure of points in the framework hydrography data set (at watershed boundaries and elsewhere). We first discussed the possibility of creating a point coverage with attributes that included the measure and LLID for features which the point referenced. The difficulty of keeping that in sync with the hydrography seemed to lead us towards a discussion of creating a database to house the same information. We could not resolve all of the issues so we tabled the discussion of anchor points until a future revision of the framework server database.*
   C) Use the 1:100K coverage as a backbone *for the framework server* and incorporate 1:24K edits into that coverage, making edits to 1:100K lines to insure connectivity and 'correctness'. *Jack Horton discussed the framework model for the spatial data. He proposed and we agreed that the data set would start out with a snapshot of complete 1:100K coverage with kilometer measures and framework attribute structure (the attributes would not need to be populated for the 1:100K. Users would check out the 1:100K for the area they are developing 1:24K hydrography and check the 1:24K coverages back*

into the framework database with the identified ***Core Framework Attributes*** *(see below).*

3) It is up to the users to transform event tables between 1:100K and 1:24K data sets (and vice versa). Matchmeasure.aml or STEVE import/export tools can be used to transfer event data between scales.

4) IRICC will address the issue of maintaining or submitting changes to 100k. The 100k is static. There is no mechanism to currently address this issue.

5) Remove input data dependencies from SRT for conflation.

6) Develop a graphical event table editor for IRICC Core Data. REO will put together a proposal for how this might be accomplished (starting from NRIS water AV tool and StreamNet Map Objects tool).

7) Calibrate event tables rather than routes. *This procedure has been developed but needs further refinement. I believe Dave Hatfield will be working on this procedure to make it more general and robust. We need to check with Dale on the status of this tool.*

8) When entering a 'to' value in an event table that indicates the end of the stream (regardless of whether the stream might be extended) enter *9999*. *This applies only to events that are meant to go to the end of the stream regardless of changes in the underlying spatial data.*

9) When altering the course of a stream, maintain the index *(measure)*. *For example, when altering the course of a stream the indexes (measures) should remain the same on the unedited portion of the stream and original indexes (measures) should be "stretched" or "contracted" to fit over the edited portion. Another relevant example:* When extending a stream above the original headwater, maintain the index *(measures)* of the original headwater and extend the *index (measure)* to the new headwater.

10) *(moved from decisions to Helpful hints)*

11) Maintain three coverages: 1) routed streams (centerlines included) and 2) water bodies *with routed shorelines* (polygons including double-lined streams, lakes etc.), 3) water points (springs, seeps etc.). *Note: Routed shorelines are an essential element of the WA Hydrography Framework. The simplest solution for managing the framework hydrography server is to create routed shorelines for all water bodies before insertion into the database. For Oregon, these may be arbitrary routes developed just to have the routing structure. This decision has the following caveat: If there are "show stopping" problems for the FS and BLM that have not yet been identified the decision to support routed shorelines will be revisited. (Techie note: the water bodies will*

consist of 2 separate SDE layers that will be merged into 1 polygon layer with routed shorelines upon extraction.)

12) Store metadata for portions of routed features *(including shorelines)* as events. Metadata will be required for updates. Specifics and methodology will be determined during the development of the *framework server*. *This decision has the following caveat: If there are "show stopping" problems for the FS and BLM that have not yet been identified the decision to support routed shorelines will be revisited.*

13) *(Deferred)* Publicize major changes to features to notify partners in affected areas. Partners will submit polygons defining the area edited. Those will be publicized in an automated way out of the *framework server*. Users will be responsible for determining specific changes within these areas. *This will not be part of the initial framework server design. BLM has an application called GEOCom (sp?) that may assist in implementing this decision. We will wait for results from their investigation of this software before attempting to implement anything on the framework server.*

14) Ditches and other constructed features will be attributed so that they can be separated from other features.

15) *All streams will be routed.* For braided streams *and side channels*, the main stem will be assigned the LLID assigned to the rest of the stream. Each braid will have a different LLID. The characteristics will managed in the attributes.

16) The LLID for polygonal water bodies should be assigned to the *label-point in the waterbody*. A route using that LLID along the shoreline *will* be used to map shoreline events. *Islands will receive a separate LLID and the shoreline route will receive that LLID.* Washington State Hydro Framework has developed a procedure for determining the direction of the routes for shorelines and islands.

17) A centerline will be routed through the water body on the routed stream coverage. BLM has a set of procedures for doing this on their web site (or.blm.gov/gis/projects).

18) Names should be stored in event tables for the routed stream coverage. There need not be a 1 to 1 correspondence between LLID and named streams.

19) Routing *recommendations*:

- Routes will be created using the following sequence:
  1) Conflate to 100K routes. Route to the end of the stream.
  2) Route *GNIS* named streams. Route to the end of the stream.

(optional) 3) Drive streams as desired based on local knowledge and funding

4) Route the remaining streams based on longest length.

- *1:24k will match 1:100K routing decisions except where there are ``glaring routing errors'' or there are topological errors.*

20) *(not a framework decision)*

21) *(not a framework decision)*

Helpful Hints:

- To measure the length of an event use EVENTARC to create a temp coverage. Get the length from the AAT. Add the map length to the event table.

Framework attributes: (see Dan Wickwire's handout)

Objectives:

- **Completely developed model: field names, codes**

Decisions:

- **Feature type attribute.** WA minor codes will be developed heirarchially below the OR Feature Type codes. Both will be maintained in the regional framework database. Joy Denkers and Dan Wickwire will provide the heirarchially list by Oct 15th. Both codes will be character codes.

- **Field names:** Field names will be lower case and standardized between OR and WA. My recollection is that Joy Denkers agreed to attempt this an provide a document for review.

- **Codes:** Codes values will be character (lowercase, using underscore) for framework attributes (most). There are exceptions where it makes sense to code the values as numeric (e.g. stream order) and ones where numonic codes are no more comprehensible than number codes.

- **Surface expression.** The OR Surface Expression event table will be part of the framework database. This table defines the seasonality (periodicity), spatial continuity and transfer between watesheds. The latter is only for ditches and canals.

- **Unique arc attribute:** The OR Unique arc identify has been dropped.

- **GNIS name:** The gnis name will be 50 characters.

- **Accuracy measures:** The framework database will use metric accuracy measurements in meters.

- **Feature history.** The framework database will adopt the WA Feature History event table. The OR hydmodtype has been dropped. The WA Feature History table records only that something had changed not what had changed. Can that be expanded to include what had changed (including event tables)? Explanation of the delete code in the WAFeature History event table: It is there so that when an event no longer attaches to an LLID this record will indicate that the reason for the lack of coorespondence between the event and the spatial LLID.

- **Required event tables:** Required event tables will be populated for all 1:24K coverages included in the framework server. Required event tables include:

    - Entire **Feature Type event table** from OR framework (this is the basic classification of the feature)
    - Entire Feature History event table from WA framework (this describes the source and edit history of the spatial data)
    - Entire **Surface Expression event table** from OR framework (with unclassified code)

- **Other required procedures:** Existing required event data would be maintained on records that edited for other purposes.