CARIS Hydrographic Production Database (HPD)

for Inland ENC Production

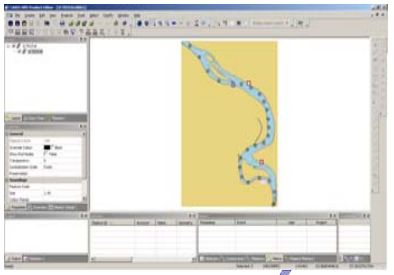
IEHG 8
September 28th – 30th 2010.
Saint Petersburg, Russia.

Eliminate redundancy in Data Management

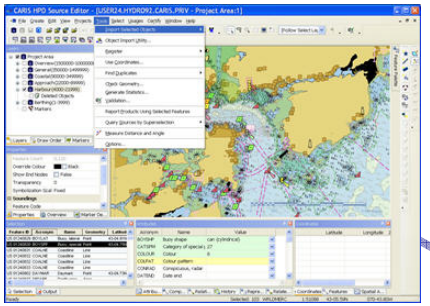
- Source & Product information in one integrated database
- Focus Production efforts on compiling in the Source data
- Automatically update products after changes are made to source
- One database feature can be represented in multiple products

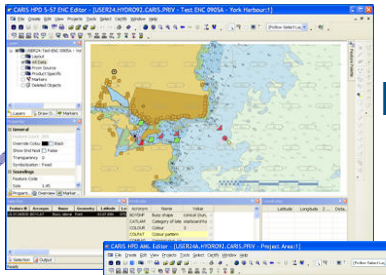
Latest Enhancements

- Oracle 11g support
- Product Editor = ENC + AML + IENC
- Export to BSB

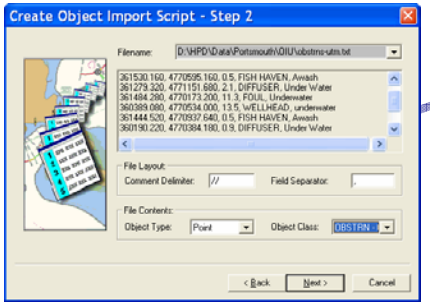


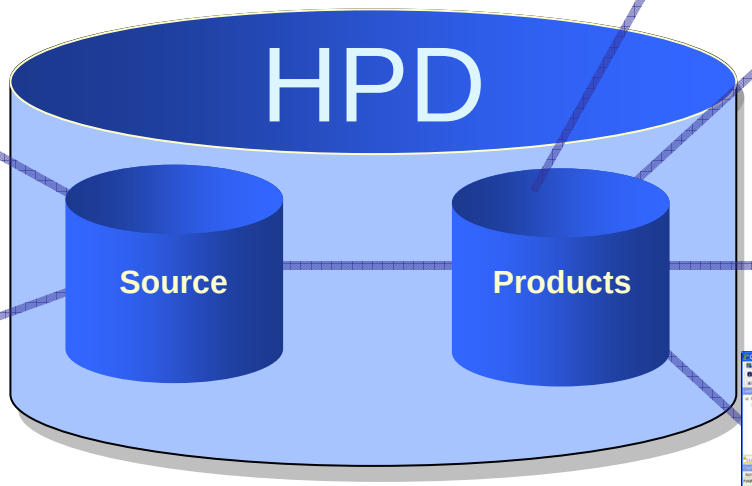
IENC

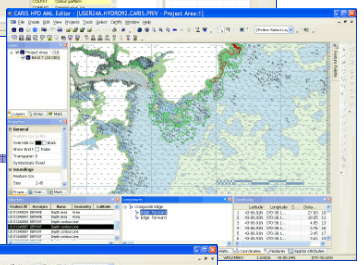




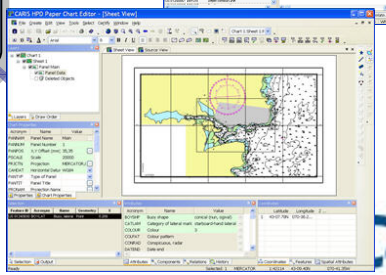
ENC







AML



Paper Int.1

RNC's

HPD Theory & Background

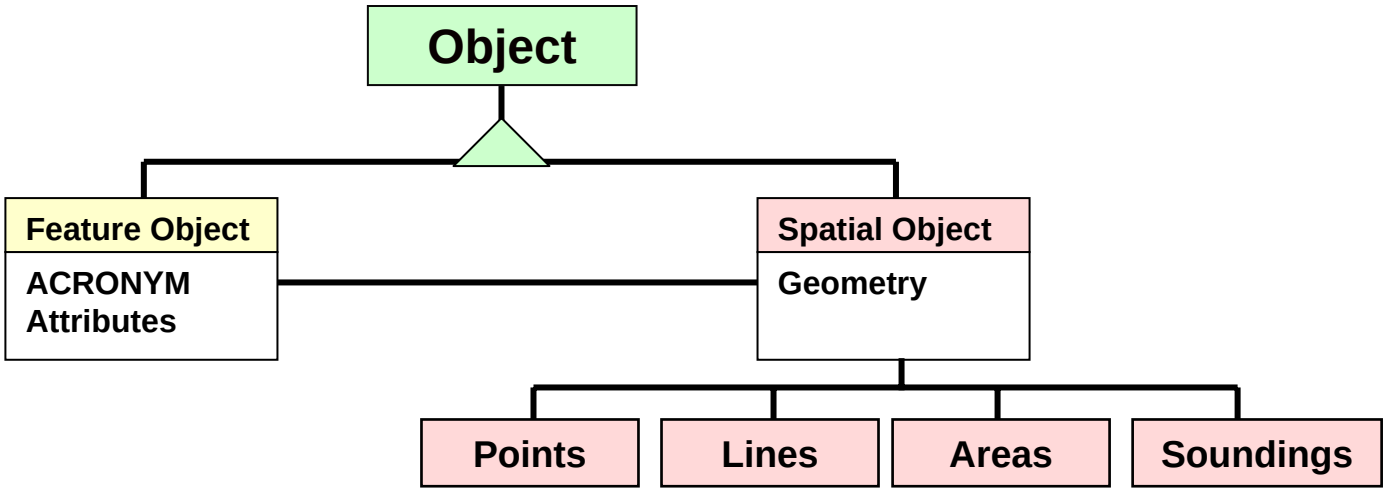
- What is CARIS HPD?
  - CARIS HPD offers a new and unique solution to managing digital hydrographic, and other, data in an innovative, efficient and integrated multi-user, seamless, database-driven environment
  - CARIS HPD allows single copies of source data features to be maintained, from which multiple product types, including S-57 Electronic Navigational Charts, can be derived and managed, at multiple different scale ranges

HPD Data Model Advantages

- HPD has adopted state of the art data models (S-57/VPF) and additions to:
  - allow a feature to have multiple representations
  - a set of spatials for each scale range on which a feature is represented
  - shared geometry means two features can reference a single geometry
  - feature generalization relationships
  - individual object lineage (history and tracking)
  - data certification and integrity
  - oracle integrity constraints, referential integrity and data security are leveraged by HPD

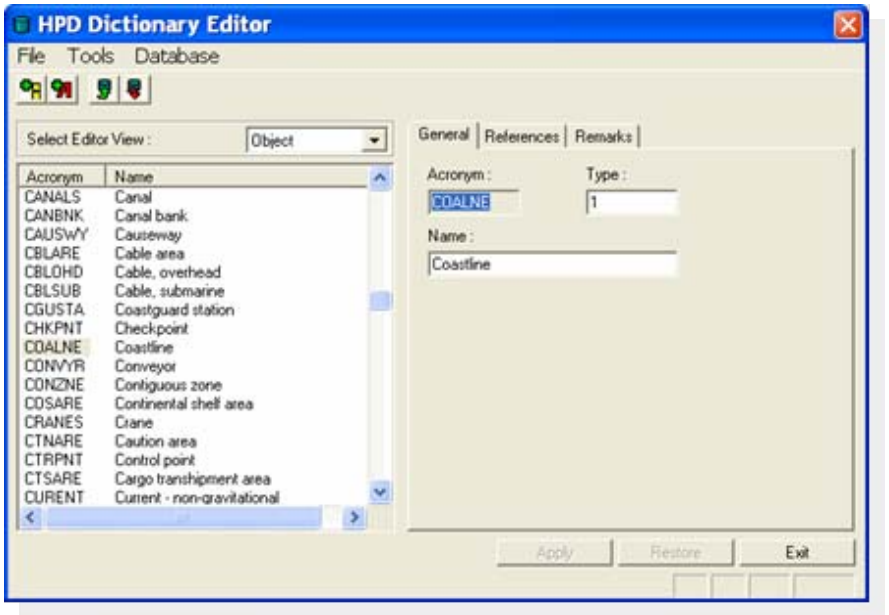
HPD Data Model

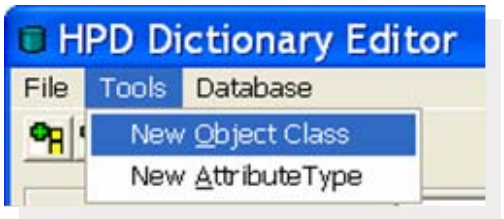
- Object oriented design based on internationally adopted S-57 and DIGEST Standards
- Stores real world entities as “objects” having a
  - “Feature object” component: descriptive information
  - “Spatial object” component: positional information



HPD Object Catalogue

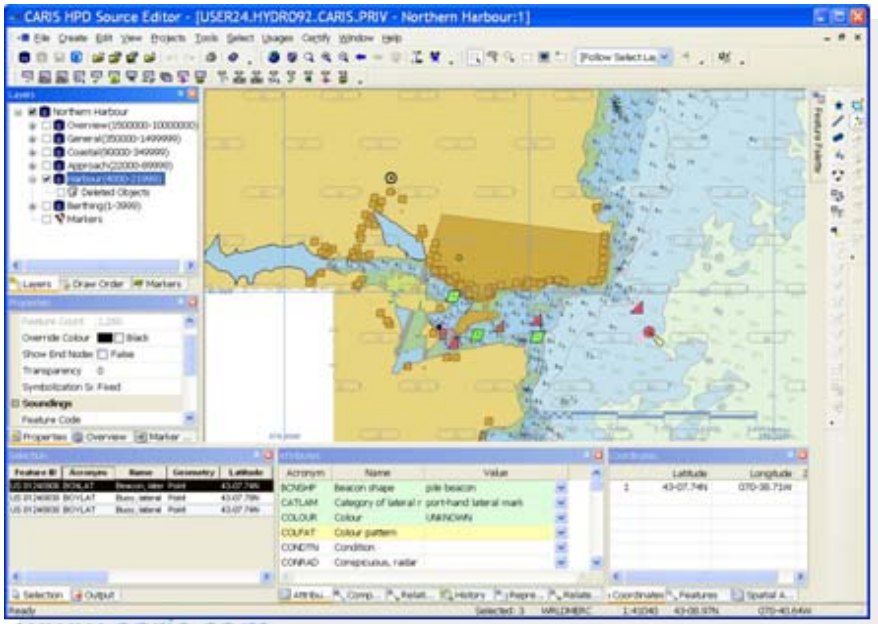
- The object model in HPD allows the dynamic addition of new objects, attributes and values
- Changing the object catalogue can be done by users without changing the software or database model

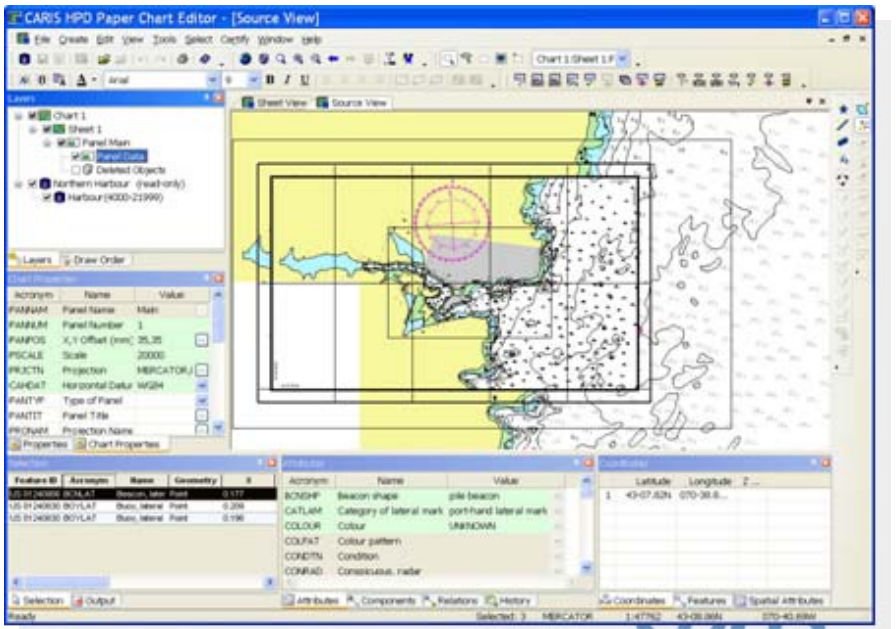




HPD Data Presentation

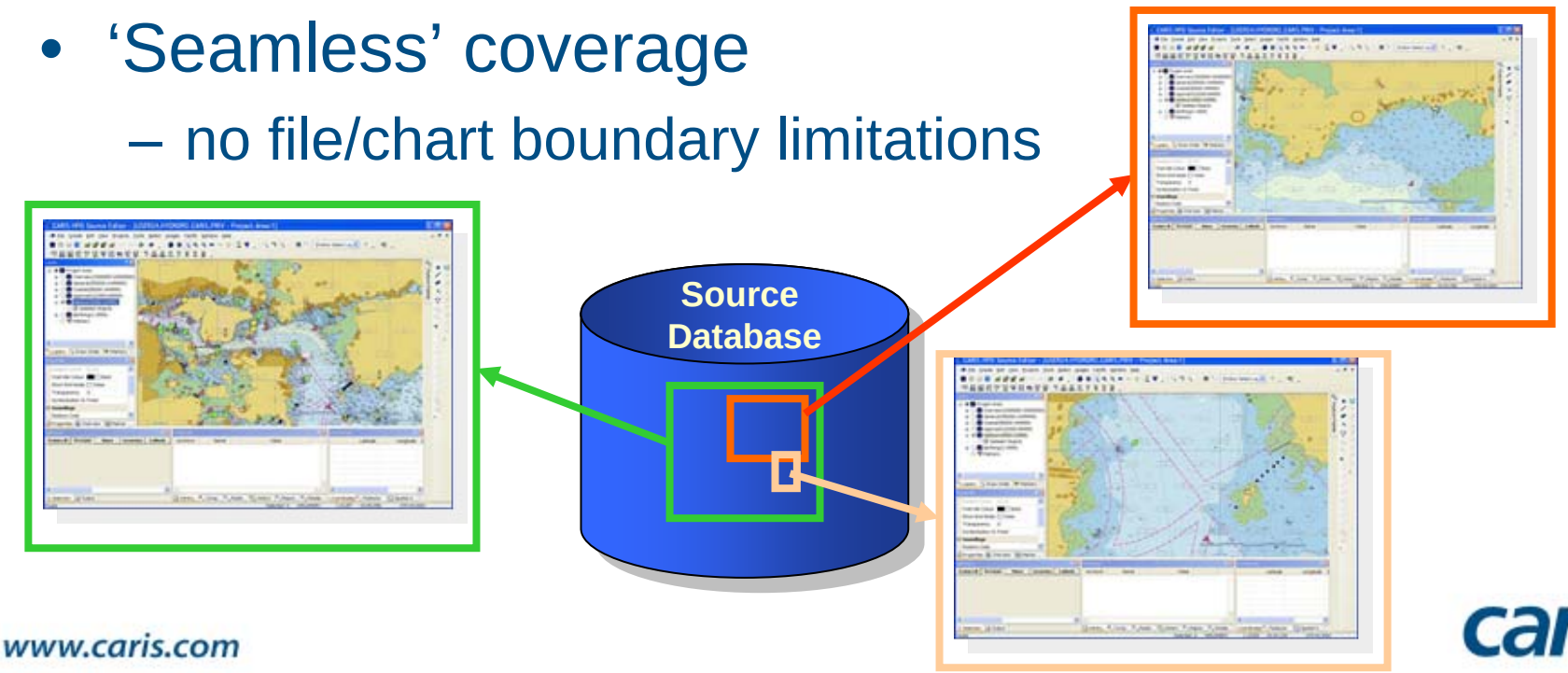
- Features display using a “Presentation Library”
  - no presentation information is stored with features
  - the presentation library is independent from the data
  - e.g. ENC Editor uses “S-52”; Paper Chart Editor uses “INT1”; etc. but both Editors access the same database





HPD Database Access & Coverage

- Access database features by a graphical interface
- Multi-user concurrent access
  - access and edit features in the same geographic area
  - individual objects are locked during editing
- ‘Seamless’ coverage
  - no file/chart boundary limitations

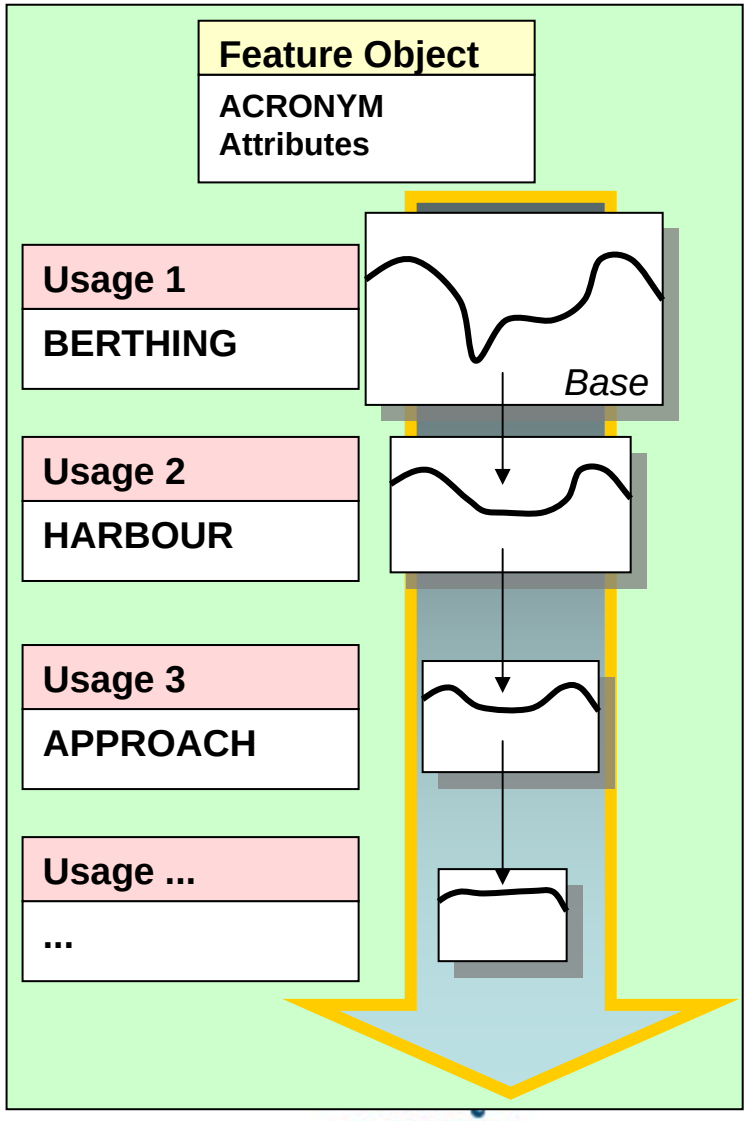


HPD Features Storage

- Eliminates the need to store duplicate features
  - features are not copied, but multiple persistent cartographic “Representations” of a feature can exist
  - spatial objects are shared between related features
- Multiple representations
  - define according to client specifications, e.g. to maintain multiple scales
  - each new representation is associated with a “Usage”
  - edits to one representation notify representations on other usages for potential editing/updating
- Usages are typically associated with scale bands

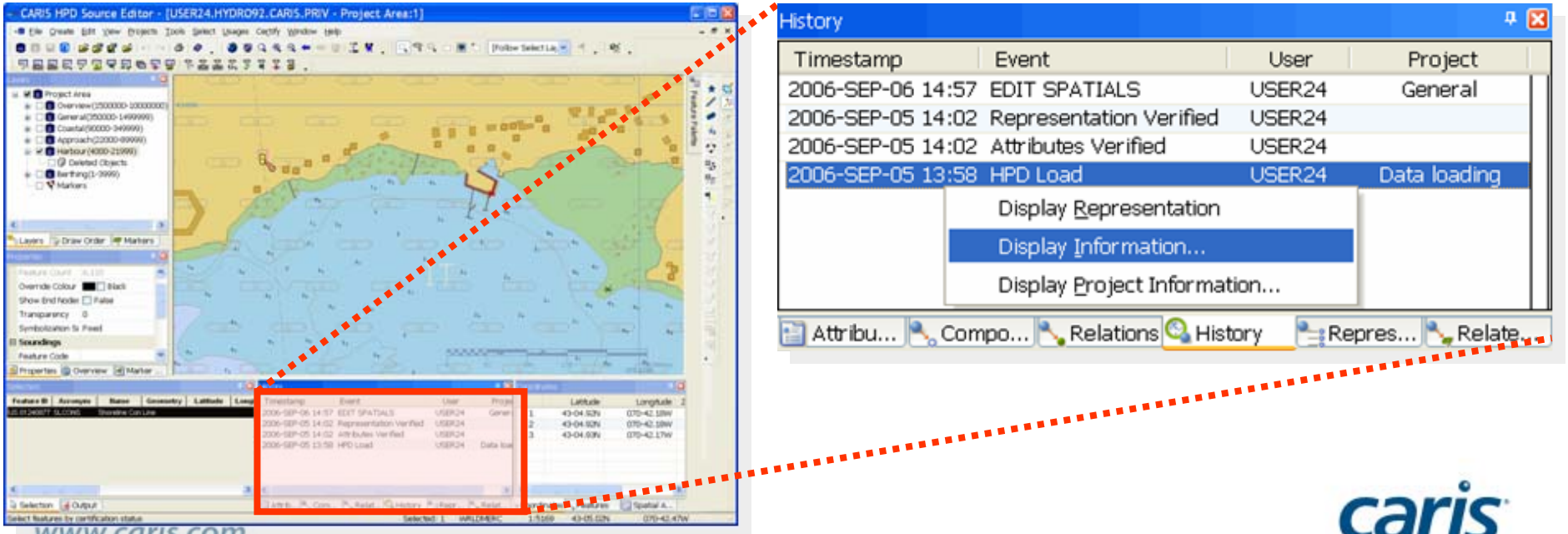
HPD Usages

- HPD uses the S-57 scheme for defining its default usages
  - Berthing, Harbour, Approach, Coastal, General and Overview
  - IENC Usages: River, River harbour, River berthing, Overlay.
- When a feature has multiple representations, the usage with the best/most accurate geometry is the “base usage”
  - this may not always be the largest scale usage available



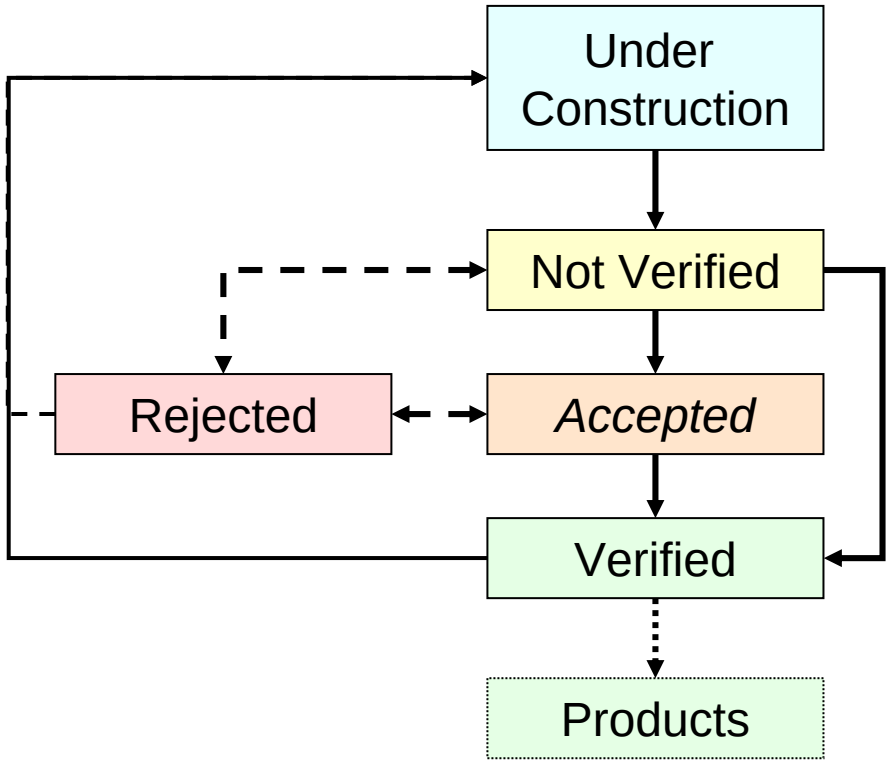
HPD Feature Change Tracking

- Feature history tracking
  - History of changes to all features is tracked
  - All changes are stored: spatial, attribute, relational, ...
  - Changes include associated user and project names
  - Deleted objects are *not* removed from the database



HPD Feature Certification

- All HPD features have a certification status, used to track changes, and in quality assurance
  - "Roles" control what functions a user can perform



Feature being added, or edited

Feature submitted, ready for QC

One or *optionally* two levels of QC checking

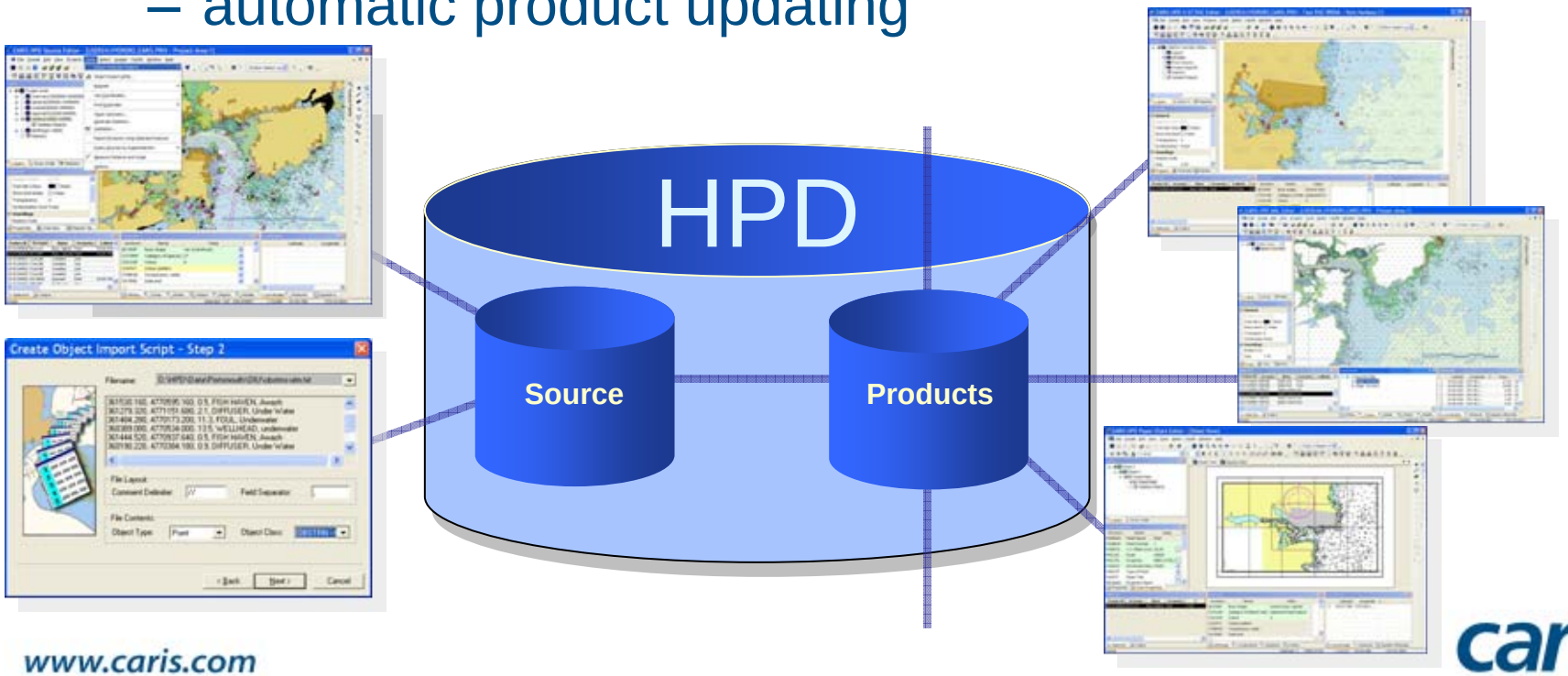
Editor Role

QA Role

Product Role

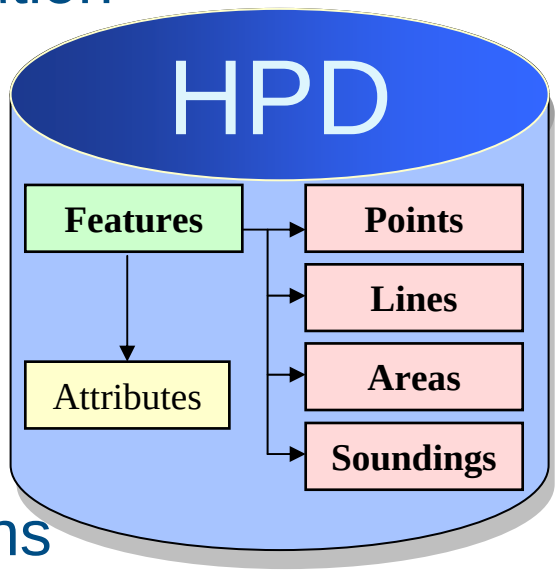
Source & Product Data in an HPD Database

- HPD databases contain source and product information in one integrated database solution
  - one feature can be represented in multiple products
  - update features in the source only once
  - automatic product updating



HPD Data Storage

- All data – geometry and attributes – is stored and maintained in Oracle
  - world's leading database management solution
  - HPD uses no special data structures
  - client-server environment
  - multi-user data access
  - security and access to tasks and data
  - separation of data from presentation
  - separation of data from software applications
  - can use Oracle backup and restore capabilities
- No suites of separate data files to manage



www.caris.com

caris