Overview of the Spatial Data Standards for Facilities, Infrastructure, and Environment (SDSFIE)

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Geodatabase Committee Meeting

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What are the Spatial Data Standards?

- An implementation of Federal Geographic Data Committee (FGDC) standards

- A national standard recommended by the National Committee for Information Technology Standards (NCITS)

- Adherence to Executive Order 12906 requiring Federal agencies to collect "geospatial data…in a manner that meets all relevant standards".

- Required for much of Federal government's spatial data

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The Spatial Data Standards, cont.

- Spatial data classification for ESRI data, as well as Intergraph, Bentley, and Autodesk
- Multi-thematic data model for facilities, infrastructure, and environmental subject matter
- A database schema that conforms to RDBMS concepts, but is *nonproprietary*--common commercial RDBMS software is supported:
  - Access, Oracle, SQL Server, Informix

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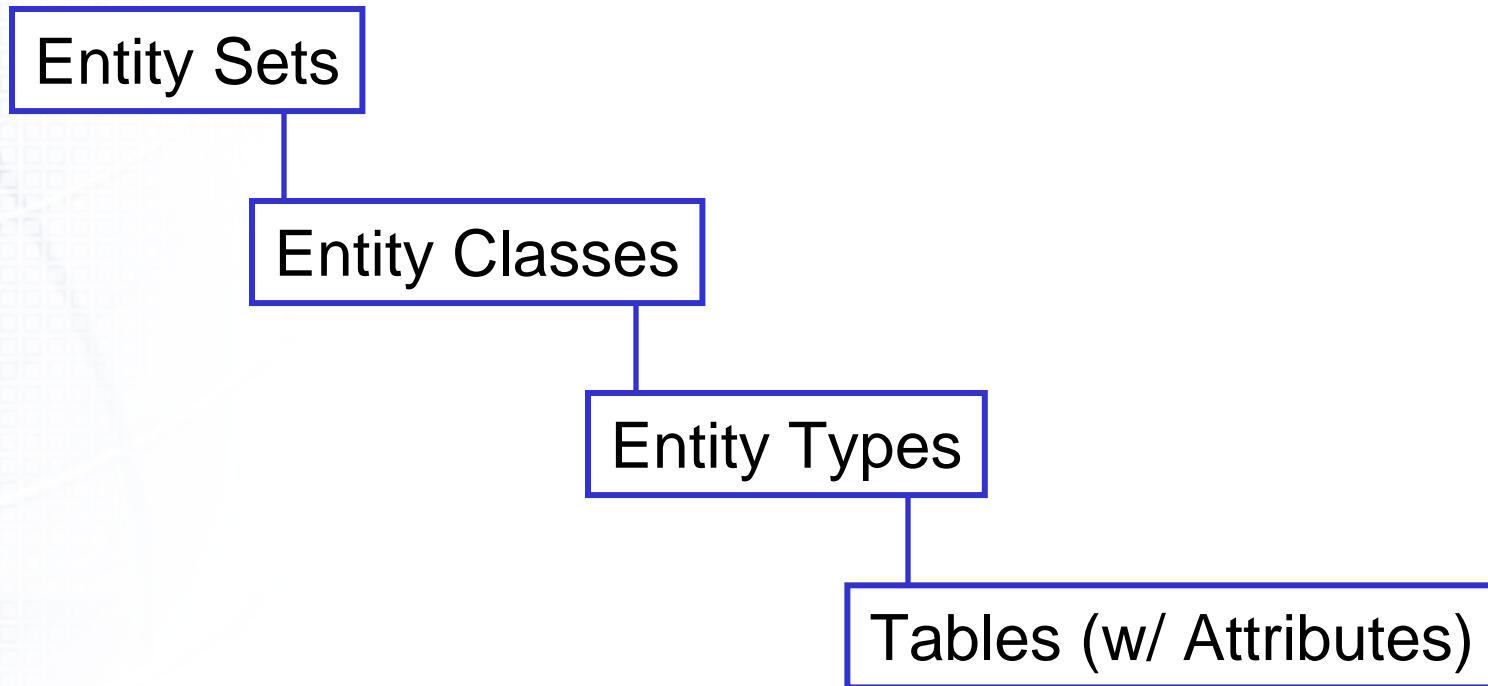**Data Management for a Changing World**

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The CADD/GIS Technology Center

- Established by the US Army Corps of Engineers at the Waterways Experiment Station in 1987

- A consortium of government and industry partners concerned with the creation and adoption of recognized standards

- A clearinghouse for CADD and GIS software and hardware issues

- Work to seamlessly integrate CADD and GIS

https://tsc.wes.army.mil/default.asp

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SDSFIE Organization

Entity Sets

Entity Classes

Entity Types

Tables (w/ Attributes)

- SDSFIE data are grouped in a hierarchical structure to allow drilldown from common entities to detailed subject matter

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Entity Sets – The Place to Start

- 26 Entity Sets reflect distinct themes within SDSFIE (designated with a two-letter code):

auditory	ecology	land_status
boundary	environmental_hazards	landform
buildings	fauna	military_operations
cadastre	flora	olfactory
climate	future_projects	soil
common	geodetic	transportation
communications	geology	utilities
cultural	hydrography	visual
demographics	improvement	

- From here, drill down to Entity Classes

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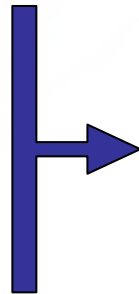Data Management for a Changing World

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Entity Classes

- Logical thematic groupings (one or more) within each Entity Set (designated with three-letter code plus two letters of the Entity Set)

Entity Set

boundary
(bd)

Entity Classes

boundary_disaster_preparedness (bddis)
boundary_economic (bdeco)
boundary_jurisdiction (bdjur)
boundary_public_safety (bdpub)

Entity Types

- Correspond to a *graphical* Entity Class; usually a single map layer (i.e. feature class, shapefile, etc.)
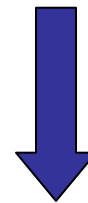
Entity Set

boundary
(bd)

➡️

Entity Class

boundary_disaster_preparedness
(bddis)

⬇️

Entity Types

evacuation_route_line
force_protection_site
shelter_site

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SDSFIE Tables

Entity Type
evacuation_route_line
(bddiseva)

→

bddiseva attributes

datalink
evroute_id
map_id
meta_id
media_id
coord_id
frcoord_x
frcoord_y
frcoord_z
tocoord_x
tocoord_y
tocoord_z
buildng_id
rd_seg_id
grid_value
instln_id
facil_id
user_flag
geocode_id
road_cl_d

- Tables contain attributes or fields for specific Entity Type/GIS layer
- Tables are linked in hierarchical RDBMS schema (structure) via Primary and Foreign Keys
- Designated with eight-letter code (short name)

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Domain Tables

- Constrain attributes to allowable values for classes, materials, methods, etc.
- Domains are either *Lists* or *Ranges* of values
- Identified by "_d" suffix

Attribute

Road_cl_d

Domain Table d_routyp

INTERSTATE

US_HWY

STATE

COUNTY

OTHER

PRIVATE

UNKNOWN

LOCAL

FEDERAL

INTERSTATE_BL

INTERSTATE_BS

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The SDSFIE Toolbox

- SDSFIE tools are (free) stand-alone software applications installed from downloadable .exe
  - SDSFIE Browsers
  - Filter Maker
  - Filter Eraser
  - Generator tools
  - Geodatabase tools

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SDSFIE Browser/Browser Lite

- New releases are issued once or twice per year
- Stand-alone Visual Basic applications run on Windows 98/2000/NT/ME/XP operating systems
- Organize and present to the user all aspects of the SDSFIE schema
- Provide a method to drill down to desired tables and examine attributes

The primary SDSFIE tools

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SDSFIE Filter Maker and Eraser

- Filters limit the entire SDSFIE schema to a subset of selected tables (and subjects)

- MAKE custom filters; share with other users to replicate the chosen schema

- ERASE unwanted filters from the Browser filter selection

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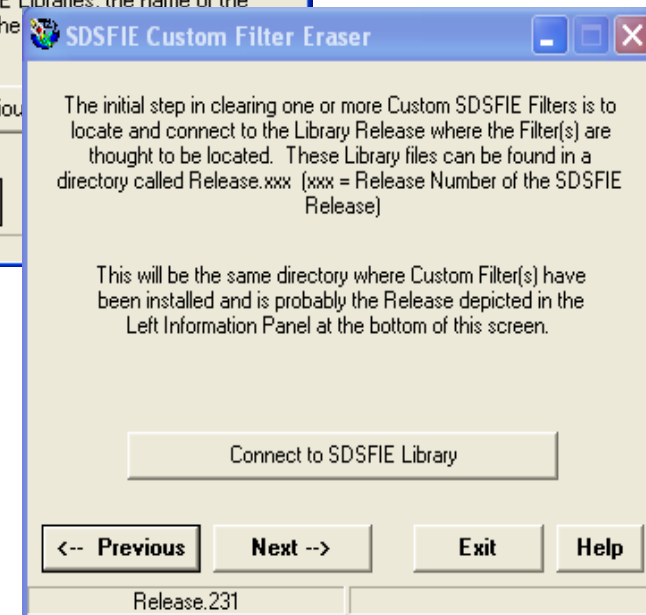
SDSFIE Generator/Builder Tools

- Allow users to generate or update SDSFIE-compliant database schema

- Permit user configuration--require a knowledge of SDSFIE structures

- Tools apply to a particular database:
  - SQL Generator tool = Oracle, Informix, SQLServer
  - Access Builder = Access databases
  - Geodatabase Builder = ESRI Geodatabases
  - GeoMedia Builder = Intergraph warehouses

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SDSFIE Generator Tools, cont.

- SQL Generator creates the SQL scripts (text files) needed to build, examine, and update Oracle, Informix, and SQLServer databases

- Access Builder connects to and reads or updates an Access database (i.e., no SQL script is created first to build the database)

- Geodatabase Builder can open an enterprise ArcSDE connection or a personal (Access) geodatabase

Geodatabase Loader

- Automates loading of data from coverages, shapefiles, and geodatabases to SDSFIE geodatabase (personal or ArcSDE)

- Map existing attribute fields to matching SDSFIE attributes

- Allows creation of feature-level metadata

- Generates log file of data loading transactions

- Provides validation of data -- will not load mismatched data or geometry types

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SDSFIE Pros and Cons

- Schema subject matters are very broad, though not always deep

- Available tools, training, and expertise support users—SDSFIE implementation can be complex

- Adhering to one standard facilitates data sharing-who are your most likely data partners and what are their standards?

- SDSFIE constructed (cobbled together?) with contributions from many users; the majority will not be applicable to any one implementation

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