ArcSDE

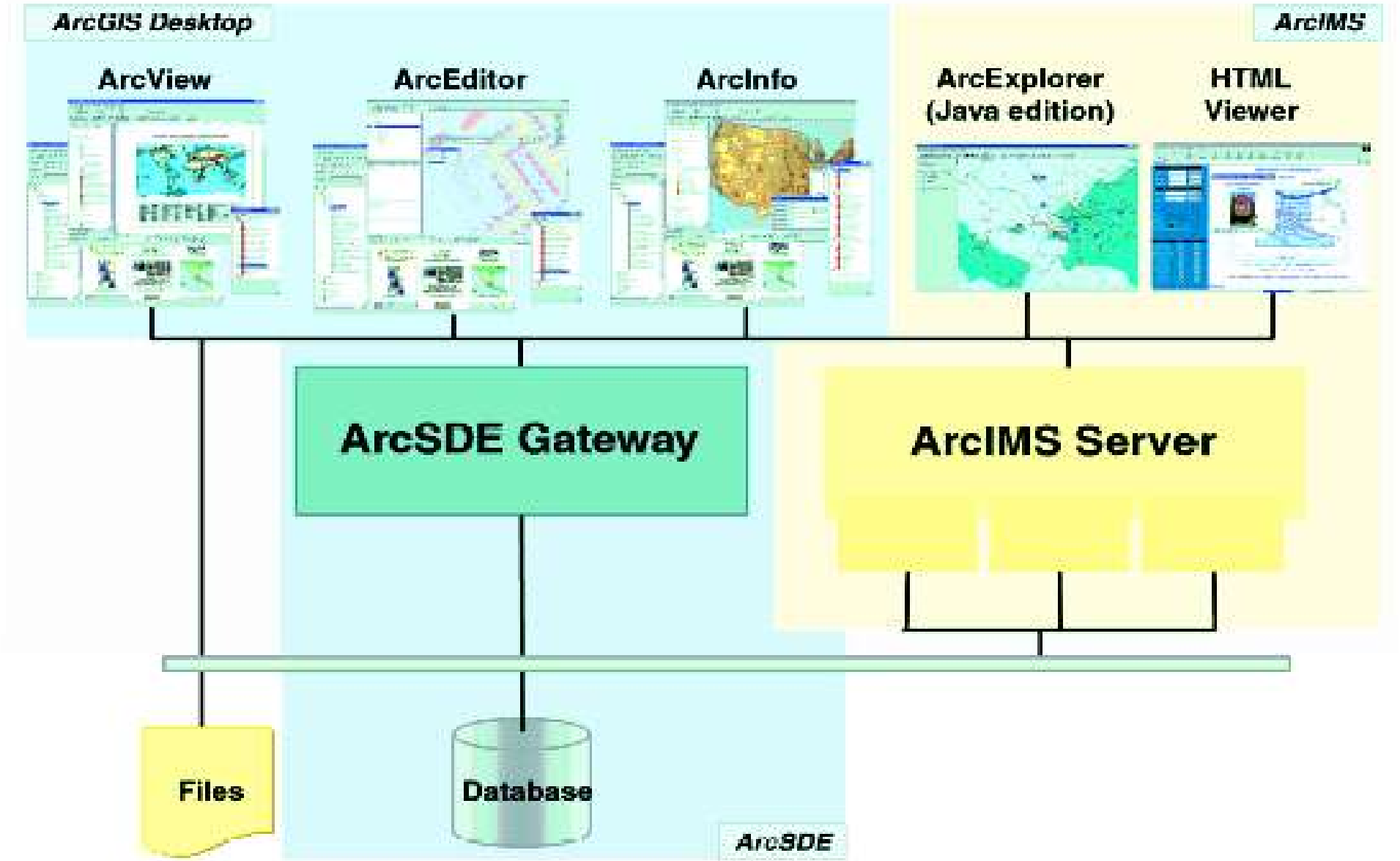
Geospatial Data Services Group, NGDC

What is ArcSDE

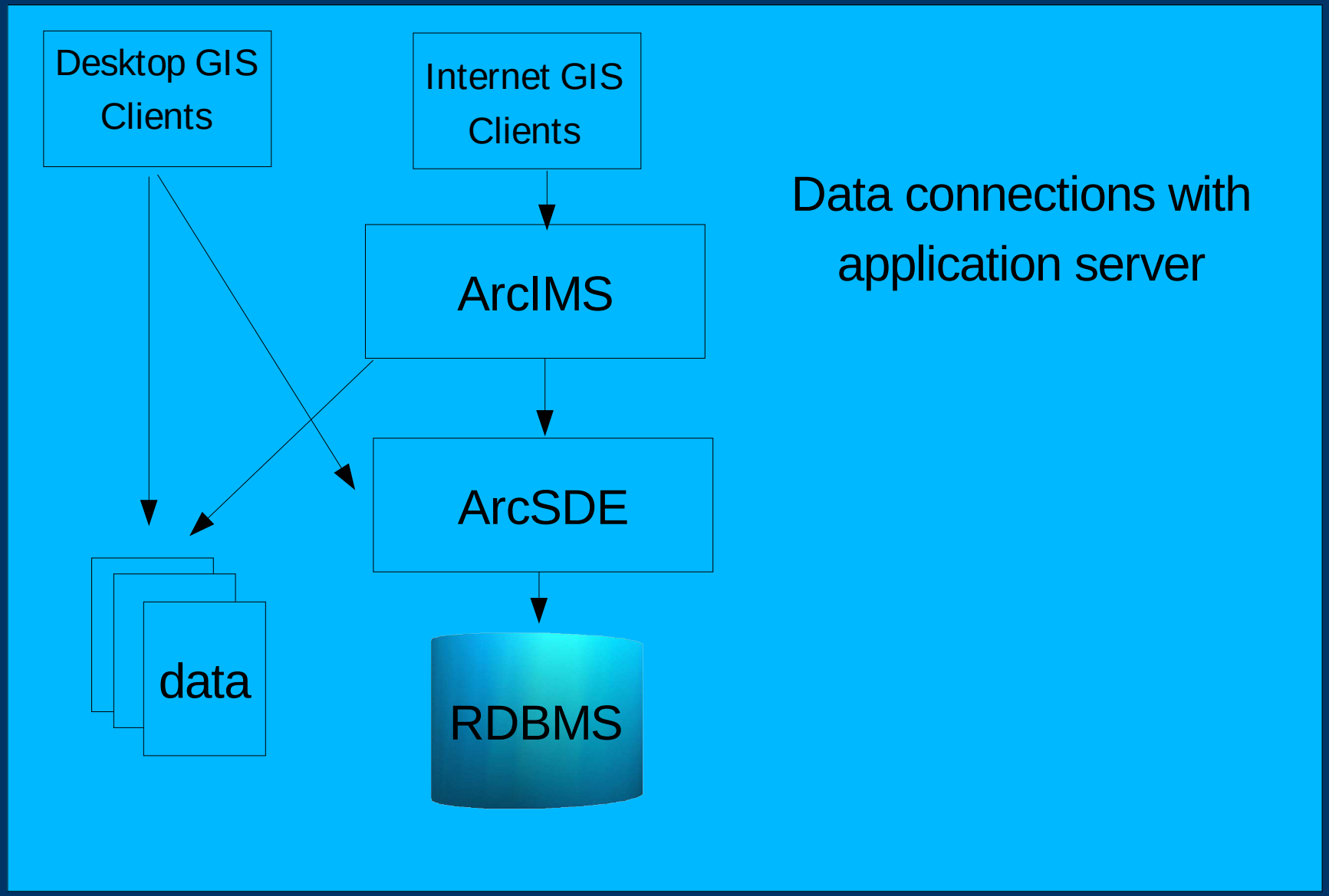
- GIS “ gateway” to RDBMS
- Application or middleware that sits on top of Database
- Provide a consistent API to variety of underlying databases

Strictly speaking, one does not store data “ in” ArcSDE, but uses ArcSDE to store/retrieve in the database

ArcGIS System



taken from " Understanding ArcSDE" by ESRI



Data connections with application server

Storage Types – SDE Binary

- “ traditional” storage scheme – does not require spatial extensions in database
- ESRI-specific, requires SDE to access the data
- In addition to the business table, adds tables for geometry and spatial index
- Uses grid-based spatial index

arguably better supported by ESRI clients

Storage Types - SDO_Geometry

- Oracle Spatial native format
- Spatial queries can be executed via SQL (no GUI, nor ESRI product required)
- ESRI products cannot directly use data
- Single table with each row representing a single geographic feature
- Uses RTree spatial index
- Easy to add/remove individual features (i.e. rows) without disrupting overlying services

Oracle Spatial extends database by adding spatial types and operators

SDO_Geometry and ArcSDE

- load shapefile into database with ArcCatalog, shp2sde
  - GEOMETRY_STORAGE setting in dbtune table
- Create/load table in oracle
  - Populate spatial column with geometry objects
  - Insert Oracle Spatial metadata
  - Create spatial index
  - Register with SDE

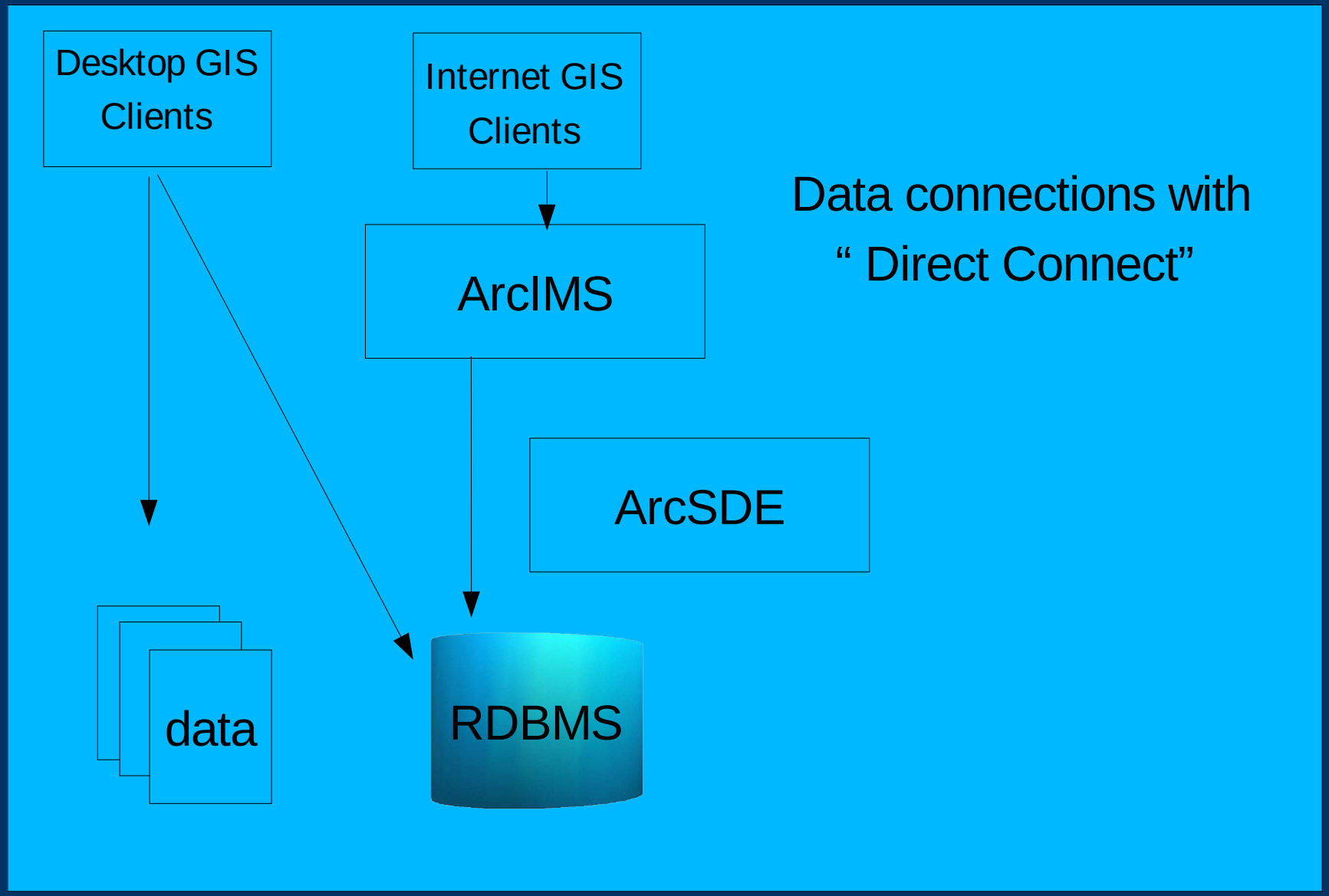
Spatial data are now available to SQL queries and ESRI clients

Spatial Cookbook Example

given an existing table in Oracle containing columns "LONGITUDE" AND "LATITUDE":

- add the OBJECTID,geometry columns to the table
- populate the newly-created columns
- populate the Oracle Spatial metadata for this table. Insert a record into USER_SDO_GEOM_METADATA.
- create a spatial index on the geometry column
- (optional) validate the geometry in the table
- register the table with SDE

More examples and detail in GDSG Spatial Cookbook
(http://map.ngdc.noaa.gov/spatial_cookbook.html)



Data connections with
“ Direct Connect”

Gotchas

- SDE layers vs. feature classes
- SRIDs different in Oracle and ESRI
- SRID in DBTUNE section overrides info specified in ArcCatalog dialogs
- Oracle allows multiple feature types in a single table, ESRI does not
- Multiple spatial columns in single table not supported
- SDE auto-registration
- Altering schema of table may disrupt overlying services, altering content does not
- Oracle spatial tables cannot be copied with ArcCatalog
- Problems querying geodetic data using polygons > ½ earth's surface

Rasters in ArcSDE

- Rasters are not handled natively in Oracle – ArcSDE must be used
- GUI and command-line tools provided
- Series of pyramids used to speed display
- Image catalogs (defined collections of individual rasters)
- Support very large continuous images

More examples and detail in GDSG Raster Cookbook
(http://map.ngdc.noaa.gov/raster_cookbook.html)