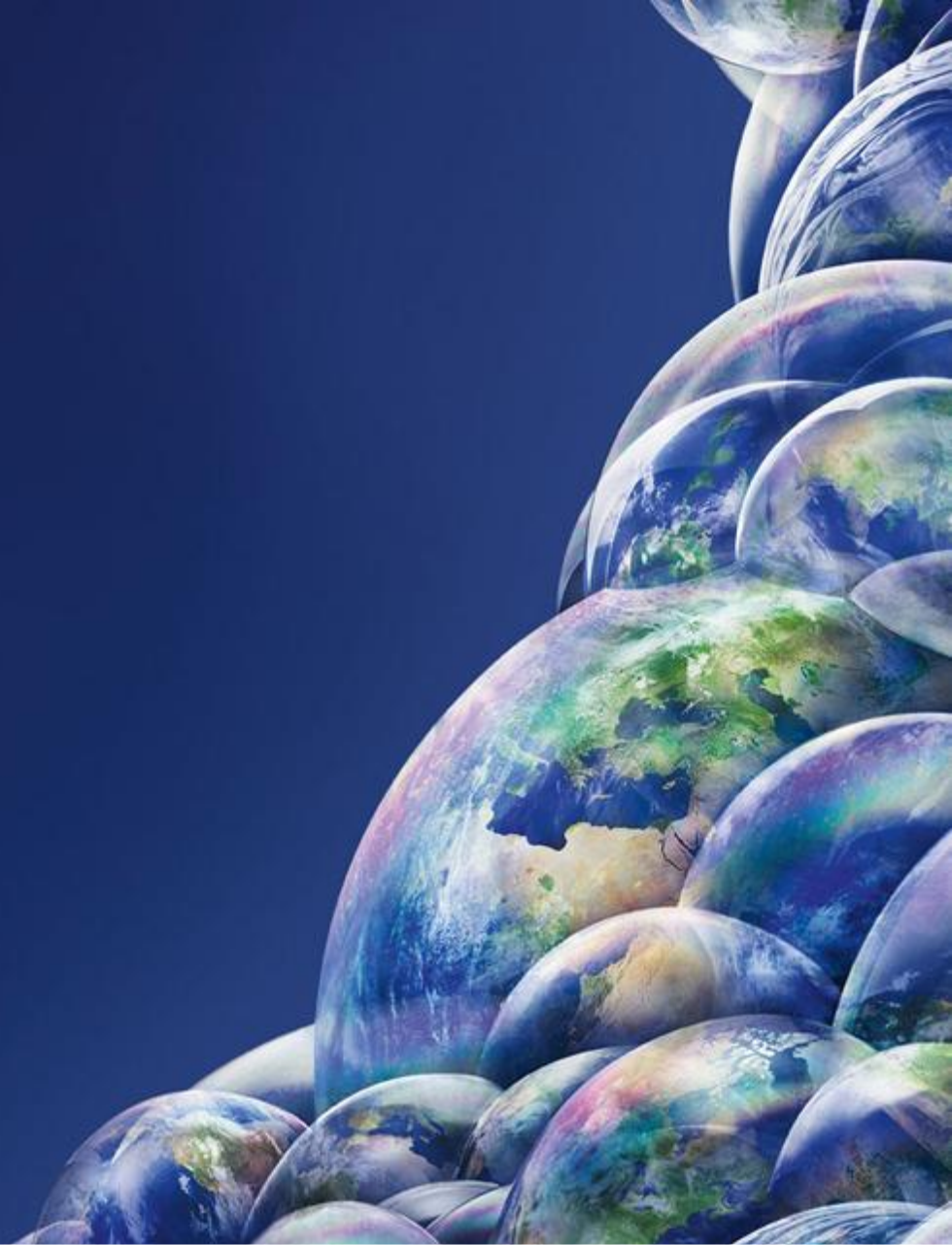


Esri Datenmodellierung

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Esri Deutschland GmbH

7. Mai 2014, Bern



Agenda 09:40-11:30

+ **Das Esri Framework für Geodaten**

- > Unterstützte Datenformate
- > Esri Database Framework
- > Esri Geodatabase Framework
- > Änderungen in 10.2
- > Hilfswerkzeuge der Modellierung

+ **Der Esri Modellierungsprozess**

- > Ausgangsparameter
- > Database Design
- > Finalisierung

+ **Zeit für Fragen und Diskussion**



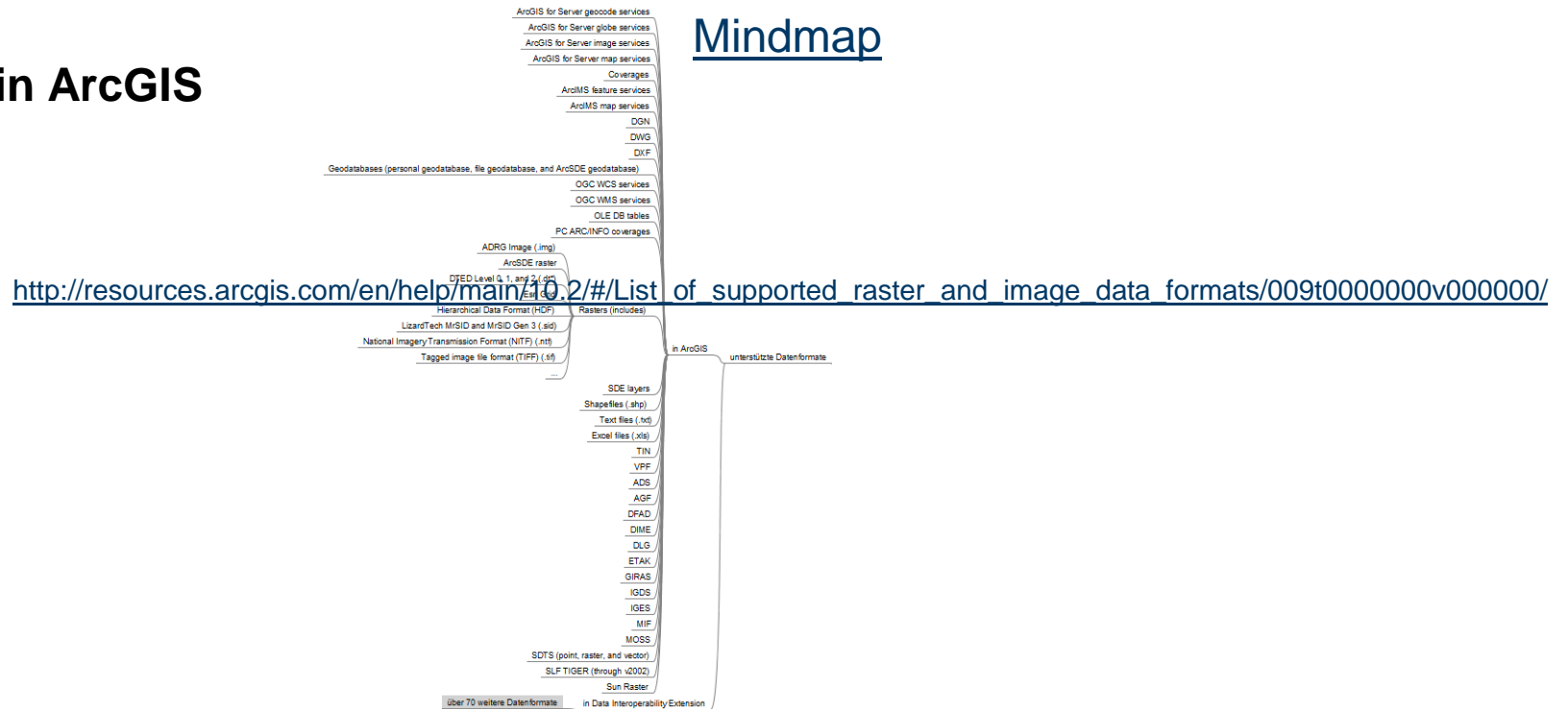
**Das Esri
Framework für
Geodaten**



Unterstützte Datenformate

+ in ArcGIS

Mindmap





Unterstützte Datenformate

+ in ArcGIS Data Interoperability Extension

Description	Short Name	Extensions	Type	Coord. Sys.	Licensed
1Spatial Internal Feature Format (IFF)	IFF	.iff	File/Directory	*	*
Aeronautical Information Exchange Model (ADXM)	ADXM	.xml	File extension associated with the format	*	*
Australian Asset Design & As Constructed (ADAC)	ADAC	.xml	File	*	*
Autodesk AutoCAD DWF	DWF	.dwf	File	*	*
Autodesk AutoCAD DWG/DXF	ACAD	.dwt, .dwg	File	*	*
Autodesk MapGuide SDL	SDL	.sdl	File/Directory	*	*
B.C. MOEP	MOEP	.arc_bin	File/Directory	*	*
BC MoF Electronic Submission Framework - ESF	ESF	.gml, .xml, .gz	File	*	*
Bentley MicroStation Design (V7)	IGDS	.pos, .fcl, .dgn	File	*	*
Bentley MicroStation Design (V8)	DGNV8	.pos, .fcl, .dgn	File	*	*
Bentley MicroStation GeoGraphics	GG	.cad, .dgn	File	*	*
CITS Data Transfer Format (QLF)	QLF	.csv, .gz, .qif, .qif.gz, .csv, .gz	File	*	*
CityGML	CITYGML	.gml, .xml, .gz	File	*	*
Collaborative Design Activity (COLLADA)	COLLADA	.dae	File/Directory	*	*
ComGraphia Data Exchange Format (CDEF)	CDEF	.cdef	File	*	*
Comma Separated Value (CSV)	CSV	.csv, .gz	File/Directory	*	*
Danish DSFL	DSFL	.dsfl	File	*	*
Danish UFO	UFO	.ufo	File	*	*
dBASE (DBF)	DBF	.dbf	File/Directory	*	*
Digital Line Graph (DLG)	DLG	.opt, .dlg	File	*	*
Dutch TOP10 GML	TOP10	.gml, .xml, .gz	File	*	*
ESRI ArcGIS Layer	ARC GIS_LAYER		ESRI Layer	*	*
ESRI ArcInfo Coverage	ARCINFO	.adf	Directory	*	*
ESRI ArcInfo Export (E00)	E00	.e00	File/Directory	*	*
ESRI ArcInfo Generate	ARC GEN	.gen	File/Directory	*	*
ESRI ArcSDE	SDE30		Database	*	*
ESRI Geodatabase (ArcSDE)	GEODATABASE_SDE		Database	*	*
ESRI Geodatabase (File-based)	GEODATABASE_FILE	.gdb	Geodatabase	*	*
ESRI Geodatabase (MDB)	GEODATABASE_MDB	.mdb	File	*	*
ESRI Geodatabase (XML)	GEODATABASE_XML	.xml, .l, .zip	File	*	*
ESRI PC ArcInfo Coverage	PCARCINFO	.adf	Directory	*	*
ESRI Shape	SHAPE	.shp	File/Directory	*	*

<http://www.esri.com/software/arcgis/extensions/datainteroperability>



Modellieren ist nur dann notwendig,

- + wenn die Daten nicht in einem unterstützten Format zur Verfügung gestellt werden können**
- + wenn die Daten die notwendigen Workflows/Prozesse nicht unterstützen**
 - > Multiuser Editing
 - > Replikationen (Offline Editing)
 - > Topologie, Network Datasets



Esri Database Framework

+ Datenbanken

- > Oracle
- > SQL Server
- > IBM DB2
- > IBM Informix
- > Netezza
- > PostgreSQL
- > Teradata
- > Windows Azure SQL Database
- > SQLite



Esri Database Framework

+ Geometrie

- > Native Spatial Type
- > ST_Geometry



Esri Database Framework

+ Supported Data Types

- > Blob
- > Date
- > Double
- > Float
- > GlobalID
- > GUID
- > Long Integer
- > ObjectID
- > Raster
- > Short Integer
- > Text



Esri Geodatabase Framework

- + **Versionierung**
 - > Replikation
 - > Planungsversionen
 - > Multi-User Editierung



Esri Geodatabase Framework

+ Datasets

- > Topology
- > Network Dataset
- > Geometric Network
- > Terrain
- > Parcel Fabric



Esri Geodatabase Framework

+ **Erweiterte Featureclasses**

- > Annotations
- > Dimensions
- > Subtypes



Esri Geodatabase Framework

+ Relationships

- > Simple
- > Composite

+ Rules

- > Domains
- > Connectivity Rules
- > Relationship Rules



Esri Geodatabase Framework

- + **Personal Geodatabase (.mdb)**
- + **File Geodatabase (.gdb)**
- + **ArcSDE Geodatabase**
 - > Oracle
 - > SQL Server
 - > IBM DB2
 - > IBM Informix
 - > PostgreSQL



Änderungen in 10.2

+ Abkündigungen

- > ArcSDE C/Java API
- > ArcSDE Application Server
- > ArcSDE Commandline Tools



Änderungen in 10.2

+ Neuerungen

- > Administrations-Tools (Geoprocessing Framework)
- > Vereinfachte Installation



Hilfswerkzeuge der Modellierung

- + **ArcGIS Application Framework**
 - > ArcCatalog
- + **Geoprocessing Framework**
 - > Geoprocessing-Tools
 - Create...
 - Import/Export...
 - > ArcPy/Python
 - > Modelbuilder
- + **ArcGIS Data Interoperability Extension**

An aerial photograph of a mountain valley. The foreground and middle ground are filled with lush green fields and dense forests. In the background, a range of dark, rugged mountains stretches across the horizon under a sky with scattered clouds. A large white circle is overlaid on the left side of the image, containing the title text.

Der Esri Modellierungs prozess



Ausgangsparameter

- + **Informationsprodukte**
- + **Client-Devices**
- + **Verteilungsplattform**
- + **Prozesse**
- + **Database/Geodatabase Framework**
- + **...**



Informationsprodukte

+ Layer Definition

- > Spatial – Non Spatial
- > Geometry Types
- > Symbolik
- > Attribute



Client-Devices

+ Esri Clients

- > Esri Framework für Geodaten

+ Non Esri Clients

- > ArcObjects

- > ArcGIS Runtime SDKs

- > ArcSDE C/Java API

- > File Geodatabase API

- > SQL



Verteilungsplattform

- + **Feature-Service**

- > Simple Features (View, Edit)

- + **Database-Connect**

- > Query Layer, Query Table (View)

- + **Geodatabase-Connect**

- > Direct Connect, Application Server Connect (View, Edit)

- + **SQL**

- > Native Geometry types, Versioned Views (View, Edit)



Prozesse

- + **Editierung**
 - > Versioniert, nicht Versioniert
- + **Ableitungen**
- + **Beauskunftungen**



Geodatabase Framework

- + **Featureclass/Objectclass**
 - > ObjectID
 - > Geometry
 - > Spatial reference
 - > Supported Data Types
- + **Database Views**



Database Framework

- + **Nur unterstützte Datentypen**
- + **Nur EIN(E)**
 - > Spatial Column
 - > Geometry Type
 - > Dimensionality
 - > Spatial Reference



Design

- + **Design from Scratch**
- + **ArcGIS Data Model Design**
- + **Design Tips**



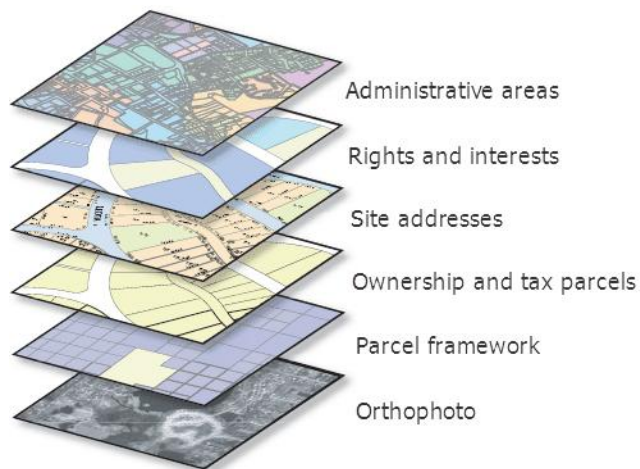
Design from Scratch: Design follows Function

- + **Leicht verständlich**
- + **Leicht implementierbar**
- + **Sollte sein**
 - > flexibel
 - > erweiterbar
 - > adaptierbar



Design from Scratch

- + „Data Themes“ (Layer) identifizieren
 - > Geometry Type (Raster, Punkte, Linien...), Attribute





Design from Scratch

- + **Layer – Featureclass (1:1)**
 - > Bodenarten
 - > Fließgewässer
- + **Layer – Featureclasses (1:n)**
 - > Transportnetze (Strassen, Kreuzungen, Brücken, Auffahrten ...)
- + **Layers – Featureclass (n:1)**
 - > Subtypes, Definition Queries



Design from Scratch

- + **Layer – Layers (1 : n)**
 - > Kataster, Topografische Karte



Design Steps

- + **(1) Identify the information products that you will create and manage with your GIS**
 - > Maps und WebMaps, Models, Reports...
- + **(2) Identify the key data themes based on your information requirements**
 - > Layer für geplanten Workflows
 - > Map Use, Data Sources, Spatial Representations for different MapScales
 - > Symbology, Labeling



Design Steps

- + **(3) Specify the scale ranges and the spatial representations of each data theme at each scale**
 - > Generalisierung, Resampling
- + **(4) Decompose each representation into one or more geographic datasets**
 - > Featureclass, Datasets



Design Steps

- + **(5) Define the tabular database structure and behavior for descriptive attributes**
 - > Attribute, Domains
- + **(6) Define the spatial behavior, spatial relationships, and integrity rules for your datasets**
 - > Networks, Topology



Design Steps

- + **(7) Propose a geodatabase design**
 - > Evtl. mit ArcGIS Data Models abgleichen
- + **(8) Design editing workflows and map display properties**
 - > Versionierung, Replikationen, Regeln, Tools
- + **(9) Assign responsibilities for building and maintaining each data layer**
 - > Import, Update etc.
 - > Archivierung



Design Steps

- + **(10) Build a working prototype. Review and refine your design**
 - > funktional testen (auch mal mit größeren Datenmengen)
- + **(11) Document your geodatabase design**
 - > z.B. Geodatabase Diagrammer

<http://www.arcgis.com/home/item.html?id=a378b48be11b45b5bb25254643304cb7>



ArcGIS Data Model Design

+ Geodatabase Data Model Templates

<http://support.esri.com/en/knowledgebase/techarticles/detail/40585>

> Templates

> Dokumentationen

jump-start your design



ArcGIS Data Model Design

- + **(1) Download Data Model from Esri Support Center**
- + **(2) Create an empty File Geodatabase**
- + **(3) Import the Schema**
- + **(4) Set up Spatial Reference for the content**
- + **(5) Load some Data**
- + **(6) Test and Refine the Design**



Design Tips

- + **(1) Build on your existing GIS designs**
- + **(2) Use generic geodatabase types whenever feasible**
- + **(3) Integrate related feature classes using topology**
- + **(4) Combine GIS design concepts from this section with traditional relational database design methods**
- + **(5) Prototype and pilot your geodatabase design**



Finalisierung

- + **Storage Management (DBTUNE Keywords)**
- + **Benutzer- und Rollenberechtigungen**
 - > Datenbank Nutzer
 - > Operating System Nutzer
- + **Indices**
 - > Spatial Index
 - > Attribute Index
- + **Statistiken, Reconcile/Post, Compress**
 - > Python



**Zeit für Fragen
und
Diskussion**