CIAT

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DSS, models and GIS: facts and thoughts.

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The typical model

- Complex: does one job well
- Programming language can be anything
- Interface can be anything
- Thousands of models available, many very interesting, but generally not in the programming language that we want
- Some confusion between a DSS and a model
- An example: DSSAT

The typical DSS

- Prescriptive
- Complex, try to simulates reality.
- Anticipates the tasks
- Not adaptive except at high cost
- Some confusion between DSS and a bunch of linked biophysical models (and expert systems if we are lucky)
- An example: WaterWare water resources management and information system.

The typical GIS

- Not for the non-technical
- Scripting language
- Now: Spatial objects libraries
- GIS is the center of the world
- "GIS is a DSS" - yes but seeing is not the only thing
- An example: ArcView

The new DSS: a suite of models*

MODEL FOR:	CIAT EQUIVALENT:
Representation	Cross Scale, Virtual Reality
Process	Influence Diagrams, hydrolog
Evaluation	Optimization, Fuzzy Logics
Change	Land Use Models
Impact	Indicators
Decision	Habanero

*Steinitz, 1993

Examples: integration of GIS and decision making

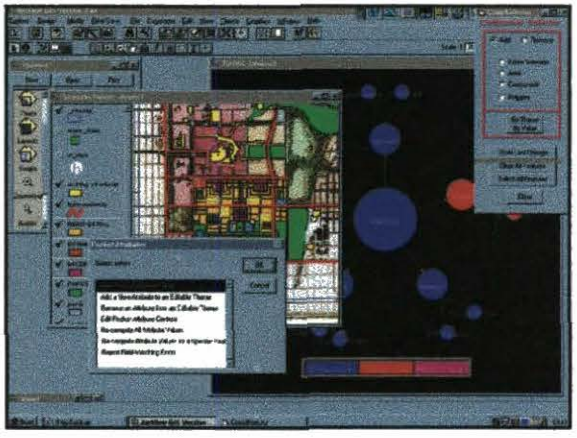
- Smart Places - GIS central, Avenue programming only.
- EMDS - GIS central, Avenue programming, links to external NetWeaver
- IDRISI - a complete GIS, MC/MOLA
- E911 dispatcher (Avenue)
- Business Analyst (MO/Avenue)

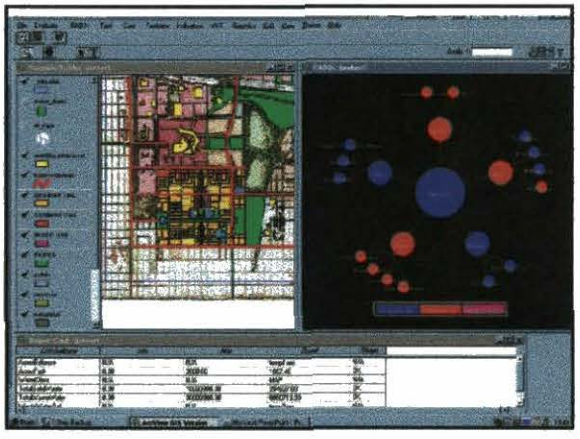
In all cases, we have:

- Central database
- GIS expert as facilitator
- Group discussions
- Scripting language (facilitates development it seems)
- Tutorials
- Tech support

CIESIN's SmartPlaces

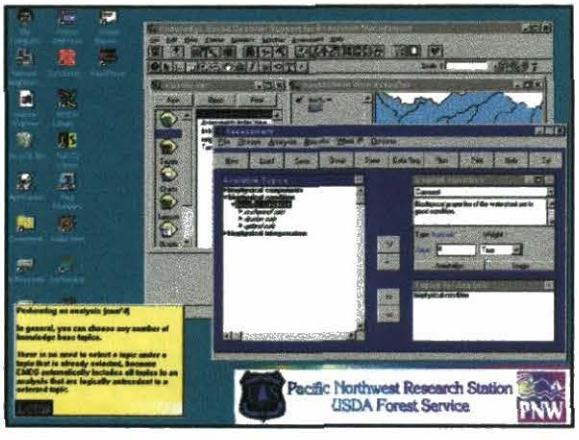
- Uses functions in AR/GIS AV extensions
- Database development include GIS layers and "Pocket attributes"
- Evaluation consists in running summary statistics, regressions, and buffers (can be expanded as needed)
- Snap-on groupware available
- Needs administrator

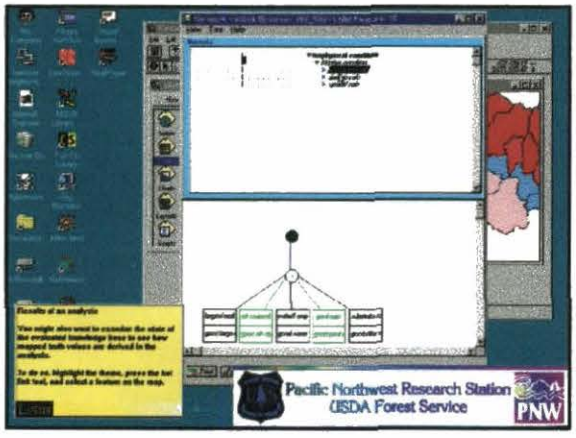


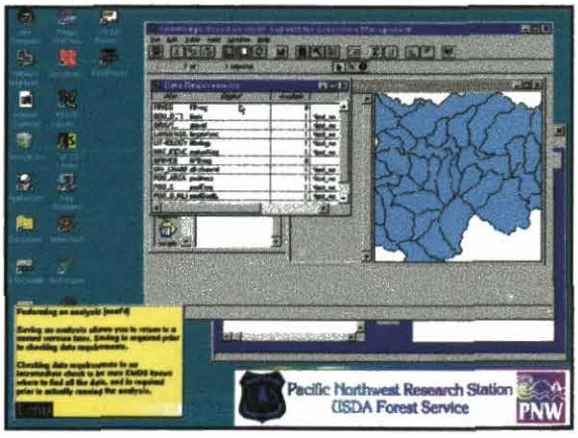


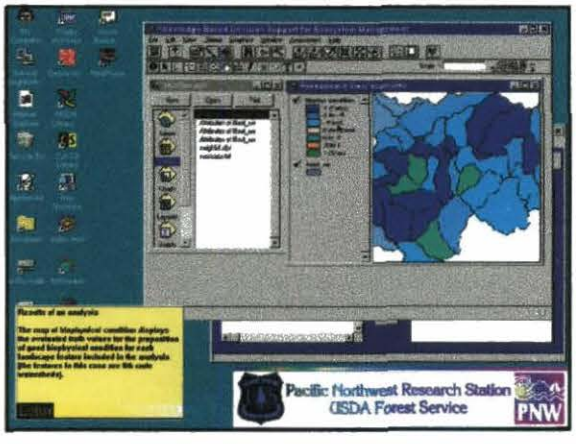
USFS EMDS

- All Avenue scripts
- Links to NetWeaver fuzzy logics software: empirical/knowledge models that grow
- GIS is used to select Area of interest, for querying data/verify data availability and display results









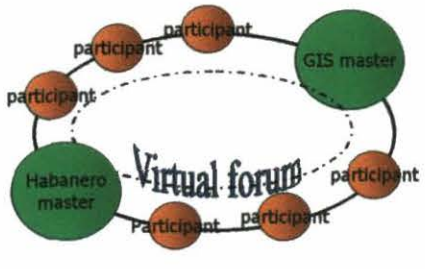
A reality check: GIS in Latin America

- GIS is for tecno-elite
- Training has to be intensive
- Learning curve is very flat
- Data is not available/shared
- Many software packages (usually free or through project)
- National Universities have few resources
- ESRI is the leader

Internet access to the public sector in Latin America

- National level organizations, Municipio and NGOs have computers
- Some schools have computers (the rich ones)
- Modem connection is very bad in the countryside (when there is electricity)
- Internet is becoming popular
- A solution CIAT is working on: Rural Telecenters

A scheme which can work for now



Role of the masters

HABANERO MASTER(s):
- Facilitate
- Stimulate participation
- Monitor/reports
- Train/debug/orient
- Summarize
- Integrate documents
- provides www Links

GIS MASTER(s):
- Obtain/Integrate data
- Know and apply models/statistics
- summarize model results (reports, graphs)
- Train
- Tech support
- www Links

Role of the participants

TO PROVIDE:
- Ideas
- Documents
- Reports
- Contacts
- www Links
- Data
- Feedback
- Informed decisions

TO OBTAIN:
- Feedback from others
- Rigorous procedure
- Information

TO GENERATE:
- Development projects
- Empowerment in the region

Technology next door

- SDO/SC/SDE/Geolink are database extensions that allow to store spatial objects.
- This eliminates the boundary between geography and databases.
- It makes the development of web-based applications straightforward.
- Models can be written in SQL.
- Who knows what's next

CIAT and the technological challenge of GIS for DSS

- Free GIS (Mapmaker) to generate interest in GIS, get people started and hooked
- ArcView/Avenue extensions (Existing and developed in-house - e.g. accessibility)
- MapObject/C++ for CDs
- Internet Map server/SDE/Geolink
- Integrate groupware, influence diagrams, fuzzy logic, scenarios, AI tools and VR

Conditions for successful development of our DSS

- Technology will change, we shall always look forward!
- We should adopt standards right now, but allow for flexibility in the design: loosely coupled system, just like the internet!
- We should allow easy links to existing models (ASCII, OLE, DLL, COM, Java Beans)

But also

- Be realistic
- Field test in various environments and obtain feedback from the participant
- Learn from previous attempts to develop DSS (literature!)
- Use whatever is available
- Team with experienced partners (e.g. CSIRO, CIESIN, USFS, CARE)