



*GIS - Integration*  
*Blood Tribe Land Use Planning GIS*  
*and FN EpiCentre GIS Tools*

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# *What is a GIS?*

- ★ GIS is a combination of hardware and software that can be used to manage resources geographically.
- ★ GIS allows analysis of relationships within the same geographic region.
- ★ GIS are often used for data integration.





# *GIS Data Integration*

- ◆ GIS has been used extensively to integrate data from different sources into a single environment.
- ◆ There are different levels of integration, as integration improves, so do the possible analysis outcomes.



# *GIS Data Integration*

- ◆ Integration can be huge challenge since it can require that all relevant records be linked within the GIS database.
- ◆ For example, a water sample has to be linked to a GIS drawing of the building where the data was collected.
- ◆ The building must be linked to the water source.





# *GIS Data Integration*

- ★ A well-designed data integration methodology will allow database records from other sources to be linked to the appropriate geographic elements.
- ★ A carefully-planned data integration strategy can result in much better analysis options from the GIS.



# *GIS Challenges*

- ◆ GIS require lots of staff and funding to fulfill their full potential but these two resources are commonly in short supply.
- ◆ Integration is especially challenging, but this should not prevent the development of any GIS application.

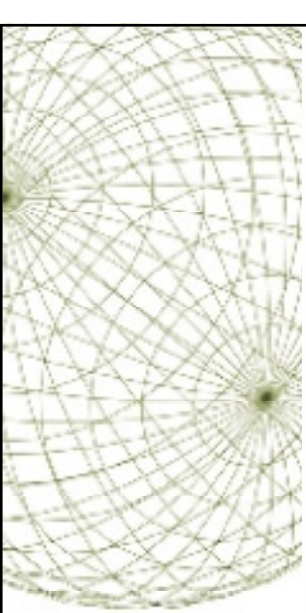


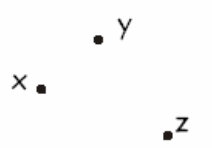

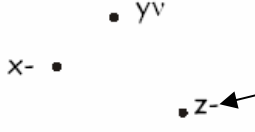

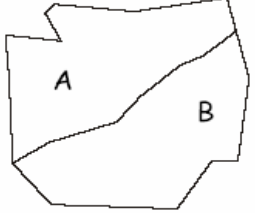

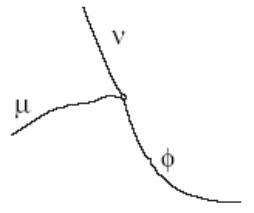
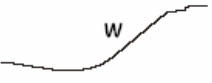


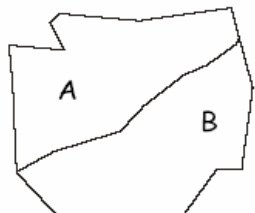

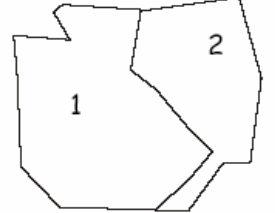
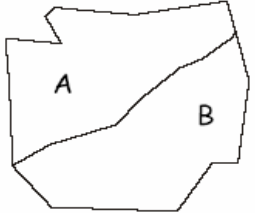
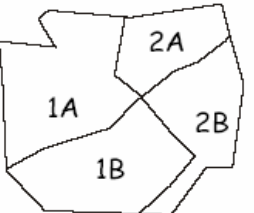
A wireframe globe is positioned in the top-left corner of the slide, partially overlapping a light green circular graphic element.

# *GIS Challenges*

- ◆ Some integration is possible based on geographic location, and most GIS packages have many tools to accomplish this task.
  - ◆ Point-in-polygon overlays
  - ◆ Line-in-polygon overlays
  - ◆ Area union overlays





Input Layer 1	Input Layer 2	Output Layer
point 	line 	point 
point 	polygon 	point 
line 	line 	line 
line 	polygon 	line 
polygon 	polygon 	polygon 

# Geographic Integration Examples

note null or flag values





# *GIS at the Community Level*

- ◆ Residents of the communities are those who have the best understanding of local conditions.
- ◆ GIS implementation at the community level is a very important first step because it allows the community to work as partners with industry and government.





# *GIS at the Community Level*

- ★ The community can review plans from government and industry and determine their impact on the local economy, living conditions, etc.
- ★ Community GIS can also be used to plan for the future and to manage resources (housing, roads, etc).





# *Greater Integration*

- ★ The challenge of greater integration is that it is costly and mistakes are possible.
- ★ A common approach is to let someone else go first and hopefully they develop the techniques that can then be copied elsewhere.
- ★ Even better, maybe they'll share some of the information.



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# *First Nations EpiCentre*

- ◆ The First Nations EpiCentre is working with First Nations Inuit Health Branch, Health Canada, to "go first" and develop a well-integrated GIS environment.
- ◆ Hey, what is this "EpiCentre"?





# *What is the FN EpiCentre*

- ◆ A health-focused professional organization that aims:
  - ◆ To become a centre of excellence in First Nations health program intelligence
  - ◆ To develop First Nations capacity to use information to improve health programs and services





# *What is the FN EpiCentre*

- ★ The EpiCentre is directly accountable and responsive to the needs and issues of First Nations communities through their Board of Directors.



# *Mission of the FN EpiCentre*

- ◆ Respecting the cultural diversity of First Nations, the EpiCentre will improve the quality and use of information required to take action on health, health programs and health determinants.





# *Why is a GIS being built?*

- ◆ The FN EpiCentre must be able to respond to local questions about the possible effect of environmental determinants on human health.
- ◆ A GIS and much data integration are needed before such questions can begin to be answered.





# *Current GIS Contents*

- ◆ Data from provincial and federal sources (roads, rivers, etc).
- ◆ High-resolution satellite data is being used to draw the outlines of every house in every reserve in Alberta.
- ◆ The water data sources are also being captured AND linked to the appropriate building.



# *Examples*

- ◆ The water quality information for the Blood Reserve indicates that some wells become contaminated after certain periods of rain.
- ◆ Using an elevation model, it is possible to build the catchment area around each well to determine flooding potential.

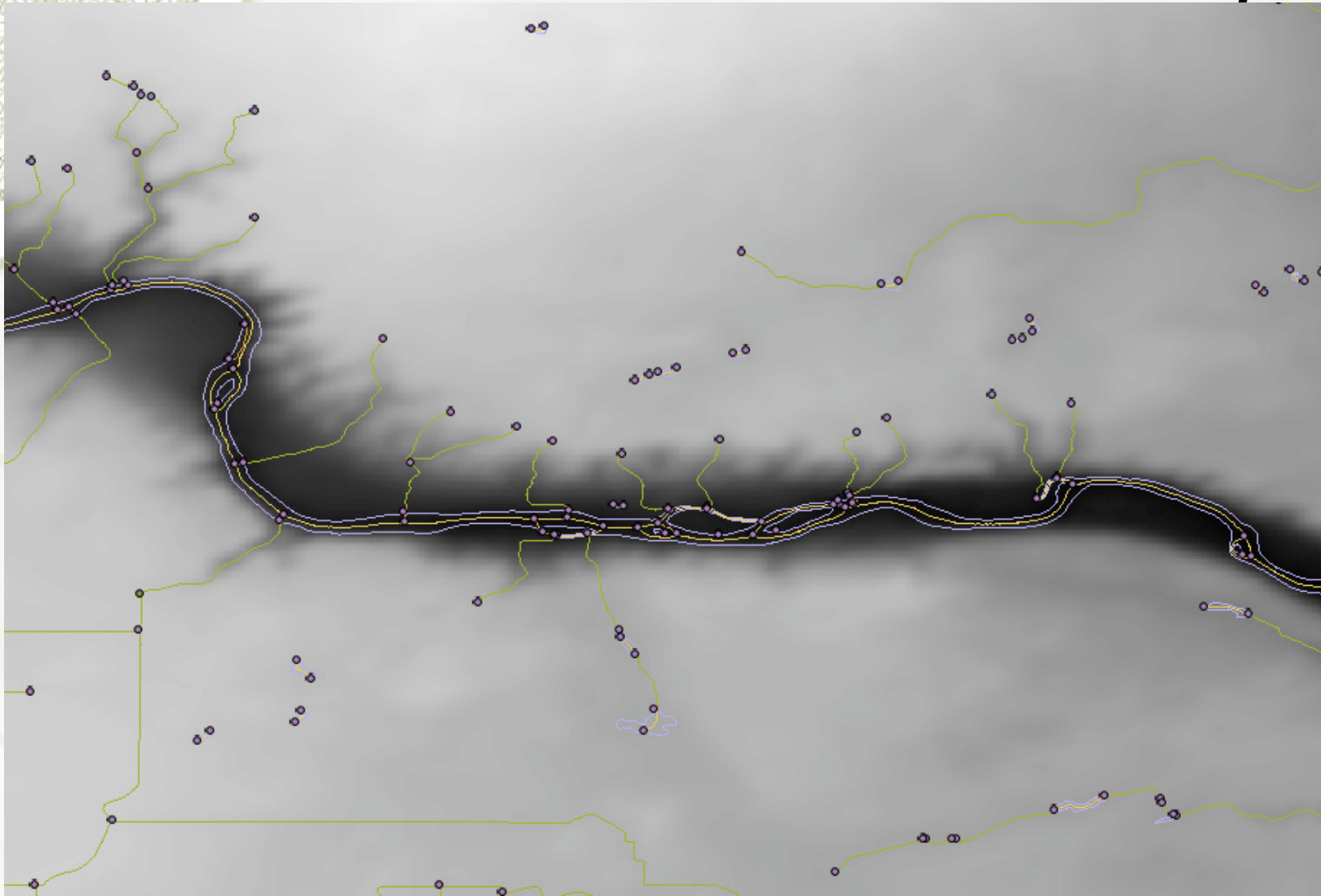


# *Examples*

- ◆ Different flood levels can be modeled to determine their impact on wells.
- ◆ After certain types of rain storms it could be possible to determine potentially-contaminated wells and the houses that use them.
- ◆ Someone could then be sent to advise affected residents to take proper steps



# *Examples*



## *Examples (2)*

- ★ Air quality monitoring information can be stored within a GIS and with proper integration a live monitoring system can be developed.
- ★ Using weather conditions, the extent of an accidental release could be monitored and the residents affected could be notified (Enoch).



# *FN EpiCentre Access*

- ◆ The FN EpiCentre has plans to share all data collected with the communities.
- ◆ It will take some time to load all data and to then determine the best way to access the integrated Spatial Data Warehouse (SDW).



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# *GIS Implementation*

- ◆ The best approach for GIS implementation is to proceed with local implementation plans designed to address local needs.
- ◆ Integration among different types of GIS is now much better and improving all the time.



# *Blood Reserve GIS*

- ★ A very good example of this approach is the implementation of the Blood Band GIS.
- ★ An excellent system is being developed to address current needs.
- ★ Access to other systems and data sources will be possible in the future.

