IMPLEMENTING DELGAMUUK'W

Biography of Dennis Sheppard
University of Lethbridge and President, Geotec Mapping Solutions

Dennis was born and raised in the east coast province of Newfoundland where he earned a Bachelor of Science degree from Memorial University in 1990. Immediately following his university degree, he attended the College of Geographic Sciences in Lawrencetown, Nova Scotia. While there, he completed an intensive 1-year program in information systems and remote sensing. In 1992 he moved to Lethbridge where he taught at Lethbridge Community College. During the same time, he also completed a Master of Science degree from the University of Lethbridge. He is currently serving as an academic assistant with the Department of Geography responsible for the operation of the GIS, Remote Sensing, and Geographic Data Analysis laboratories. In January of 1997, he founded Geotec Mapping Solutions Inc. as a result of a TUS contract with the Kaska Dene.

Thank you, Wayne, and thank you to the Union [Union of B.C. Indian Chiefs] for inviting me to speak to you and hopefully share some information. I'd also like to thank the Coastal Salish for letting me be here. I'm going to try a bit of a guinea pig thing this morning and do the computer projections, and we'll see how that goes.

I may need the lights dimmed a little, please, if anybody is near a switch.

My name is Dennis Sheppard and I'd like to talk to you a little about the role of G.I.S. [Geographic Information System] in managing information. I'd like to first acknowledge the fact that the previous two talks, even though they talked about it being more text-based, is I think very important to link it to the graphic G.I.S. G.I.S., being computer-based, it doesn't deal well with textual and oral story type things, but there have been some attempts at linking the two. I think that should be further explored. Actually, while I'm on this page as well, if anybody has any questions and you don't catch me today, because I do have to sneak out fairly quickly, my e-mail is geotech@telusplanet.net. If you ever have a question or anything just e-mail me.

In computer terms, there are ways of representing the real world. Three of these are a point, a line, and a polygon. A point is composed of an XY coordinate in which a single location is identified, a line is two or more points joined together by a line, a polygon is an area or an enclosed area of equal quantity or quality; again, it can have more than one line. What is a geographic information system, or G.I.S., which is what you will hear down the road, if you head over to the G.I.S. '99? I have taken three different definitions quite closely related, but from three different textbooks. First of all, it is a powerful set of tools for collecting, retrieving, transforming, and displaying spatially-referenced data. The key being there is that it's spatially-referenced. There are many software packages and programs for collecting, retrieving, and transforming data, but the fact that it is spatially-referenced -- in other words, it has a link to real world coordinates: XY coordinates, eastings, northings, latitude, longitude -- that's what distinguishes the G.I.S. It is also defined as a database system in which most data are spatially indexed -- closely related; emphasizes the point -- a decision-support system involving the integration of spatially-referenced data in a problem-solving environment. This has been alluded to several times in terms of integrated resource management. G.I.S. is an excellent tool for integrated resource management, and I think that should be an additional goal if you're entering into traditional use collection because it is not just an archival procedure; it can be used if you get the appropriate scale, you can get involved in operational planning.

Just to break it down a little, then, G.I.S. has four components -- sometimes arguably five, depending on how you break them down. It's going to have some technique of input and verification, some method of storing the data in a database management system, some way of manipulating the data, and some way of outputting and presenting the data. So I would like to take a look at each of those individually, and talk about the data input first.

The first, and the method that I've used quite often, is manual digitizing. In this picture, you're actually seeing a fellow that works with me digitizing a traditional use overlay. It's really just a big board with a grid of wires underneath. You trace it with a really fine crosshair, hit a button, and it sends an electronic signal which records that location in the computer. So you're translating the hard copy map into a digital information. It's geographically referenced by saying, "point XY on the digitizer is really easting-northing, or latitude-longitude in the computer." Once you have got at least four points, it transforms so anything collected from that point on is geographically referenced.

Another technique for collecting data is through scanning. I've noted here that it is not really suited to T.U.S. [Traditional Use Study] type projects. I am being specific to the data that we use, because in many cases a single overlay would store up to sixty-two layers of information -- or different types of information -- all on one overlay. When you're scanning that, you have to have some way of distinguishing between colored lines or patterned lines. For example, if you're scanning a topographic map you could say all the blue lines were rivers and all the red lines were roads. With this, there is no consistency in terms of color of marker that was used, and in many cases the same polygon was identified as having up to four or five different attributes. So it wasn't really suited for this purpose.

Global Positioning System, G.P.S., another fairly high-tech method of collecting data but -- I forget who it was I was talking with, just last night we were just talking about -- an individual could be handed a G.P.S. and, as they're walking around in their traditional areas they could, say, well stop, click a button and start telling a story to a tape recorder of some sort. Bring that back and all the data could be downloaded and it is automatically digital. There is no digitizing whatsoever; it's already there. So that's an interesting technique. Probably a little pricey, though, because a G.P.S. is going to run you $4,000 to $5,000 for one, and you need one that is capable of correcting so you compensate for errors.

Final method here is satellite imagery. This doesn't really apply to traditional use, I don't think, but it is a good way of updating forest-type activities; for example, clear cutting and regen [regeneration] and stuff like that. But just keep in mind that there are many methods.

Data storage and database management is another component of the G.I.S. At random, we have picked some pictures here out of my collection. Data storage is a very important part -- and it is very important to have many copies of your data, or at least two copies: one where you are working and somewhere else. It is called an "off-site backup." That's just a general rule with all things, not just G.I.S. data. If you can do that, it's a good idea. And I have just illustrated some examples here of a re-writeable CD-ROM, a tape backup, and a zip disk. There is a whole slew of other options. And a picture of my computer, resting at the moment.

Manipulation and analysis is a third component. By manipulation and analysis, I mean you can have this data in the software, but what are you going to do with it? First thing you want to do is form topology, and by forming topology -- and what topology is, you're creating spatial relationships amongst the data; you are giving it relationship to each other. Once everything has topology and is geographically referenced -- in the reverse order, of course: geographically referenced and then topology -- you could start to do things like determine area, or counts, or whatever you can imagine, actually. You could start to do things like polygon-on-polygon, point-and-polygon, and vector-and-polygon overlays. So you could determine which areas were identified as berry-picking sites *and* as sacred areas -- a bad combination, I think, but you get the idea. You could start to identify criteria where, "if this, this, and this condition are met, show me all of those areas." So you could do polygon-on-polygon overlays. The key here is that you could determine spatial coincidence, and all that really means is you could find out things are near or by or in each other, related to each other; they coincide spatially.

A very important part of G.I.S. is producing output. For many in the technical field, we could live without the output. But for anybody who wants to hire a G.I.S. technician or just to understand what we are doing, you have got to have output because it just makes the whole world seem so much more likeable. I have put an example here of a big roll plotter; it's an ink jet plotter. Produces maps that are 36 inches wide up to 150 feet long if you like, but highly unlikely. Summaries and reports, you can generate a summary of different counts of different features. And we have done this with myself and Doug [Elias] and Russell [Diabo?], we have created counts of different features for how many bears were identified, how many clams were identified, and so on. That could be used for generating textual reports about the information.

Probably the one you have been a little most interested is suitability of G.I.S. for managing information in the First Nations context. I have been involved now in two traditional use studies: one with the Kaska Dene, and with the Adams Lake and Neskonlith, and I have certainly learned a lot. Being here these last few days have opened my eyes tenfold. So even now this is already out of date; I could probably add to it. But there are definitely some pros to having a G.I.S. or having your information in a G.I.S. Being a computer, it's a very compact store of a vast amounts of information. An example that I remember from school was that the city of Regina used to have an entire room -- and we're just not talking a small room -- dedicated to storing hard copy maps of their city. That could all now be stored in a space about the size of this data projector, just because of the compression of data onto a digital media. So the obvious benefit's there: you don't have to carry around a roomful of data.

The visual capabilities of a G.I.S. allow comprehensive understanding of the data. Even if you're quite close to the project, you sometimes miss over some of the subtleties like, oh, there is a point way over there, should it be there? It was identified. You could check and see who identified it through an anonymous personal identification number. The overlays that I enter do not have a name associated with it, they have a personal identification number and that is linked to a table somewhere else. Another pro is that it's easier to update than static maps. I started out in cartography using the old pen method. You get out your little pen with different size thicknesses, you draw a line, you make a mistake, you ball up your paper and throw it out and start again. Now you make a mistake you erase it, put it in again. If you make a mistake, you delete it and put it in again. If you want make a copy on a different layer, copy it on a different layer. It's the exact line again. You don't have to worry about creating little sliver polygons.

With pros there are always cons. One of the biggest cons is the expense of implementing a G.I.S. Gene [Joseph] alluded to several thousands of dollars. I've discussed cost of G.I.S. software in the range of $30,000 for one copy. It expires, you pay maintenance fees every year in the order of $6,000. So it is not a cheap technology to get into. However, if you can there are all these benefits. Another con is that it is difficult to use and does require training. There is no way around that. You can have some technician or consultant, like myself, customize the software as much as you want, but there are still going to be issues you will need training for. So I would encourage anybody who is interested to check out some training. And if you go to the G.I.S. '99, there will be several schools there which will advertise their programs and it would an excellent idea. Not all systems are suited to all users. Same with anything. Not everybody uses WORDPERFECT, not everybody uses WORD. Some people like the functions of one and not the other. The same applies to G.I.S. It's just a different language.

Getting close to summary. The key to success in my eyes is information, planning, and cooperation. I think it is important to gather information prior to making any decision on investment. For example, have someone internally or externally do a user-needs analysis. That involves the extensive process of interviewing individuals who will be using the information. Don't make any decisions until you've identified all the needs, then go look at the software and have a checklist which says, "this one meets it, this one doesn't, this one meets it, this one doesn't." The one that scores the highest is your best bet. Again, it won't meet all your needs. Plan your course of action. Think about what you want at the end. If you start thinking you already know what you want, you'll stumble. So even if you think you know, stop and think about it a little longer. Talk to some people who have done it and have used it, and there will definitely be things that you've missed. I still miss things. That leads right into the second point: know what you hope to achieve at the end of the day and this will often clarify the course of action. Once you really know what you want then, then your path to getting there is a lot clearer. And finally, cooperate with as many people and groups as you can so you could share resources, share data, share knowledge, and share experience. An example of sharing data.. like, if you don't have to buy a digital database, it is quite expensive. But if you make the plan right at the beginning to share this with someone, you could have it written into the contract so that it's purchased jointly, as opposed to purchasing it under one nation's name, for example. Then the next group, even though they're working with you, are not allowed to use the same data, technically. So it is a good idea to have all of these things worked out prior.

In conclusion then, G.I.S. is a very powerful tool to be used in managing information specific to First Nations issues, but it must be understood that it is not the end-all and be-all. Instead, it must be used in conjunction with the techniques discussed by the previous panelists and attempts must be made to simplify or make the links between the two, or three, or four transparent, so the user doesn't actually realize that you're using all this software. And attempts are being made at doing that, as well. Thank you.