

Coyote Medicine: Tricking Your GIS Student into Learning

By

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Abstract

Native American tradition indicates that each of us carries traits closely associated with selected animals. Such traits, referred to as medicine, are often indicative of occupations that we choose. Among these is Coyote Medicine. The coyote is a trickster and is frequently found within teachers at all levels (K-16), enabling them to get material across to their students where others might fail. In this article I explain the traits of the coyote, and, with examples, show how these might be applied to your GIS student to assist him or her in grasping some of the concepts of GIS. The concepts include identifying patterns, overlay mistakes, creating weird polygons, and recognizing erroneous map output. I demonstrate how combinations of humor, tricks, demonstrations, and repeated mistakes can lead to enhanced learning for your GIS student. These suggestions might trigger your own coyote medicine.

INTRODUCTION

One of the better known traditions among Native Americans is that of ascribing characteristics associated with selected wild animals to humans. The animal most often and most closely associated with teachers is the coyote. On a recent trip to Albuquerque to participate in a GIS Education conference, a Native American participant suggested that I was full of coyote medicine. I suspect that most of us who teach, whether GIS or any other subject matter, possess some level of coyote medicine. Still, each of us who teach can learn from the experiences of others. The following article describes what coyote medicine is, explains its relationship to GIS education, and shares some of my own coyote medicine, acquired through over twenty years of missteps and repeated mistakes.

COYOTE MEDICINE: A DEFINITION

While the actual definition of coyote medicine differs from source to source, the general consensus is that the coyote most generally is thought of as a trickster. This does not fully describe what coyote medicine is, or how its dimensions might be used in the educational mission. One dimension of coyote medicine is subtle subterfuge. In the wild, coyotes will often perform elaborate dances, even rubbing their noses on the ground to distract and/or mesmerize their prey. Then, when the prey is totally engaged by the distraction, the coyote pounces and captures them. We, as teachers, often employ similar techniques to “capture” the attention of our students.

Another technique common among teachers is that of telling stories. Here the coyote is “hoyoka” or storyteller. Some of you might remember the now classic movie “The Strange Case of the Cosmic Rays,” that used the context of a mystery novel to get

students involved in the mysteries of cosmic phenomena. Many of our television commercials employ this technique to sell a product as well. Take, for example, the Taster's Choice coffee commercial in which a soap opera-like environment revolves around a couples shared interest in good coffee. The pending relationship was a compelling message to the audience, getting them to want more and more, thus linking the story line to the product. Or recall the "Cat Herding" commercial that employed both humor (another strong coyote medicine trait) to make its point about how difficult it is to manage company data. Today, there is at least one company whose products are based nearly entirely on the idea of story-driven education. Much of the teaching provided in nearly all religious books is based on the parable (story) that acts as a stage upon which the concepts and ideas are played out.

Those possessing coyote medicine are known to make mistakes – many repeatedly – before learning the hard lessons they teach. Take the example of the cartoon character Wile-e-Coyote who spent his entire inked existence making the same mistakes over and over. Teachers who eventually do learn from their own mistakes are able to point these out to the student. In some cases teachers possessing coyote medicine will even force the student to make these mistakes just to make sure they experience the results of such mistakes.

Coyotes are often thought of as "divine clowns" being willing to do anything to make a point. It is well recognized that the more outrageous the image, the more apt we are able to remember it. Many of the examples coyote give are far beyond the norm – even extreme. Rather than producing examples that are "normal" I typically employ those that are so extreme that the students can't forget. Ask yourself if you can forget the image of a pink and black zebra. The image is so strange, so beyond the norm, that it is impossible for the student not to think about it. So, once again, I trick the student into learning.

Perhaps among the coyote's many traits, the most important and most all encompassing is that they possess the capability to view anything and everything with great reverence or equal irreverence depending on their mood or the need. As Michael Running Wolf put it to me, whenever coyote medicine appears in his life his response is usually "Good Joke Holy Grandfather." Even the most awful of circumstances can present a humorous side. This is what enables the coyote to see the humor in things and share it with others. But, to what end?

DIAGNOSING THE PROBLEM

Today's undergraduate student has typically been exposed, through television and the internet, to large volumes of short burst, high energy, highly polished multi-media sensory experiences far beyond any previous generation. They have even come to expect it in other aspects of their lives, including education (Speaker 2004). In the extreme, it has resulted in an increasingly passive student – one who views himself more as a customer who expects to be both entertained and educated without any input on their part, rather than as a client who must bring something to the educational process. While many faculty members have attempted to recreate some of the experiences of MTV, Sesame Street, and other professional media-based educational input (Deadman, et. al. 2000), most often we lack the necessary budgets to even approach the sophistication of

these programs. Instead we are often forced to rely on subterfuge, slight of hand, tricks and hands-on experience to substitute for these methods (Garner 2005). That's coyote medicine! For most of us this is all we have to get our concepts across to the student.

PRESCRIBING THE MEDICINE

As with any medicine, coyote medicine must be prescribed in the correct amounts (dosage) for treating the correct dysfunction. Because different students learn differently; ie. some are tactual, some are auditory, and some are visual learners (Van Klaveren, Buckland, and Williamson 2002), there is no suggested strategy as to how much coyote medicine to apply nor any set of rules as to exactly when the medicine will be most effective. This is a larger subject than what I am suggesting here. Instead, I provide a few examples (below) from my own classes and recommend that you employ trial and error in your application. Perhaps I'm suggesting that you might consider "practicing" coyote medicine. But above all, I ask you to share your own coyote medicine.

A FEW EXAMPLES

Below, in no particular order, I provide some examples that I have used in my own classes. The figure texts provide a brief explanation for the situation or symptom I am trying to address and the cure... the particular coyote medicine I employ.



Figure 1. **Oral Tradition: The Cat Herding Commercial (What is GIS Design).** Many students have a hard time understanding what GIS design is or why it is important. When they are introduced to the idea of the difficulty of herding thousands of cats (surrogates for data here) they can make the connection. This hilarious and innovative TV commercial is especially eye catching. It is a classic example of the oral tradition in that it uses a parable-like approach to make its point.

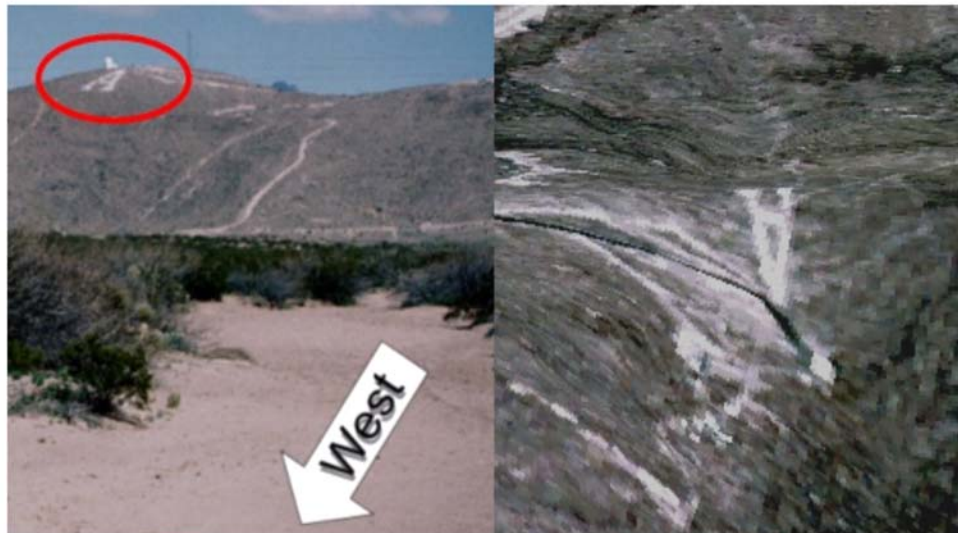


Figure 2. **Heyoka: Results of Doing Things the Wrong Way.** A common problem for my students is that they don't seem to recognize the importance of or the impact of using two different datums. Here I show how the "A" climbs over Tortugas mountain (a local landmark) when two different datums are used to overlay digital aerial photography on a DEM.

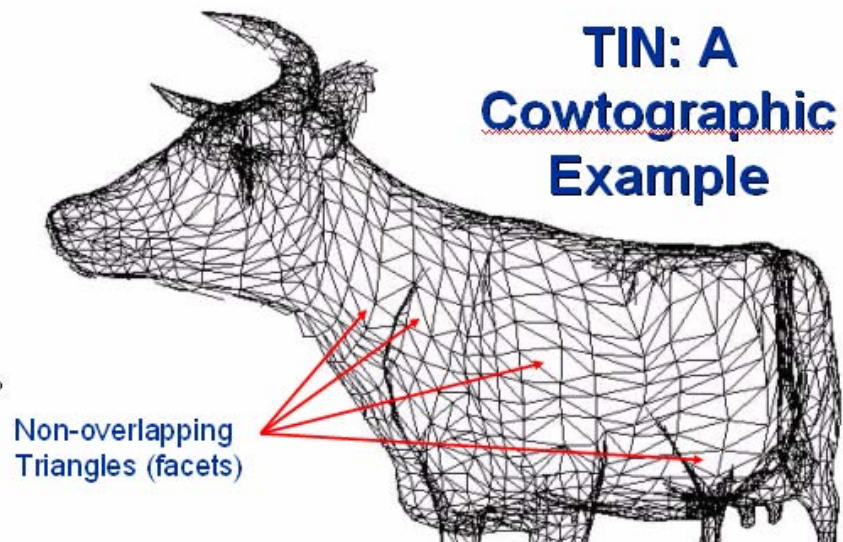


Figure 3. **Humor: Cowtographic TIN (Triangulated Irregular Network).** This example helps the student understand the idea of non-overlapping triangles within the TIN model.

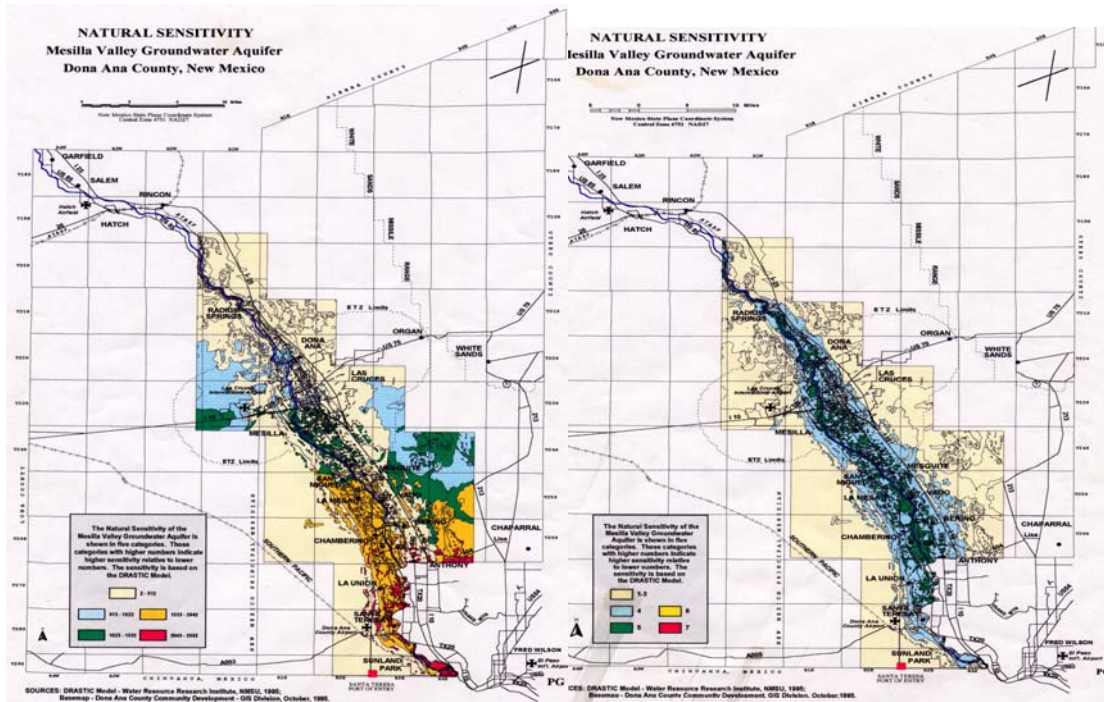


Figure 4. **The subtle mistake.** The map on the left seems reasonable -- even correct, but the categories are incorrect. Instead of showing the DRASTIC numbers as it is supposed to, the user selected the polygon ID numbers. Because the polygons were digitized from top to bottom, their ID numbers increase as one goes down the map. This suggests that the natural sensitivity to water pollution increases from top to bottom. Instead, it increases from upland toward the river (SW to NE and NE to SW).

What Does This Map Show?

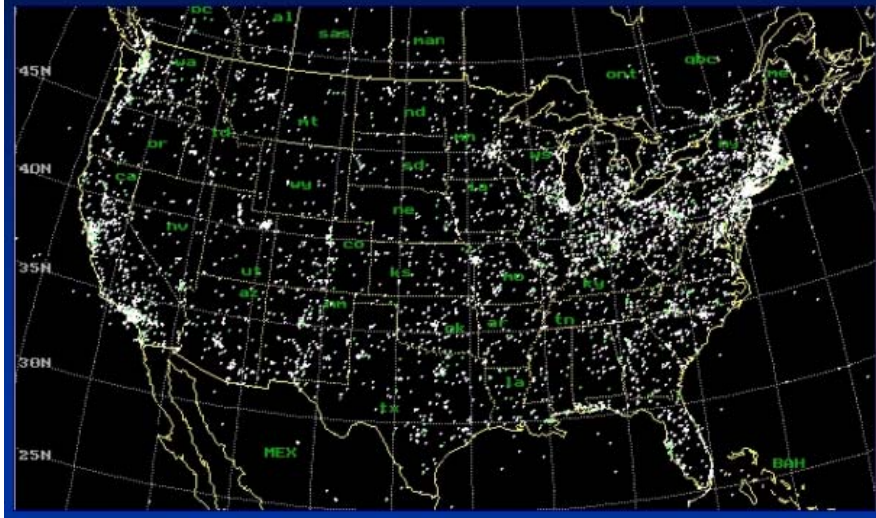


Figure 5. **The Unorthodox Coyote: Pattern Identification and Table Search.** The top figure tricks the student into thinking they are looking at either the Census Bureau's map of city lights, or just a map of population. Instead it is a map of UFO sightings. This unorthodox selection allows the student to think about these three related factors: lights, people, UFO sightings.

Poly ID	Movie	RR Code	Wile Code	Roadrunner Species Name	Wile-e-Coyote Species Name
1	Fast and Furry-ous	1	2	Acceleratti Incredibilus	Carnivorous Vulgaris
2	Beep Beep	1	2	Acceleratti Incredibilus	Carnivorous Vulgaris
3	Going! Going! Gosh!	1	2	Acceleratti Incredibilus	Carnivorous Vulgaris
4	Ziping Along	1	2	Velocitus Tremendus	Road-Runnerous Digestus
5	Stop! Look! And Hasten!	1	2	Hot-Roddicus Supersonicus	Eatibus Anythingus
6	Ready, Set, Zoom	1	2	Speedipus Rex	Famishus-Famishus
7	Guided Muscle	1	2	Velocitus Delectibilus	Eatibus Almost Anythingus
8	Gee Wiz-z-z-z-z-z-z	1	2	Delicious-Delicious	Eatius Birdius
9	There They Go-Go-Go!	1	2	Dig-Outius Tid-Bitius	Famishius Fantasticus
10	Scrambled Aches	1	2	Tastyus Supersonicus	Eternalii Famishiis

Figure 6. **The Unorthodox Coyote: Table Search.** Among the many questions I receive from my students is... "Why do we use codes for conducting table searches." Rather than just suggesting that there are sometimes many proxy names for some objects such as plant and animal species I employ a rather strange, but memorable, set of synonymous species names for Wile-e-Coyote and Roadrunner (the cartoon characters). Again, this example is so much more unusual that the typical that the student is forced to remember it.

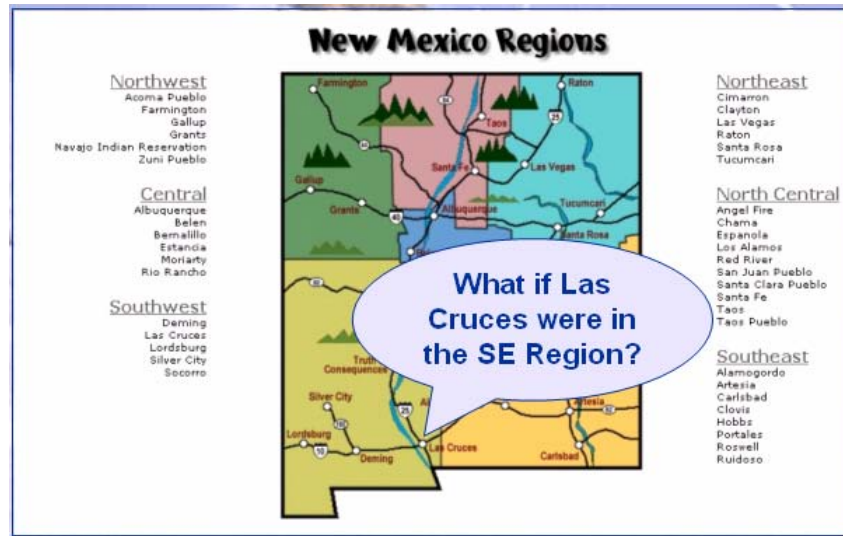


Figure 7. **Disguises:** Exposing the Hidden (Modifiable Areal Unit Example). The Modifiable Areal Unit Problem is another concept that is difficult for students to understand. Here I present an example from the local news in which the state tourism bureau used the southwest region as a sample area to illustrate that tourism was down in Las Cruces. Las Cruces were shocked because all indications were that tourism was up quite a bit. Notice how close Las Cruces is to the southeast region. If the sample areas move ever so slightly the results might have been drastically different.

SUMMARY AND CONCLUSIONS

Whether you call it coyote medicine or just plain teaching techniques, there are many tricks that we as GIS instructors employ. As our audience changes we must adapt to them (Baker and Dwyer, 2005). This is perhaps more true today than it has been in the past due to the many types of media to which our students are exposed. As the pace of these media changes increases, our need to employ new and innovative methods to get material across to our students increases concomitantly. An example is a current shift from group activity to isolated tasks involving computers and gaming that isolate our students from the people they will eventually need to work with in team settings. Thus as the need for educational innovation, tricks, humor, and the like increases, our need for sharing our techniques – our coyote medicine—becomes critical. Please share your ideas with your fellow instructors. In the long run such ideas may be as important to the long term survival of GIS as the scientific and computational developments the research community produces.

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