Where is the Toad?

Questions to Consider Regarding the Creative Geography of Visual Analytics

part 1.

I once heard a supposed zen koan that went as follows: A buddhist monk and his student are sitting together. The monk, peering at his student, tells him to close his eyes. His student complies, and the monk asks him to imagine a large toad that the monk had seen earlier in the day. He describes this toad in great detail to the student, the way it lounged on a log and the way its skin glistened in the damp morning dew. He asked his student: where is the toad? The student, eyes closed, answered that the toad was on the log. Abruptly, he asked his student to open his eyes. When he did, the monk asked him: *where is the toad*?

Visual analytics, the science of analytical reasoning facilitated by interactive visual interfaces, is used to "synthesize information and derive insight from massive, dynamic, ambiguous, and often conflicting data" (Thomas 2005). In the theory of montage, there is a concept known as *creative geography,* in which disparate elements are synthesized in such a way as to represent a single, unified space. In both visual analytics and montage, we create these unified spaces via creative geography to provide insight to a greater conceptual space than that which would be represented by these disparate elements on their own.

Many are familiar with the fictional TARDIS from the BBC show Dr Who: a normal police box on the outside but an expansive spacecraft on the inside. Filmmakers for Doctor Who create this space by splicing together footage of a large soundstage for the inner shots with shots of a normal-sized police box for shots from outside of the TARDIS. Despite this, the TARDIS is not meant to represent two separate places: we are to extend our belief in the visual representation, despite being counterintuitive, that this is one place which happens to be larger inside than out. When we see the Doctor step into the TARDIS, *where is he*?

part 2.

Fig 1: One possible visualization of Idaho's Big Wood River Basin generated in VISTAS using CIRC research data..

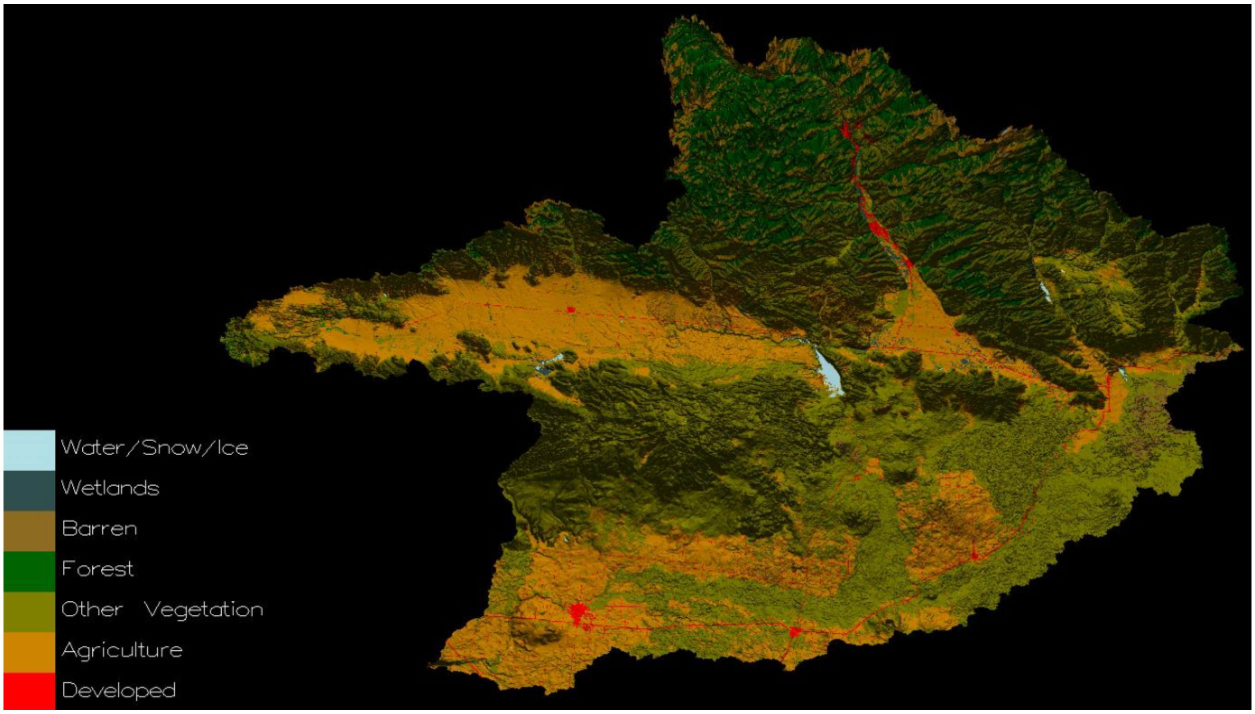
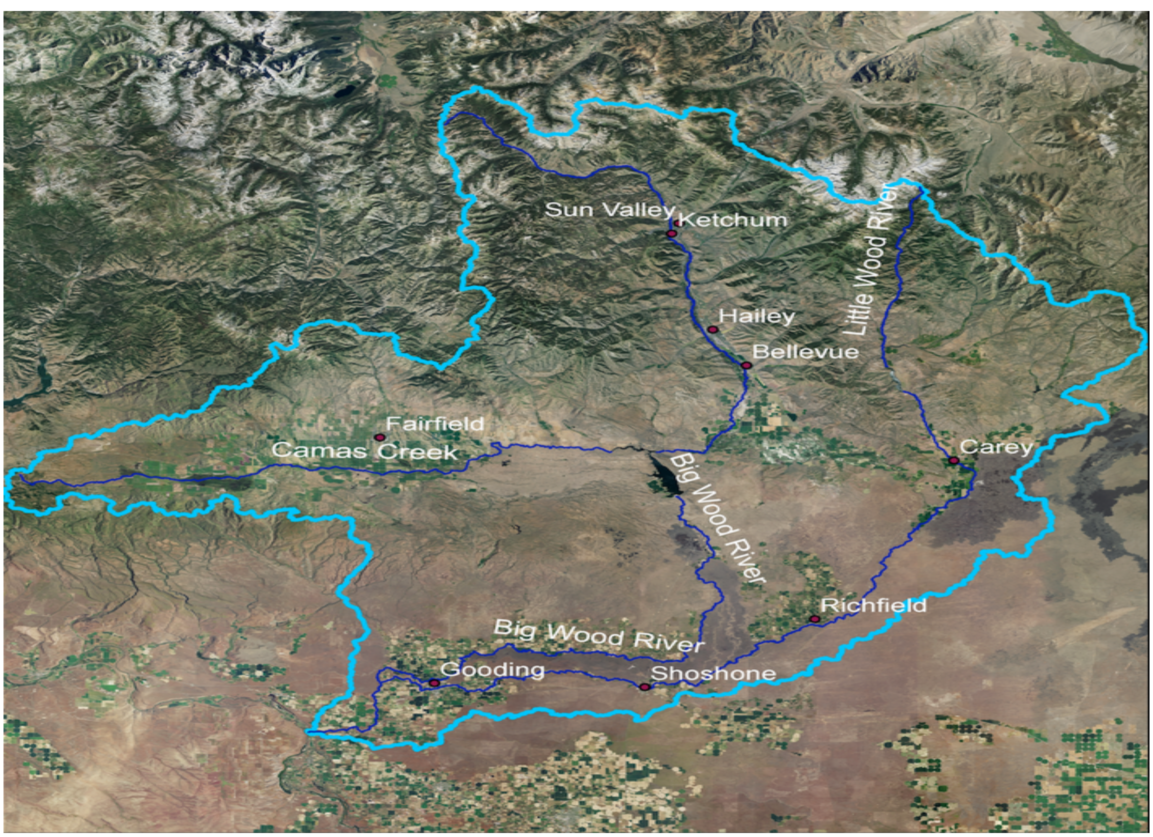


Fig 2: Photographic satellite imagery of the Big Wood River Basin with geographic data overlay; the visualization boundaries of Fig 1 are outlined in light blue, rivers in dark blue.



VISTAS is a visual analytics project to develop visualization software for terrestrial-aquatic spaces. One of the VISTAS research goals is to gain insight into and to communicate the complex ecosystem services of water and carbon in terms of their natural and built components and the underlying topography. These ecosystem services are not easily visible in images of the natural geography of the land. Though Fig 2 represents the physical geography of the land to the viewer, it does not give the viewer any insight into the land other than what is immediately visible to an eyewitness -- there is no information about these ecosystem services being revealed. When we turn to Fig 1, however, we can see new truths revealed: we suspend our belief of what the landscape *should* look like and view it with the colors representative of land cover and use data. These colors -- a disparate element -- are used to represent a greater conceptual space, giving us insight into land makeup and use in the Big Wood River Basin. In order to derive this insight, we must accept the color-represented data replacing the colors of the natural geography.

When a simulation of a landscape reveals truths that the literal photographic transcription of this landscape could not, *where is the Big Wood River Basin*?

part 3.

Fig 3: Six sequential 10-year snapshots generated in ENVISION

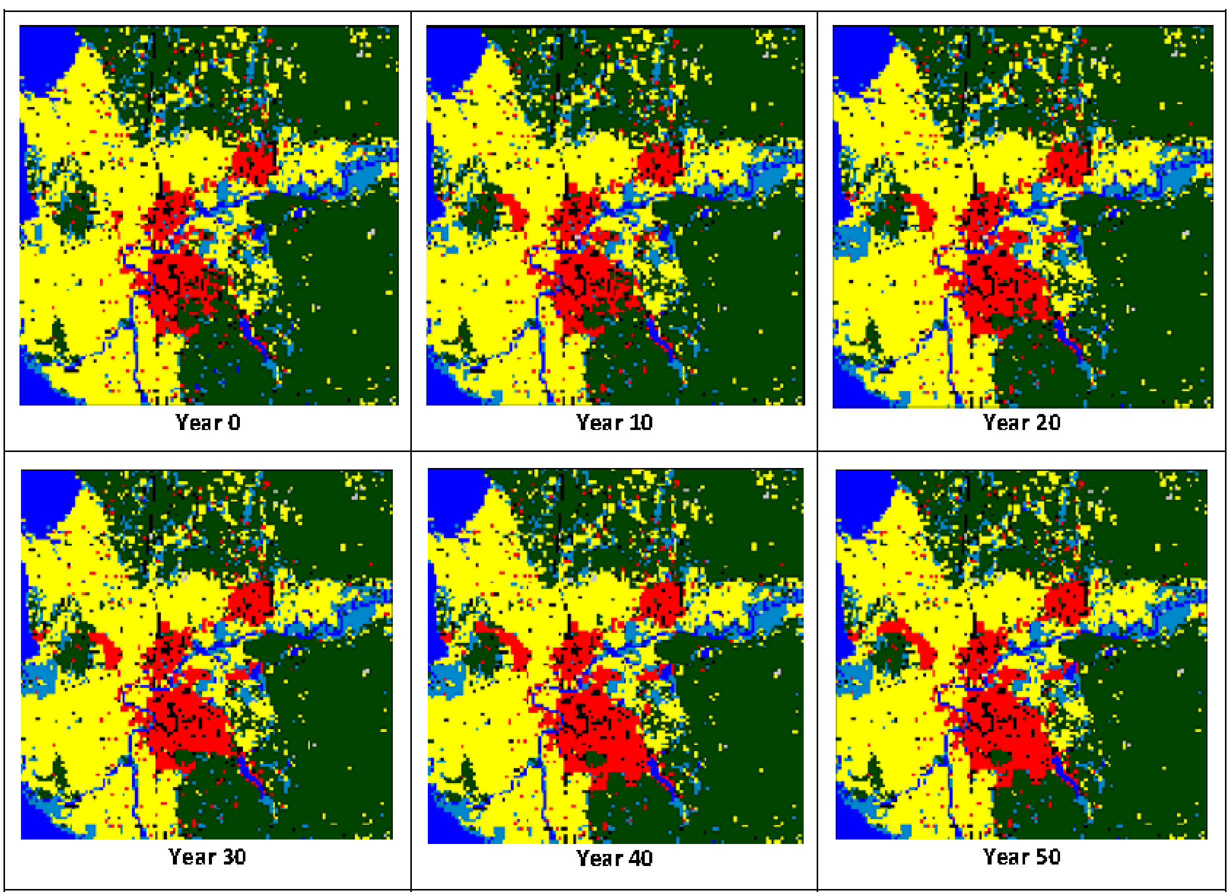


Fig 4: A temporal extrusion of the same 60-year sequence shown in fig. 3; area of dramatic change circled in b.

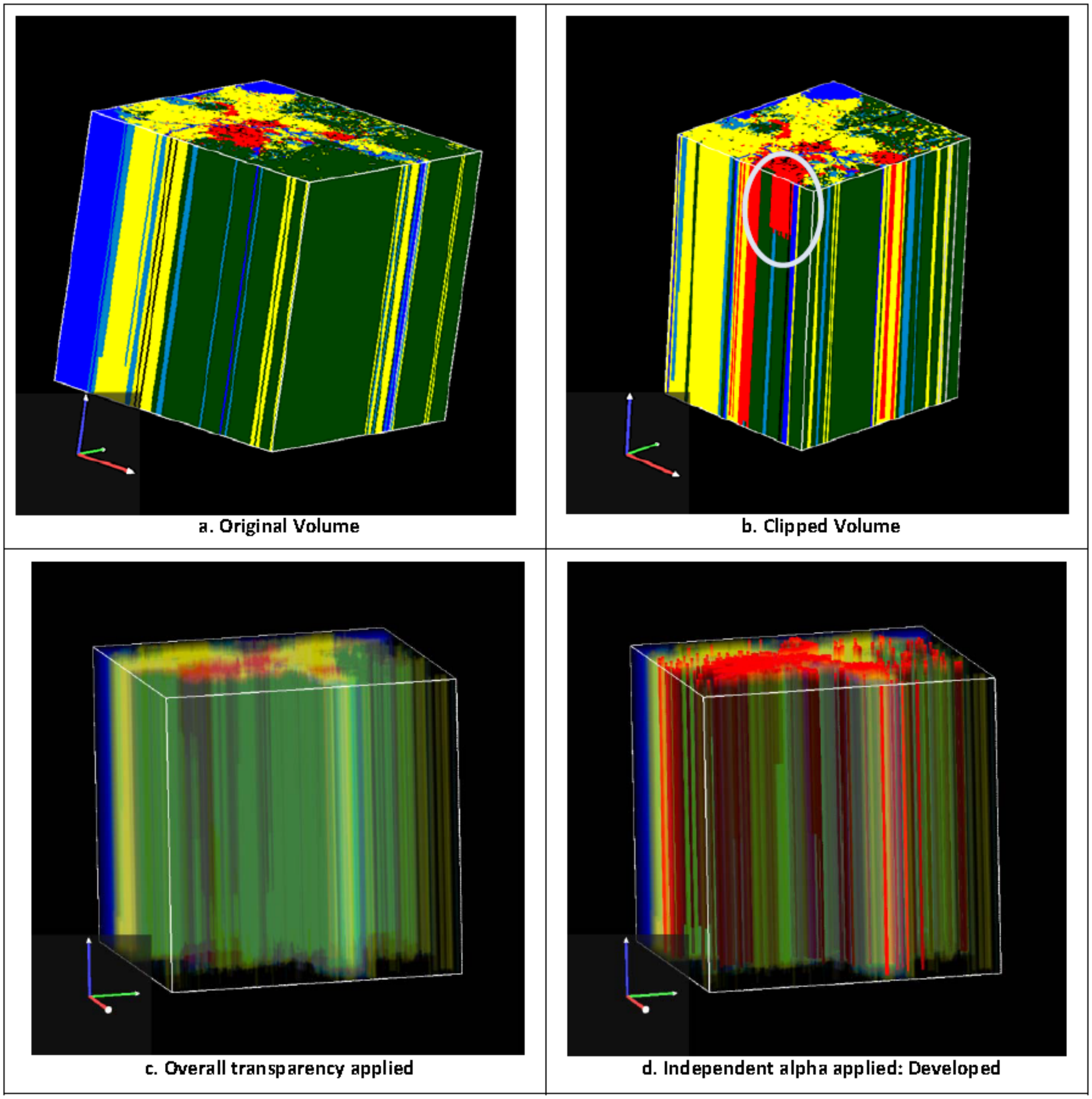
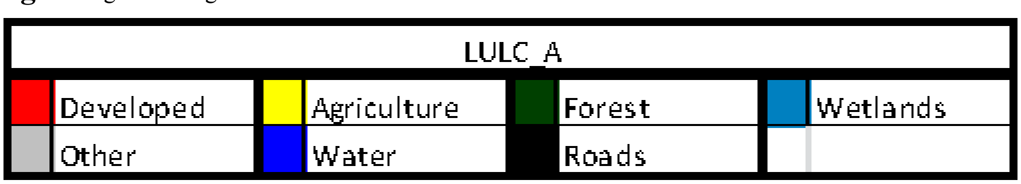


Fig 5: Legend for figures 3-4.



Typically, one thinks of montage as taking places which occur in disparate spaces and combining them into one seamless space, or taking events which occurred at disparate times and combining them into one continuous timeline. If animation can be considered montage of space over time; what could we consider a montage of time over space?

Temporal data extrusion is to visualizations over time as a translucent flipbook of individual cels is to an animation. Through data extrusion, the question of when something happened or some change occurred transmutes into a question of where. Instead of waiting for change to occur, we can see the change appear along the z axis. When we look at extruded temporal data, we ask: *where are the areas of change*?

The ability to transform time into space through montage provides us with an answer to another question: how can we show temporal change in inherently non-temporal mediums? The previous answer to this problem was something like figure 3, a series of images presented sequentially. Figure 4 illustrates the use of extrusion to answer this question for the same dataset, with far more about the landscape and its change illustrated in the same amount of space through the use of montage.

part 4.

Where is the toad?
Where is he?
Where is the Big Wood River Basin?
Where are the areas of change?

FINISH !!!!!!! THIS!!!!!! bibliography!!!!! ASAP!!!!

bibliography:
(vistas papers)

Schultz, Nick, and Mike Bailey. "Using Extruded Volumes to Visualize Time-Series Datasets." Trans. Array *Expanding the Frontiers of Visual Analytics and Visualization*. Springer London, 2012. Print.

image bibliography:
Figure 1: VISTAS generated
Figure 2: http://pnwcirc.org/projects-2/big-wood-river-basin-alternative-futures-project/
Figures 3-5: Schultz & Bailey 2012