Memorandum from SLTT Chair (Matti) to SLTT committee members (3/14/2001)

SLTT colleagues: 03/14/2001

Recent discussion within some of the subgroups indicates the need to restate and clarify the purpose of our SLTT goals and the nature of our classification activities. Please read this memo carefully and at your earliest convenience. If any of you has major reservations, concerns, or disagreements about these objectives, please raise them to all of us now.

By separate mailing, I am sending a copy of this memo to the North American Data Model Steering Committee, whose members also are asked to comment and evaluate the statements.

(1) Databases versus geologic-maps: *Our purpose is to develop classification structures for digital geologic-map databases*, not for digital versions of geologic maps. The production of a geologic-map plot is incidental to the database, and is not the primary focus of the language that the SLTT is developing.

The difference in tone here is important: the hierarchical structure, number of rock classes, and other aspects of our language schema should be tailored to storing and searching science concepts in a digital database, not tailored to the requirements of database fields in a particular data model or tailored to the text in a geologic-map legend.

(2) Language for new data *versus* language for compilation: While the compilation of pre-existing geologic mapping obviously is part of a geologist's activities, the SLTT's primary driver is to develop schema that *facilitate the classification and communication of new field information*. We must look into the future toward novel ways of organizing new data, not into the past to find ways of facilitating the compilation of old data. The former will benefit the latter in obvious ways.

Map compilation (the collation, evaluation, interpretation, and translation of geologic-map information contained in products produced by other workers) is a necessary and legitimate goal. However, the creation of science language that supports geologic-map compilation is not the SLTT purpose.

(3) Do we need to accommodate pre-existing science language?: Compilation of pre-existing geologic-map information requires the geologist to deal with a wide array of lithologic names and descriptors that have come down through the generations. Should the SLTT classification schema create a place for these terms, or define equivalencies for them?

No. *Our task is to create a single uniform, coherent classification that logically, objectively, and thoughtfully establishes rock names and descriptors that classify geologic materials accurately and comprehensively according to modern usage*. We are not obliged to create a list of synonyms or equivalencies. We are not necessarily required to make a place for previous usage, no matter how entrenched that usage might be.

For the compilation of pre-existing map information, it is (and always should be) the responsibility of the map compiler to interpret what a published geologic map contains, and to place this information in the context of modern rock classifications. This

is why geologists (who have the training and expertise to make geologic judgments) should be map compilers. The SLTT classification schema will be *the* modern standard for geologic-map database attributes. *It will be the responsibility of future map compilers to interpret the nomenclature of pre-existing geologic-map information for its position in the SLTT schema, not the responsibility of the SLTT to accommodate all previous language.* Pre-existing language should be treated either in feature-level metadata or dataset metadata: this will create a paper trail for original usage, but will not burden the SLTT schema with the diverse nomenclature of the past.

(4) <u>Language for data producer *versus* end user</u>: *The lithologic classification schema we are developing are NOT for the end user, but for the geologist who is collecting attribute data and populating a database with the attributes.* The production of derivative databases and map plots that serve end users is not the SLTT concern.

Does this mean that the SLTT is not mindful of end-users? Nope. Each of the four subgroups is working hard to develop science language that will form a foundation for users of all kinds—from technical to non-technical. But the SLTT focus needs to be geologist-directed in order for the multiple-user base to be served.

We all are interested in and concerned about how end users access and use geologic-map information. However, I strongly believe that the proper focus of end-user facilitation should be the design of an appropriate user-interface. It will be the job of (a) the SLTT, (b) the data-model design team, and (c) a user-interface team (currently not designated) to design an appropriate tool-set to take the concepts and language designed by the SLTT and make them user-friendly.

(5) <u>Hand-sample language *versus* map-unit language</u>: *The SLTT mandate is to provide classification schema for individual rock types that occur in geologic-map units, together with language that describes the physical appearance, composition, and genesis of these rock types.* The science language must focus on hand-sample and outcrop-scale attributes, but should include rock names and fabric relations that derive from thin-section observations as well as language for sequencing and stratigraphic relations at the map-unit scale.

(6) <u>How comprehensive or finite should our classification schema be</u>? *Our science language should reflect the realities of geology, not the requirements of end users.* However, the geologic universe is complex, so should the classification schema be complex and opaque? Nope. And that is the challenge: to represent rock names and rock structures within families that bring order to the complexity.

In a note to the metamorphic subgroup, Bruce Johnson correctly pointed out that " if the classification is hierarchical, and the first and second levels of the hierarchy are limited to a small number of classes, then it becomes possible to render the map by ignoring lower levels". Bruce's concern here is that the plethora of detail that we could create in our classification schema should not bar the database user from perceiving the major high-level relationships among geologic elements. I agree completely. However, if logically structured, then the number of classes or branches or levels of the hierarchy will not matter.

In my opinion, the user interface will be THE critical device for sorting through the database from higher (general) levels to lower (detailed) levels to accommodate user needs.

(7) <u>Do we need flow charts and glossaries</u>?: To the extent that we must define control terms and root names, etc., then to that extent we are defining a glossary of terms. One strength of the British Geological Survey Rock Classification schemes is the decision-making pathways (flowcharts) that the schemes establish for the use of data producer and data-compiler (and ultimately, from an interface point of view, the data user). A decision-support mechanism is a natural fallout of control terms: the terms must have definitions, and a decision process must be executed in order for a control term to be used or not used by the geologist and end-user. A flow chart is a logical device for displaying the decision-support process.

Let me end by sharing what I am discovering while working with the sedimentary subgroup. In my opinion, we need hierarchical classification schema that allow the geologist to go as deep into the data-attribution process as possible—without getting painted into a corner. The BGS sedimentary classification scheme doesn't have a lot of wiggle room in it. For example, feldspar-rich sedimentary rocks are termed "feldspathic arenites" as defined by Pettijohn. End of statement. End of choices. I personally would be more comfortable if an intermediate level existed that gave the geologist (and the end user) more generic terms like "feldspar-rich" or "lithic-rich", *before* requiring the geologist (and the end user) to commit to the name "feldspathic arenite". This would allow me to classify a rock in the field as a "feldspar-rich sandstone" based on hand-lens observation, and I could stick with this name if I never obtained modal data that would allow me to document the rock as a feldspathic arenite (*sensu* Pettijohn). My audience can get a lot out of the term "feldspar-rich sandstone", even though I haven't tagged the rock as a "feldspathic arenite" *sensu strictu*.

In other words, common sense needs to drive our process—and I ask that you work with each other to find this common sense. A purely academic approach to rock classification and description is not going to do us any good. Even though I minimized the role of the end-user as a target for our deliberations, none-the-less both the field geologist and the land-use manager need a classification that allows each to (a) classify a rock in as much detail as desirable and (b) search the forest before searching out individual trees.

In other words, we do not have an easy job.

Adios,   Jonathan