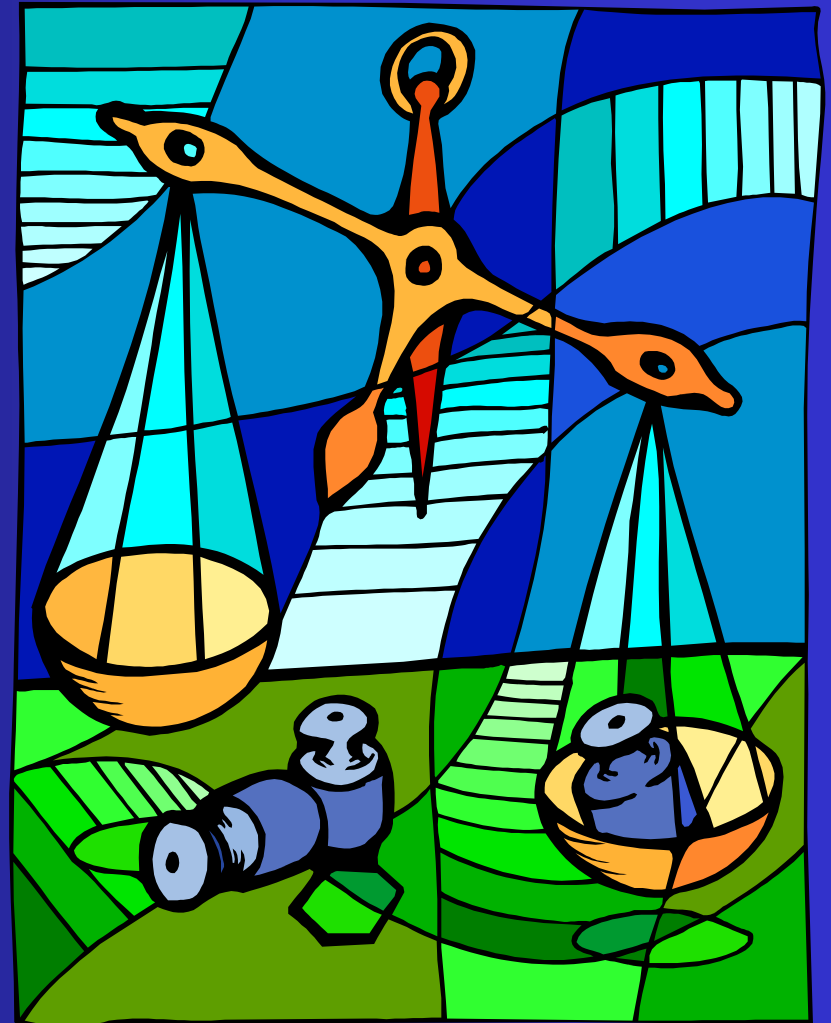


# Are Scientific Honesty and “Best Practices” in Conflict?

David M. Abbott, Jr., CPG  
AIPG Ethics Committee Chairman  
& Consulting Geologist

AAPG Annual Meeting  
Houston, TX  
April 11, 2006



# Honesty: the fundamental scientific ethical principle

## Quotes from the AAPG Ethics Code:

- ◆ Section 1(b): Honesty, integrity, ..., candor, ...are incumbent upon every member as professional obligations.
- ◆ Section 2(a): Members shall not make false, misleading, or unwarranted statements, representations or claims in regard to professional matters, nor shall they engage in false or deceptive advertising
- ◆ Section 2(b): Members shall not permit the publication or use of their reports or maps for any unsound or illegitimate undertakings.

# Honesty: the fundamental scientific ethical principle

## Quotes from the AIPG Ethics Code:

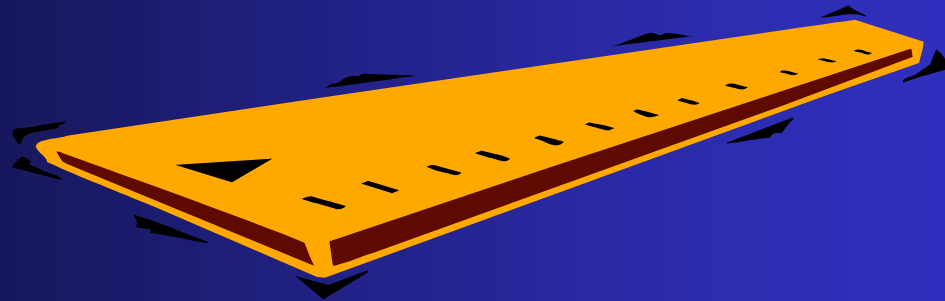
- ◆ “honesty, integrity,...., candor,...”
- ◆ “accurate, truthful, and candid”
- ◆ “shall not make false, misleading, or deceptive representations or claims”
- ◆ “shall not issue a false statement or false information”
- ◆ “shall not make unwarranted statements that may mislead or deceive”

# Bend over backwards to avoid unrecognized bias or deception

- ◆ scientists frequently do not properly acknowledge the limits of what they really know and the uncertainties involved (De Freitas, 2000)
- ◆ “...you should report everything that you think might make it invalid—not only what you think is right about it: other causes that could possibly explain your results; and things you thought of that you’ve eliminated by some other experiment, and how they worked—to make sure the other fellow can tell they have been eliminated.”  
(Feynman, 1974-2000)

# The appeal of “best practices” and “standards”

- ◆ “Best practices” and “standards” provide a yard stick against which practice can be measured.



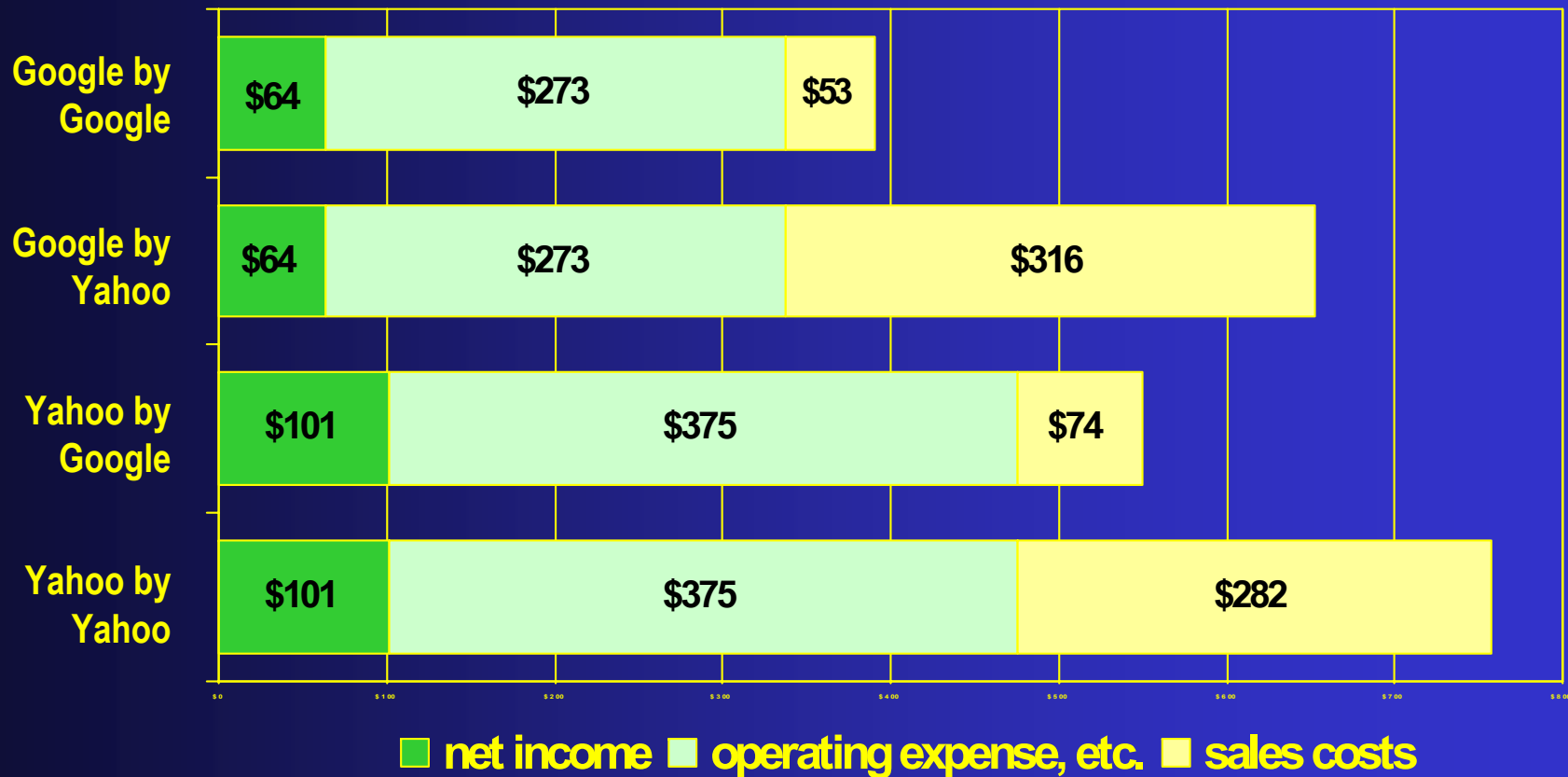
- ◆ Those failing to use “best practices” or “standards” are believed to be incompetent.

# The problem with “best practices” and “standards”

The growing use of “best practice” descriptions and prescriptions frequently conflicts with the honesty by failing to recognize when the “best” practice isn’t the best practice due to changed conditions or changed technology. Yet failure to follow the “best” practice can result in charges of incompetent practice. These difficulties must be recognized with those advocating the use of “best” practices if they are to be scientifically honest.

# “Best Practices” and Standard Procedures—a GAAP example

Google’s 1<sup>st</sup> Quarter 2004 revenue & expenses (millions)



*Wall Street Journal, 10 May 2004, p. C1*

# “Best Practices” and Standard Procedures

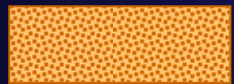
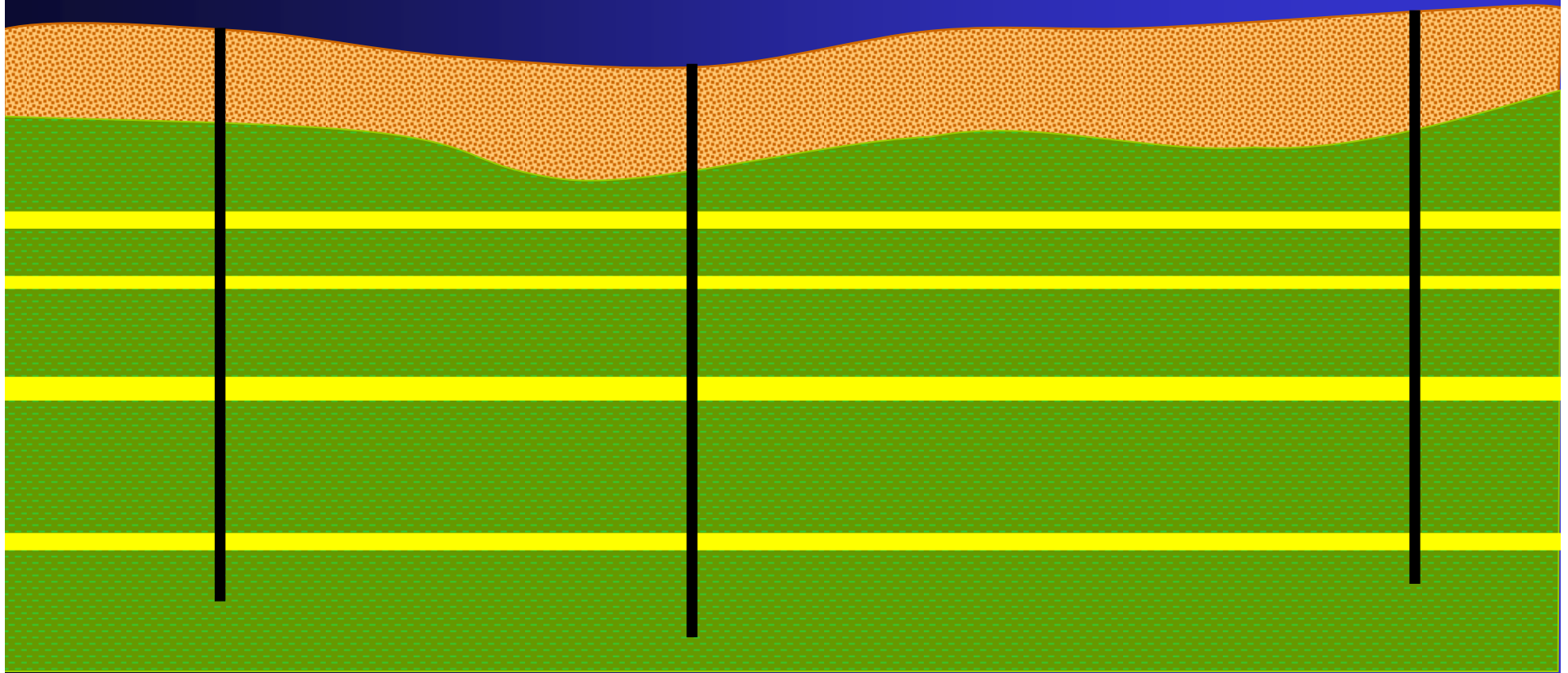
- ◆ May be correct most of the time, but not always.
- ◆ Techniques and practices evolve
- ◆ Legal tar pit

## Examples:

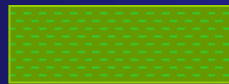
- ◆ Misleading character of fire assays for placer samples; over reports gold content
- ◆ High-grade samples during fraud investigations
- ◆ Improper application to differing conditions



# Standard procedure for swelling soil tests in the Denver metropolitan area



soils

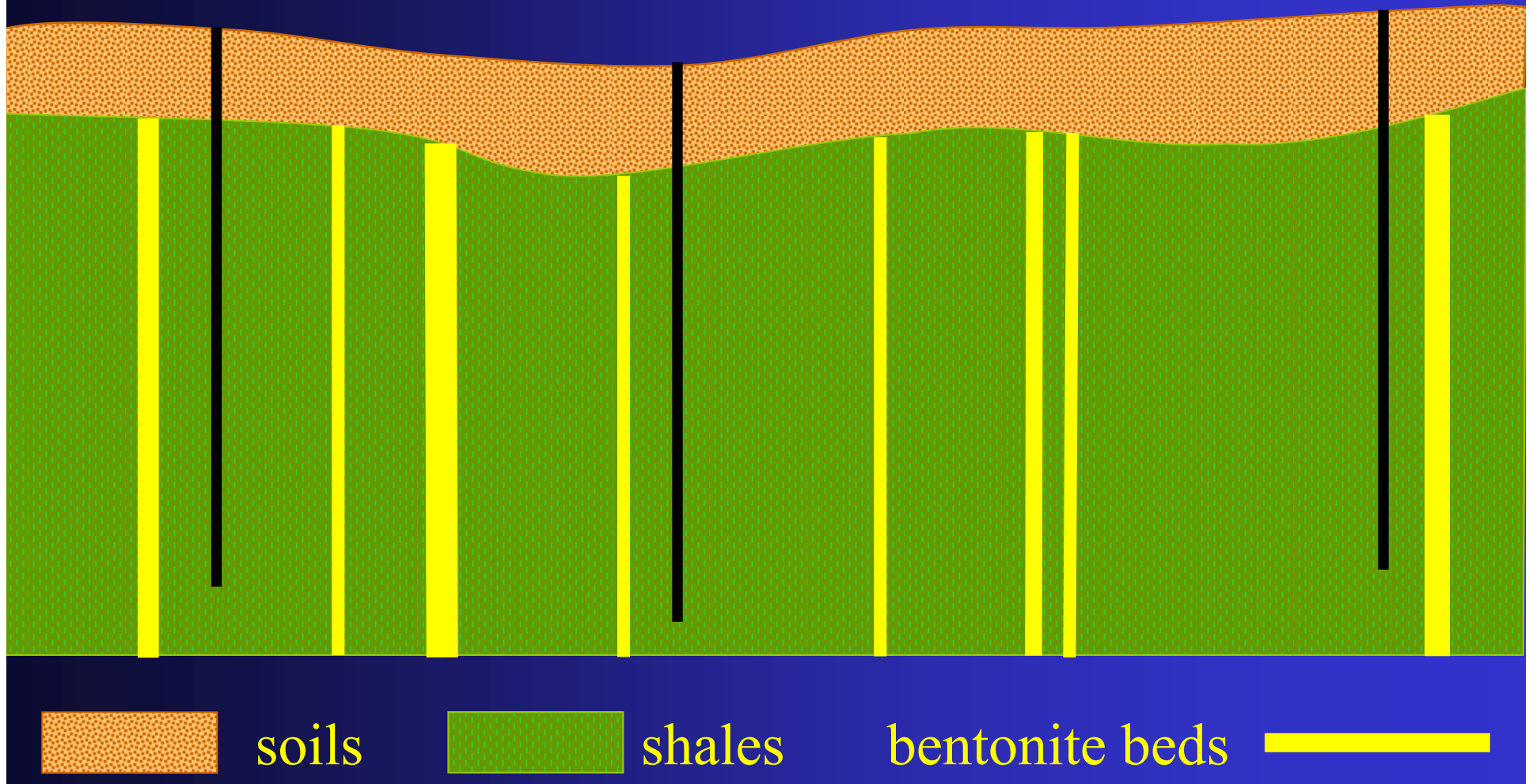


shales

bentonite beds



# Standard procedure for swelling soil tests: doesn't work for changed conditions along mountain front

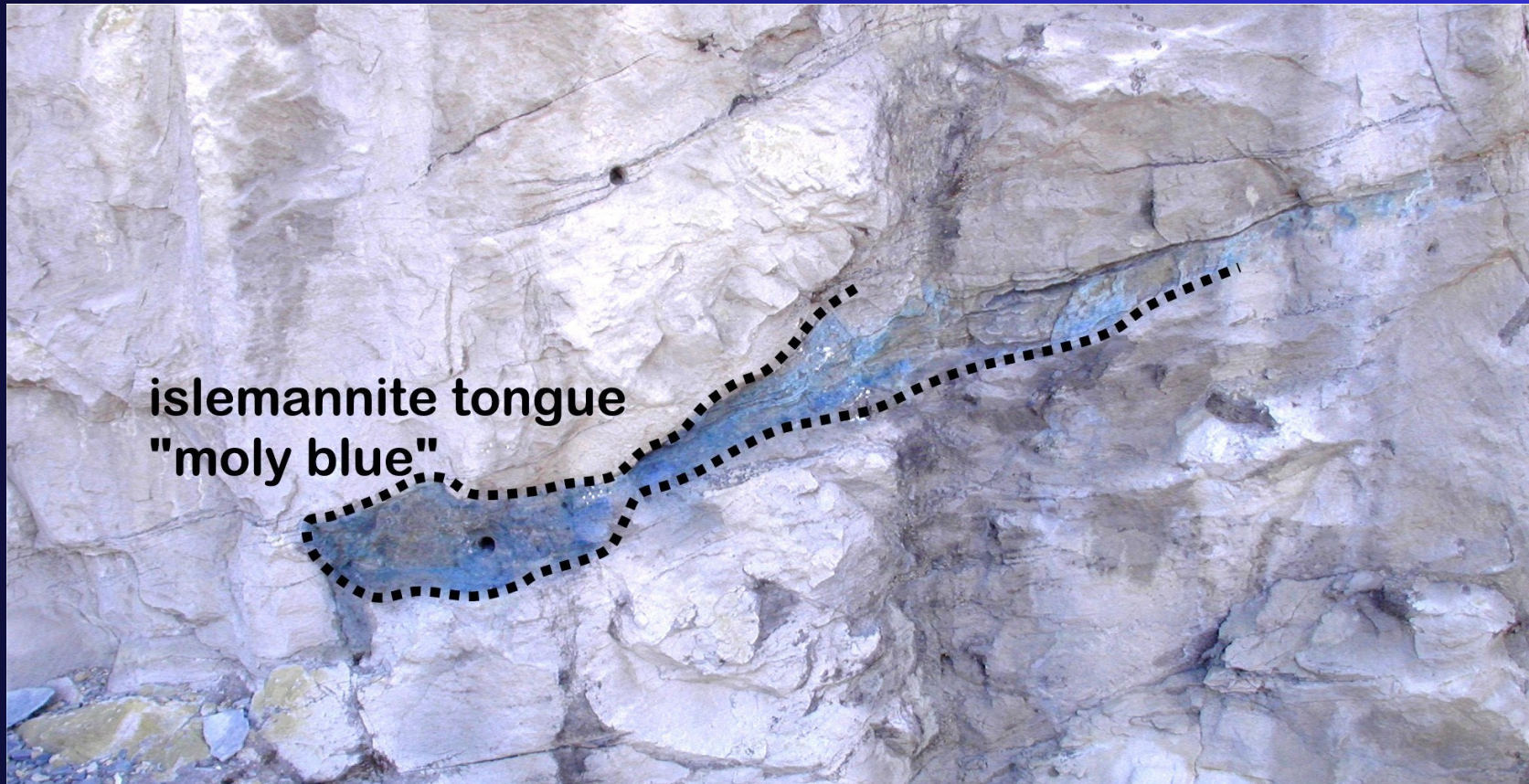


# Honesty: avoiding misuse of models

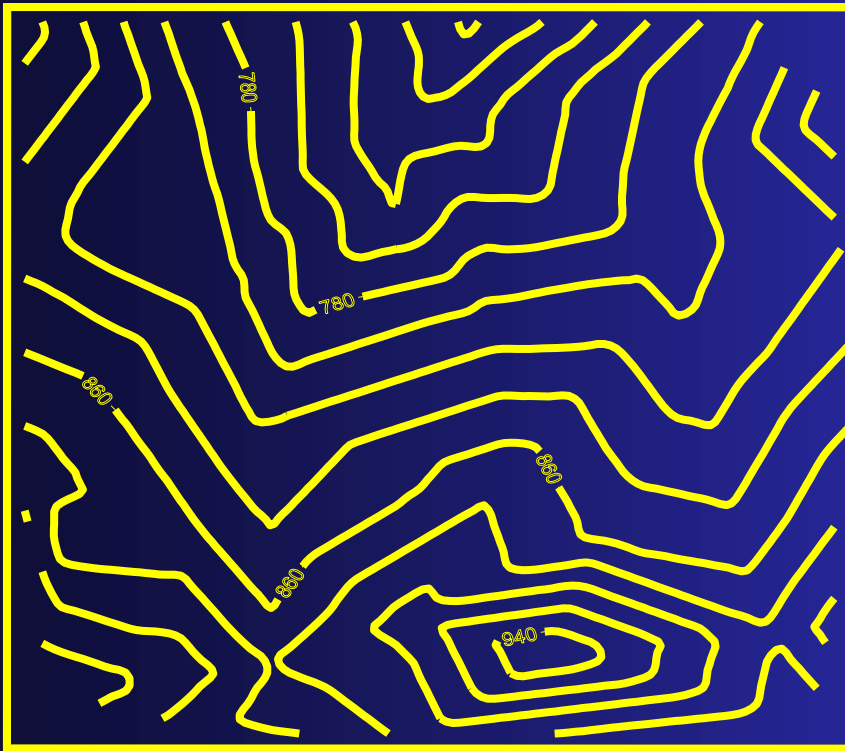
- ◆ Geology is heterogeneous and non-linear—if the mathematics conflict with geology, suspect the math
- ◆ Models can never be validated, they can only be invalidated by comparison with actual data
- ◆ 3D models are interpretations, not necessarily the “truth”

# Mathematical “proof” of exponential decline

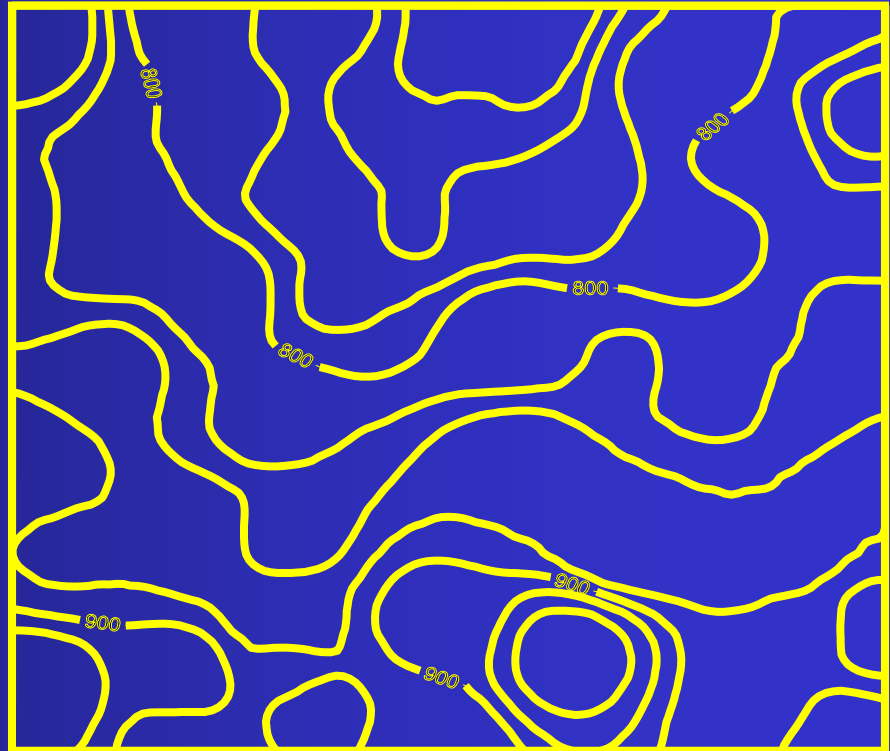
The initial assumptions of the proof—a isotropic, homogeneous layer of infinite  $X$ ,  $Y$  and constant  $Z$  dimensions—are never valid.



# Contouring algorithms



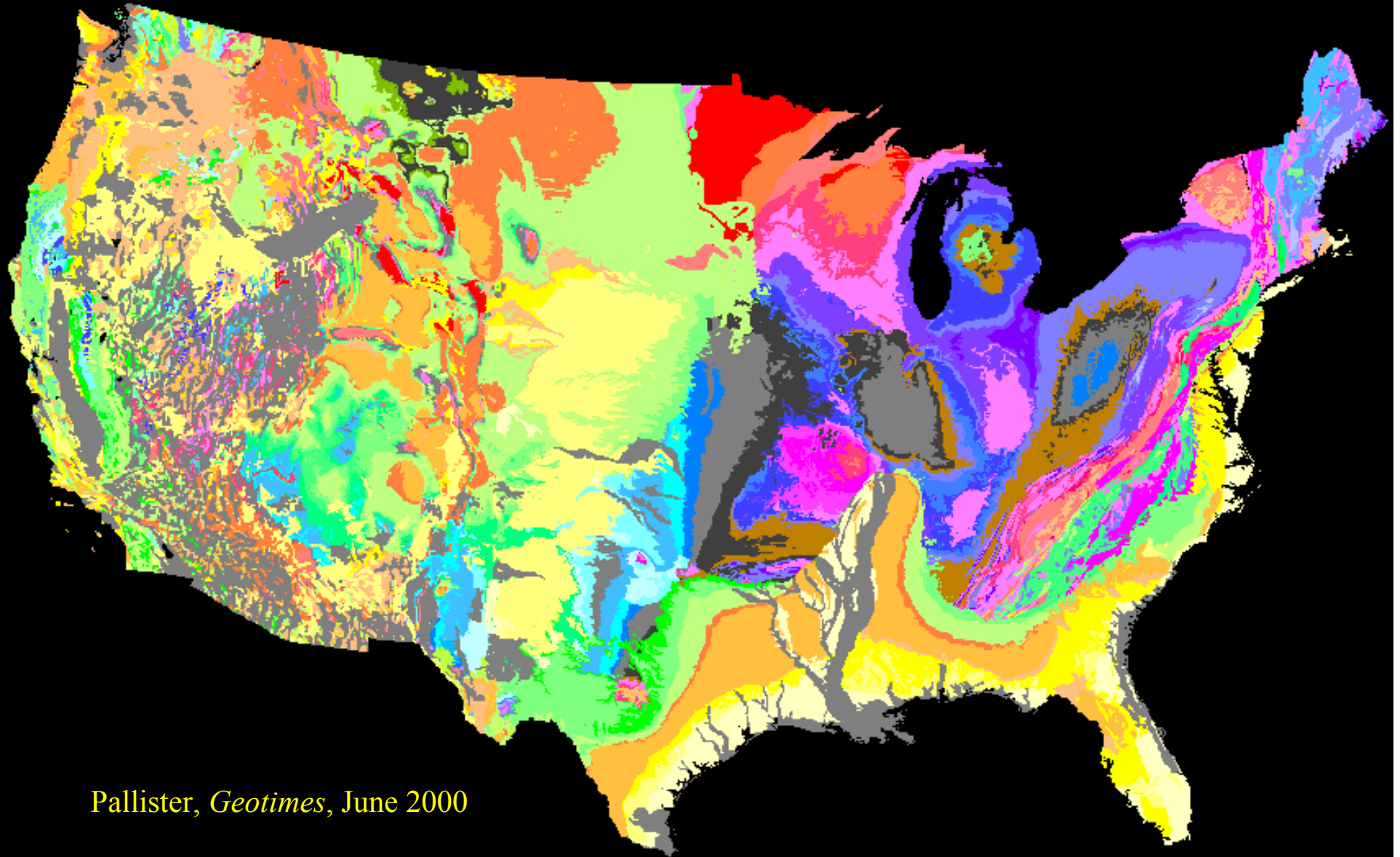
Triangulation  
algorithm



(Inverse Distance)<sup>4</sup>  
algorithm

*The same data points and grid were used for both maps*

# Map scale misuse



Pallister, *Geotimes*, June 2000

# Map scale misuse

- ◆ Include caveats on the allowable and non-allowable uses of our maps, particularly those made available electronically.
- ◆ The importance of appropriate scale should be emphasized.

Pallister, 2000; Peters, 2000;  
*PE&P* columns 57 & 58

# Professional judgment required

Geologic conclusions are, in the final analysis, expressions of judgement predicated upon knowledge and experience. A geologic conclusion, however, purports to be more than an arbitrary determination—it is reached as a consequence of method. No specific method is required, but the method used must be an orthodox method, in accordance with orthodox definition of terms, and the one best adapted to the dealing with the questions asked about the property in question. This is only basis for judging the validity of geologic work. Although different professionals will arrive at different conclusions, they should be able to honestly determine whether another professional arrived at his differing conclusions in a scientifically sound matter.



# Honesty summary

- ◆ Achieving the degree of honesty required of us as geoscientists is difficult to achieve but must be pursued with diligence.
- ◆ It is not enough to avoid conscious lies or deception, we must strive to avoid the subtle deceptions.
- ◆ We must describe what we don't know as much as what we know.
- ◆ We must ensure that the limitations of “best practices” and “standards” are understood by all!

**Thank you  
for your  
attention!**

