


## Whisper, Don't Scream: Characterizing Subtle Grids

Lyn Bartram & Maureen Stone\*  
Simon Fraser University

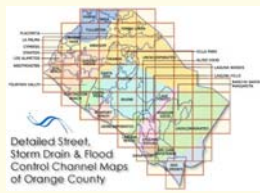
\*StoneSoup Consulting



## Whisper, Don't Scream

A good grid is maximally informative and minimally obstructive

- Support, frame or emphasise data
- Should be **subtle**
- Hard to do well



Detailed Street, Storm Drain & Flood Control Channel Maps of Orange County



## Whisper, Don't Scream : Design

Designers know how to make grids be both subtle and effective



Too obtrusive



Appropriately subtle

Images from "After the Storm," by Bushell & Baker



## Whisper, Don't Scream : Design

Manipulate transparency, layers and **balance**



Too obtrusive



Appropriately subtle

Images from "After the Storm," by Bushell & Baker




## Whisper, Don't Scream : Perception

Perceptual research suggests that feature tuning and variable attention enable subtlety



We can pull into foreground or relegate to background

Images from "After the Storm," by Bushell & Baker



## Whisper, Don't Scream: Problem

- Balance is very sensitive to content, display and viewing conditions
- Balance is hard to maintain in interactive visualization
- How can we put design into practice in dynamic, interactive situations where relying on a human designer is impractical?
- Can we quantify aspects of design principles so we can algorithmically manipulate them?

**VIS 2007** Whisper, Don't Scream: Experiment

We started by looking for the "best" grid

AHAI

1. There may be no single best, but seems to be a range
2. The "fence" effect

- Do people agree on boundary conditions?
- What about interaction with image content?

**VIS 2007** Whisper, Don't Scream: Experiment

Look for the boundaries of useable grids

Too faint: unusable

Too strong: a fence

"Not bad" Grids

Manipulate transparency (alpha)

**VIS 2007** Whisper, Don't Scream: Experiment

flat

medium

sparse

dense

**VIS 2007** Whisper, Don't Scream: Experiment

L\* backgrounds

60	69	78	87	96
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**VIS 2007** Whisper, Don't Scream: Results

- There is a fence and it happens earlier than full "black"
- Correlates with background and complexity
- You can whisper rather than scream in many practical cases:
  - ~ 0.1 alpha for images that are not too dense
  - 0.2 alpha is good for all

Whisper

Mean Alpha: light

Mean Alpha: Range

All cases

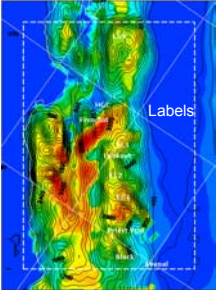
Not too dense

**VIS 2007** Whisper, Don't Scream: Next?

- Different image contexts
  - Maps
  - All sorts of charts
- Colour
- Task-based measurement
- Metrics for analysing image complexity


**VIS 2007** Whisper, Don't Scream: Next?

Contour lines



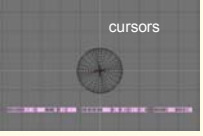
Labels

Grids



Consider more *reference structures*

cursors



**VIS 2007** Thank you

- Questions?