

# A Procedural, Minimal Input, Natural Terrain Plug-in for Blender

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# Problem Statement

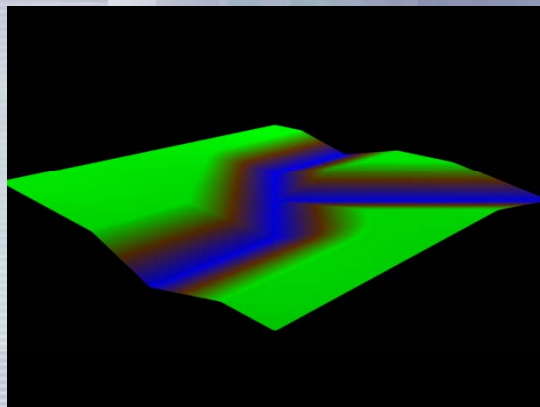
Text-To-Scene system

Virtual worlds

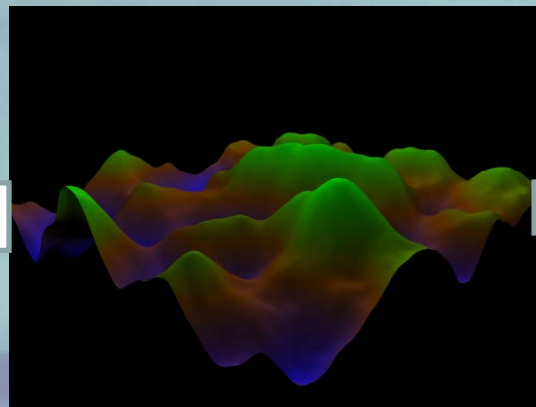
Different terrain and river phases/regions

Realistic looking, natural terrain with  
minimal input

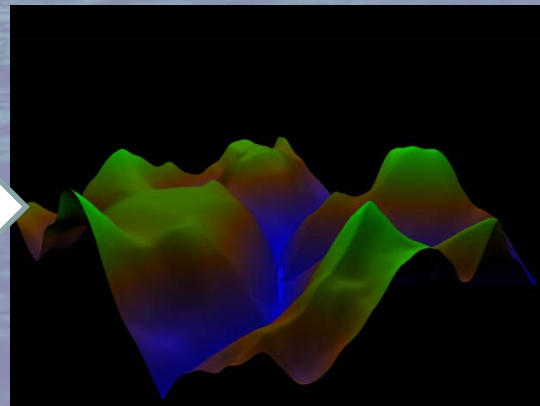
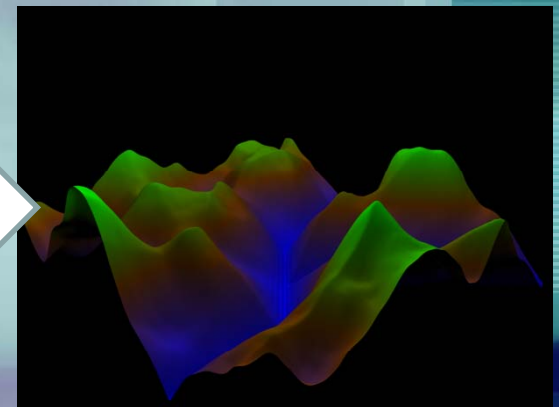
# Method



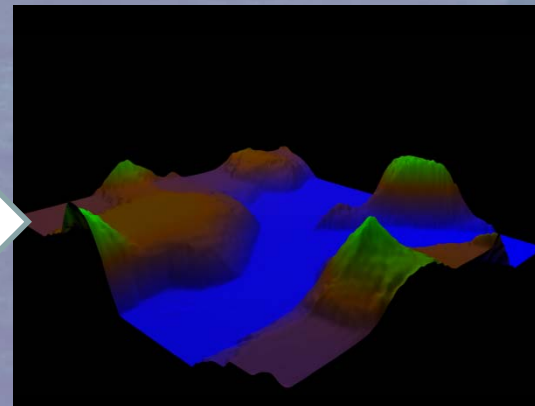
Rivers



Initial synthesis



Flattening



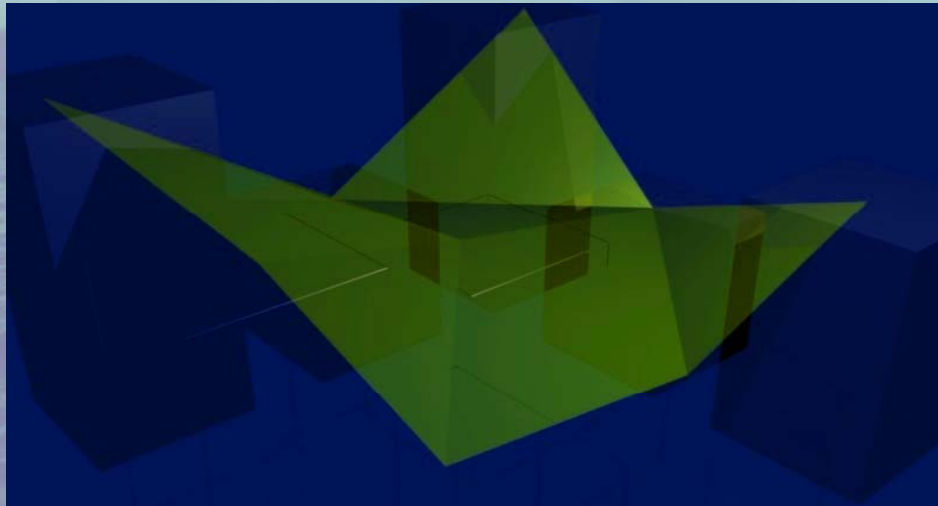
Erosion



# Representation

## Heightmaps

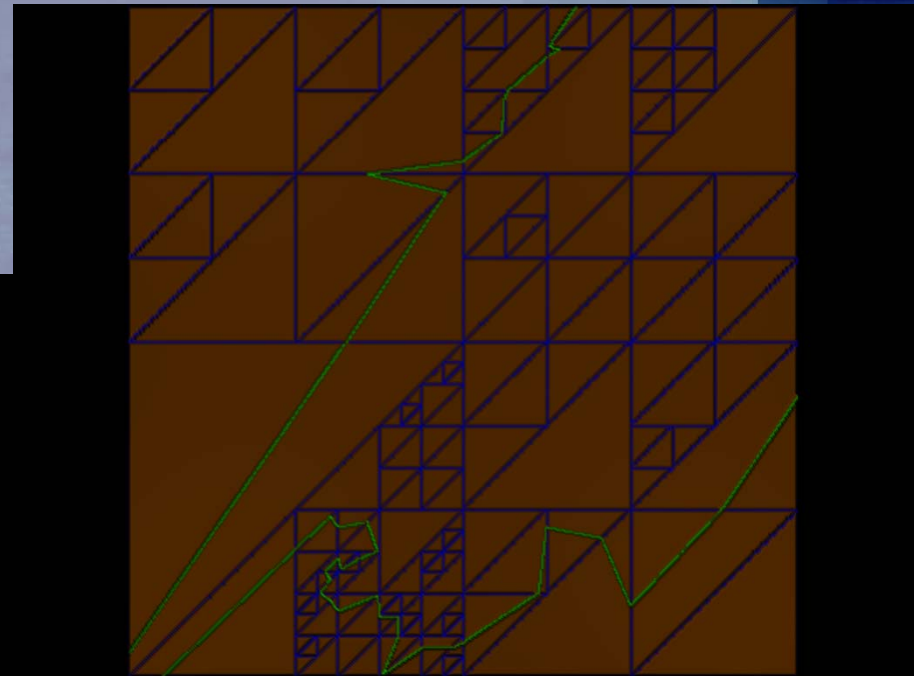
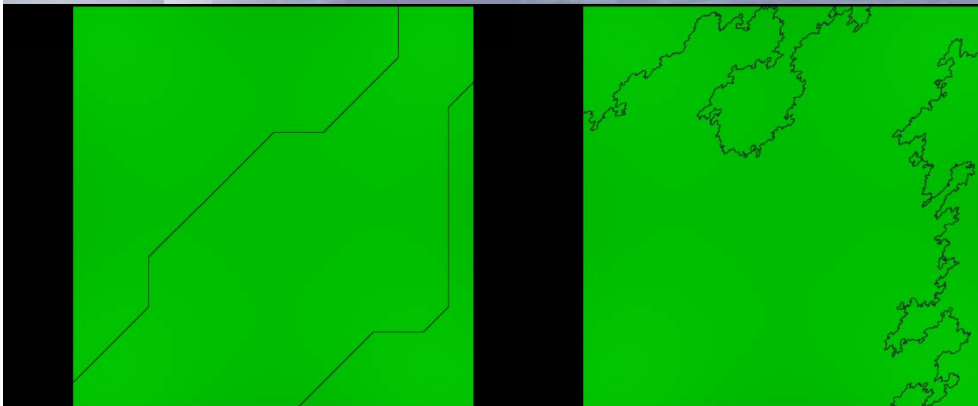
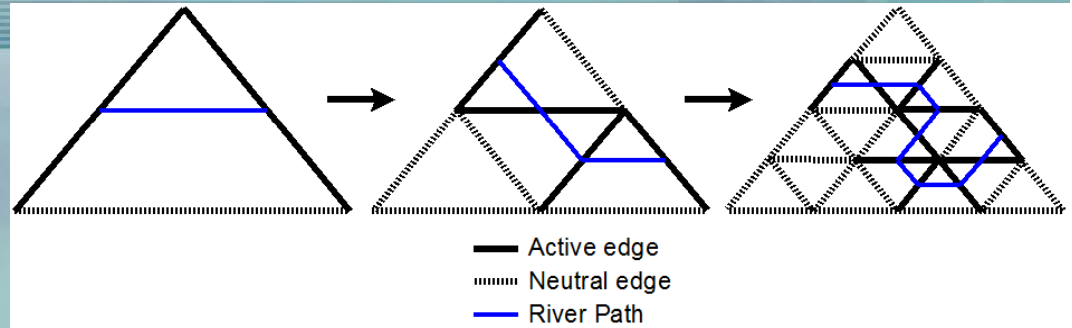
- 2 dimensional grid
- Extended – erosion constants



# River Generation

## Squig curves

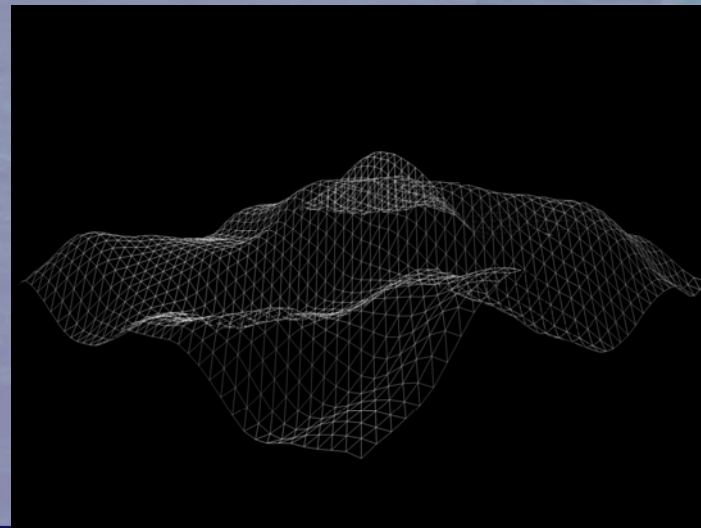
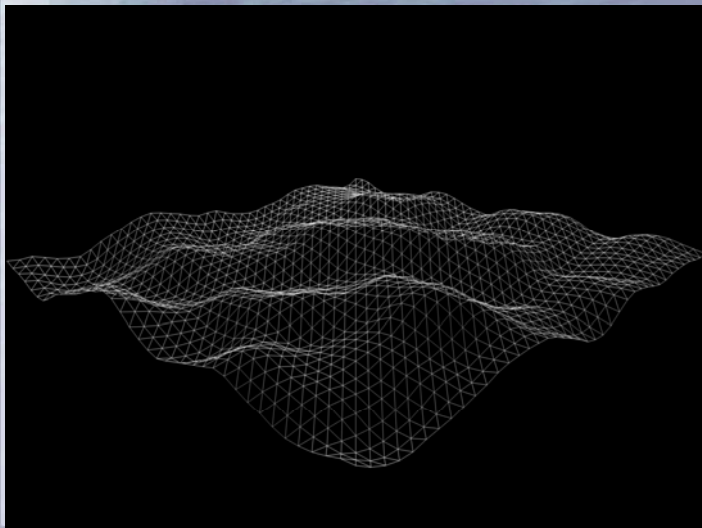
- 2 label system
- Multiple levels of recursion
- Radius of Influence



# Synthesis

## Fractional Brownian Motion

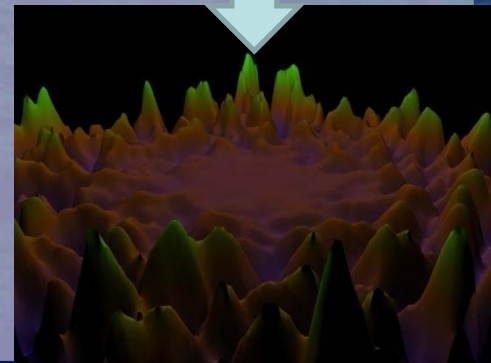
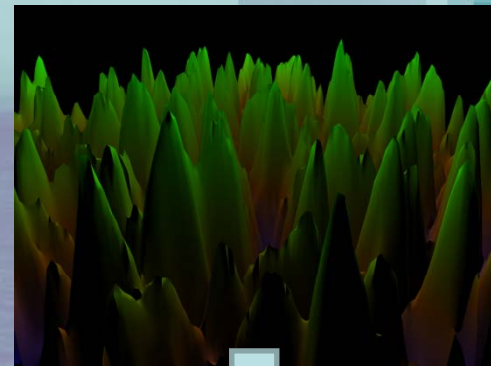
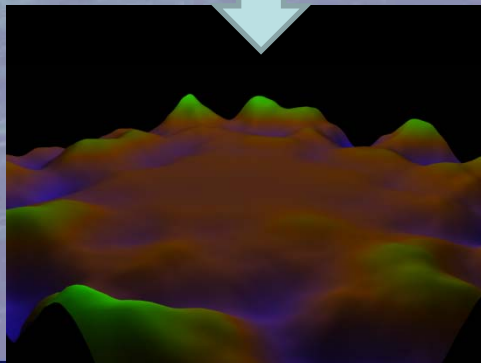
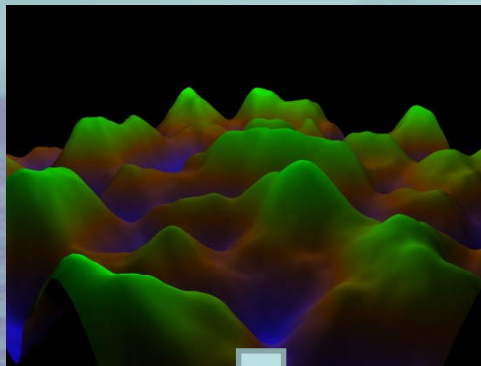
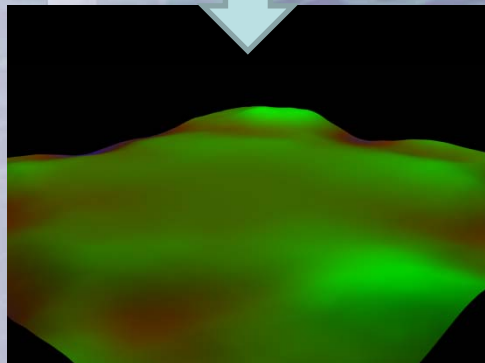
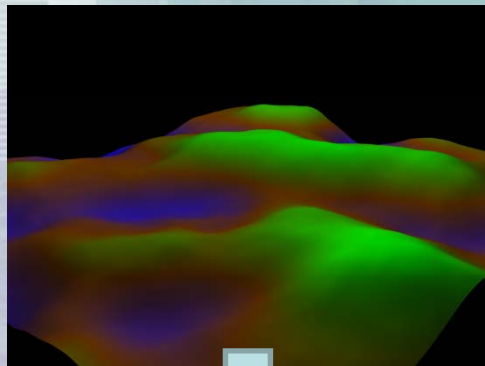
- Sampling noise function at multiple frequencies
- Input and output scaling





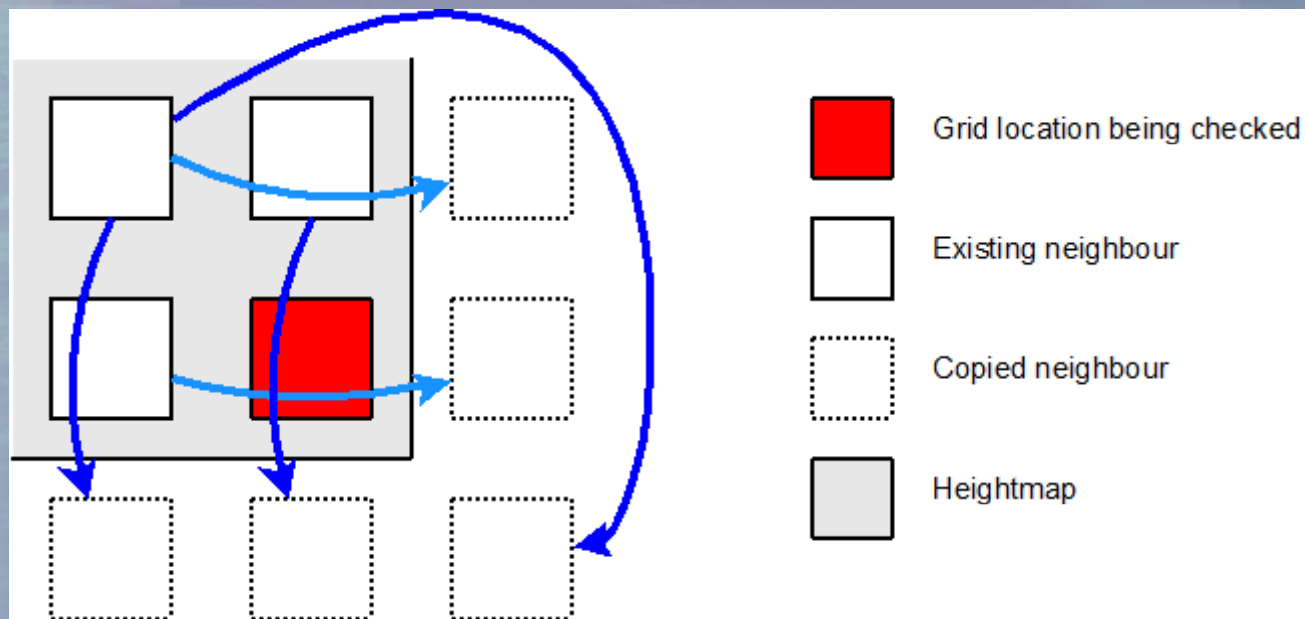
# Flattening

## Flattening



# Realism

- Erosion
  - Pre-calculation step
  - Neighbour faking

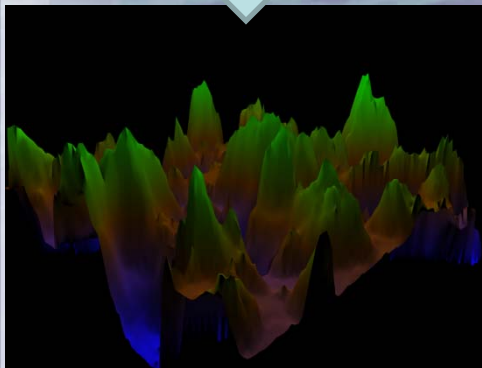




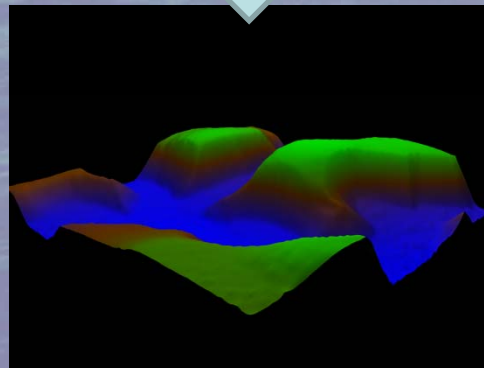
# Recreating Convincing Terrain

- Parameter selection

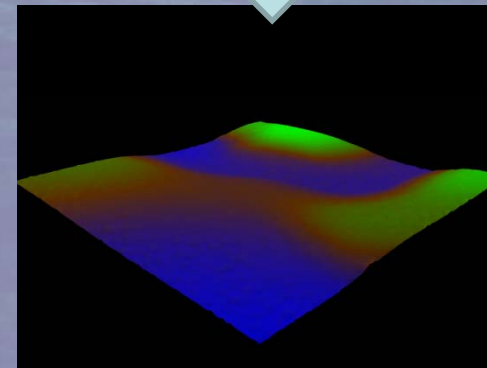
**Mountainous**



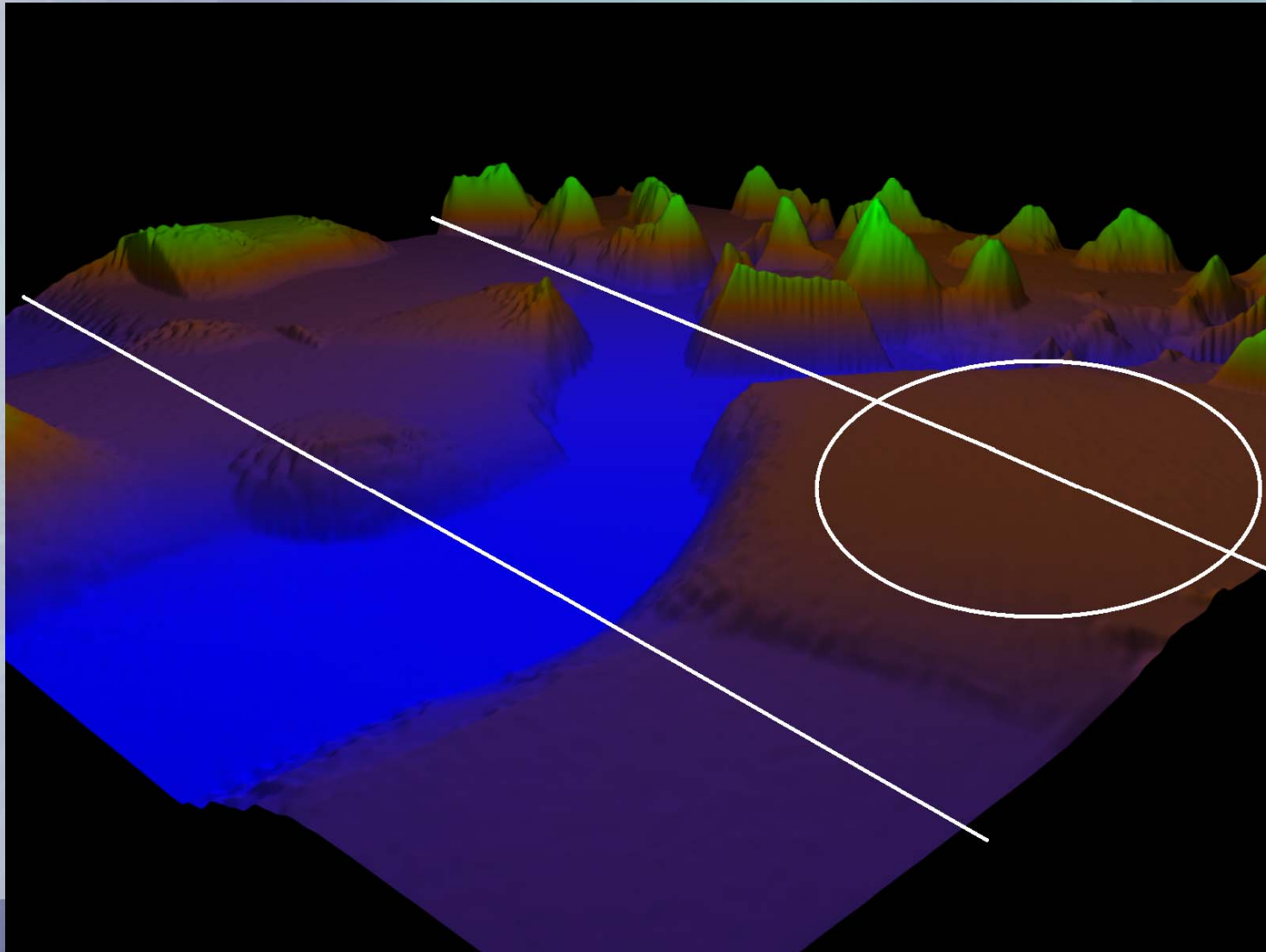
**Rolling Hills**



**Plains**



# Conclusions – Phased Terrain



# Conclusions

- Novel combination of procedural techniques for terrain generation
- Configurable terrain generation with minimal input for TTS system
- Capable of producing realistic looking terrain



A dramatic seascape at sunset or sunrise. The sky is filled with dark, heavy clouds, with a bright light source on the horizon creating a strong glow and a bright light flare in the foreground. The water is dark and textured. The word "Questions?" is written in a blue, serif font in the upper right quadrant.

Questions?