Wild Fire (B)
Milestone Presentation

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Reminder of Goals

- What do you want to visualize?
  - Temperatures under burning process.
  - Bulk density (vegetation density) under burning process.
  - Wind velocity and vorticity field.
  - Factors that contribute to Vorticity-driven Lateral Spreading (VLS) behvior of the fire.

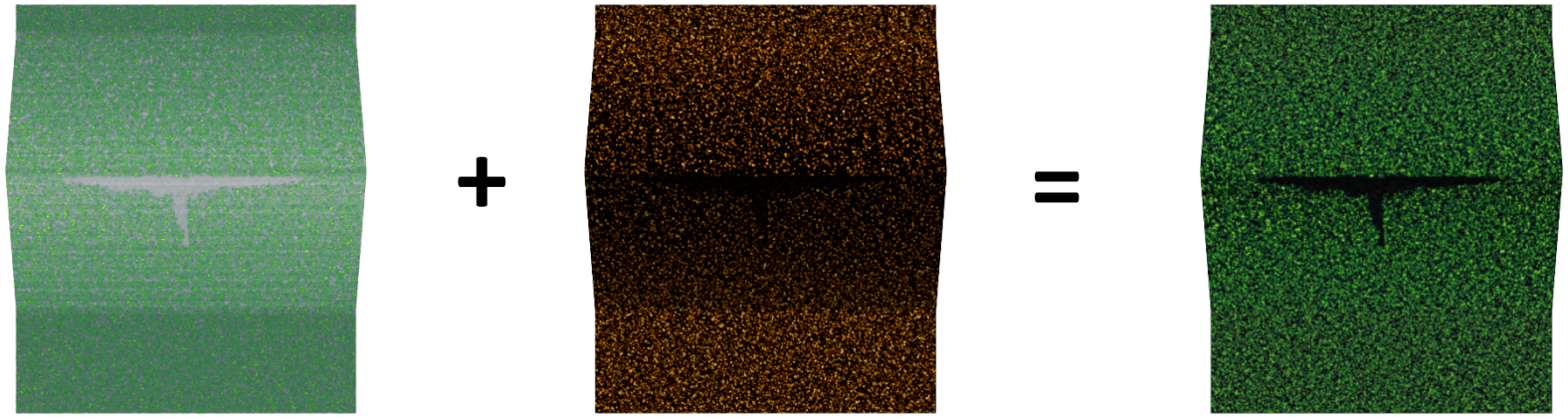
Current State

- How do you want to visualize things? And what you have/haven‘t achieved?
  - Volume rendering: fire, soil , vegetation.
  - Streamline: wind velocity field.
  - Vorticity field: wind velocity field -> gradient -> wind vorticity field.
  - Animations: the evolution of fire on the full “backcurve40” dataset (70GB).
  - Isosurfaces: more precise contours of fire, decided by oxygen level and fire-induced heat.
  - Quantitative Analysis: on how terrain and vorticity influence the VLS behavior.
  - Implementation in VTK.

- Are you on schedule or behind?
  - On schedule.

Results

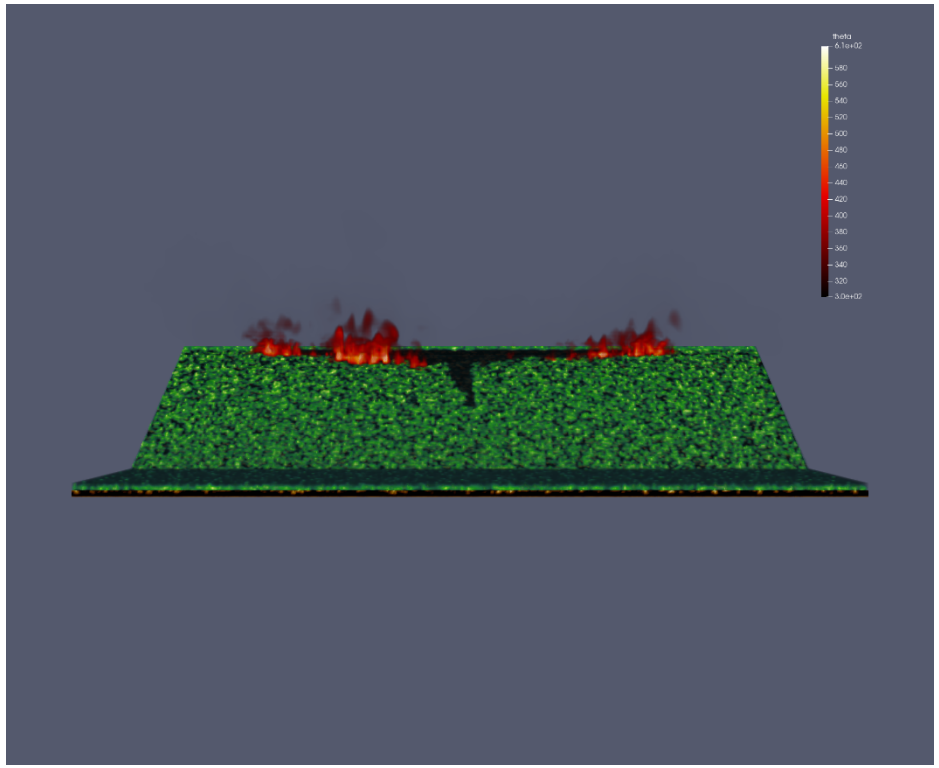
- Vegetation, Soil
  - Takes the bottom few layers of the curvilinear data.
    - **Vegetation**: resample to ImageData and use directly volume rendering.
    - **Soil**: thinner than vegetation layer and rendered as surface for best visual effects.
    - **Composition**: show a more realistic vegetation scene and the trace of fire (disappeared vegetation and scorched land) after burning.



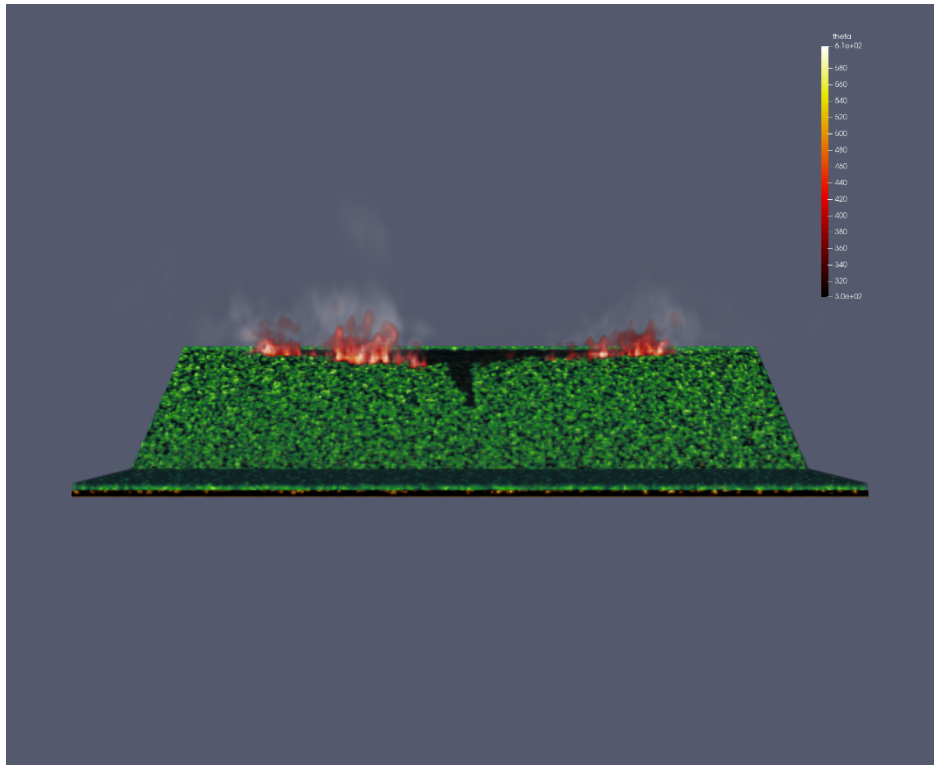
Vegetation Soil Composition

Results

- Fire, Watervapor



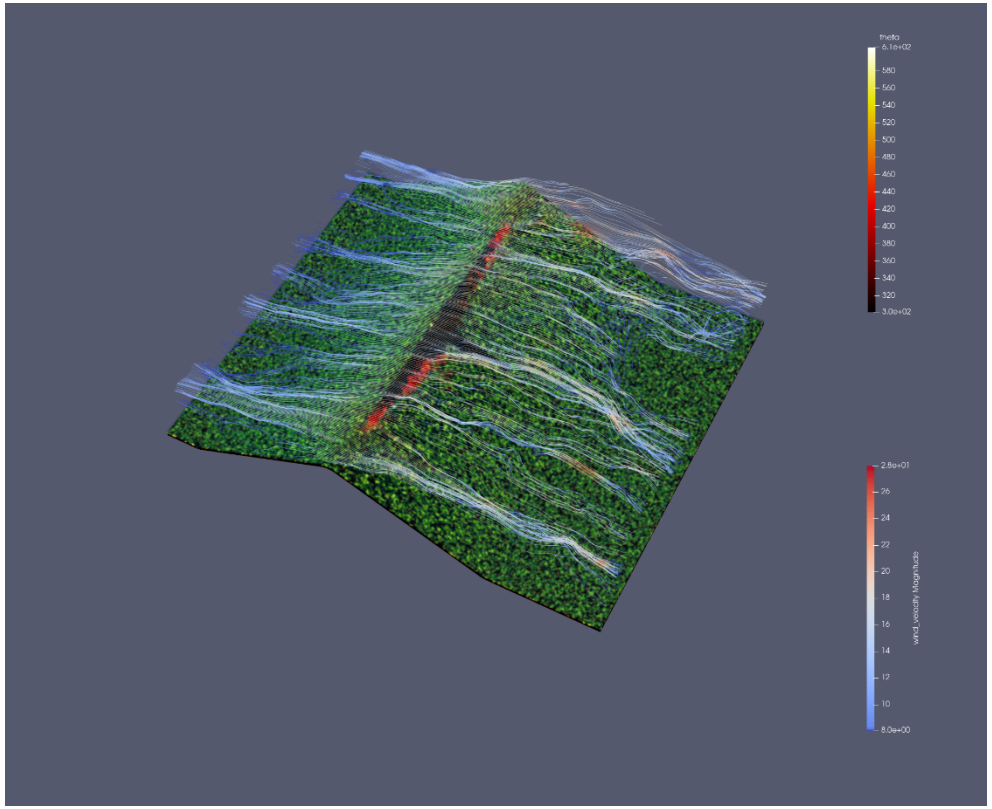
Fire



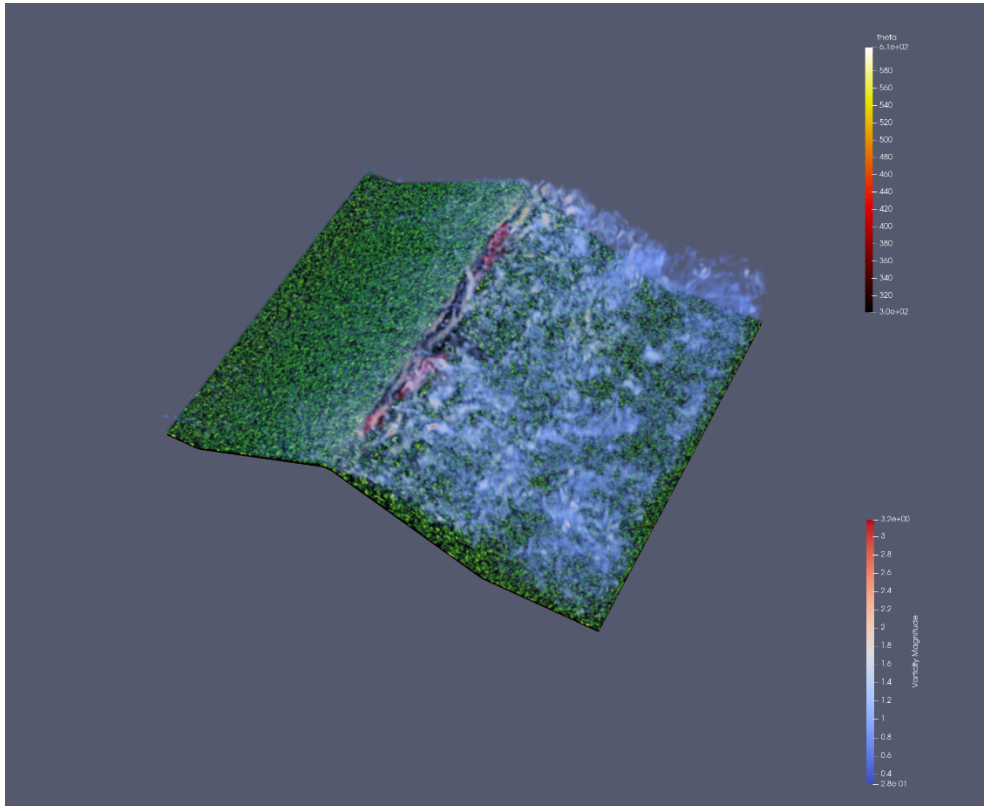
Fire + Watervapor

Results

Velocity Field's Streamlines

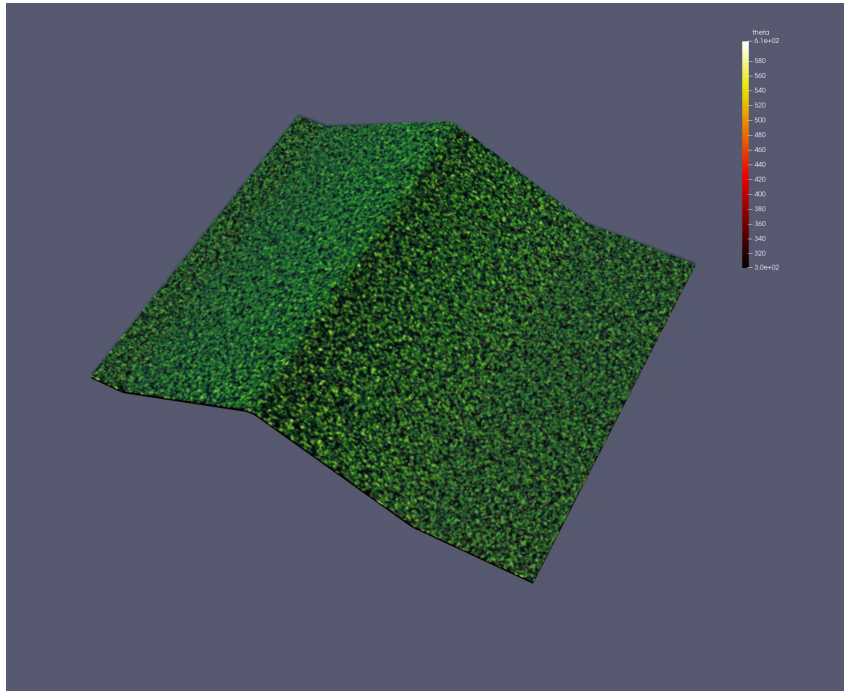
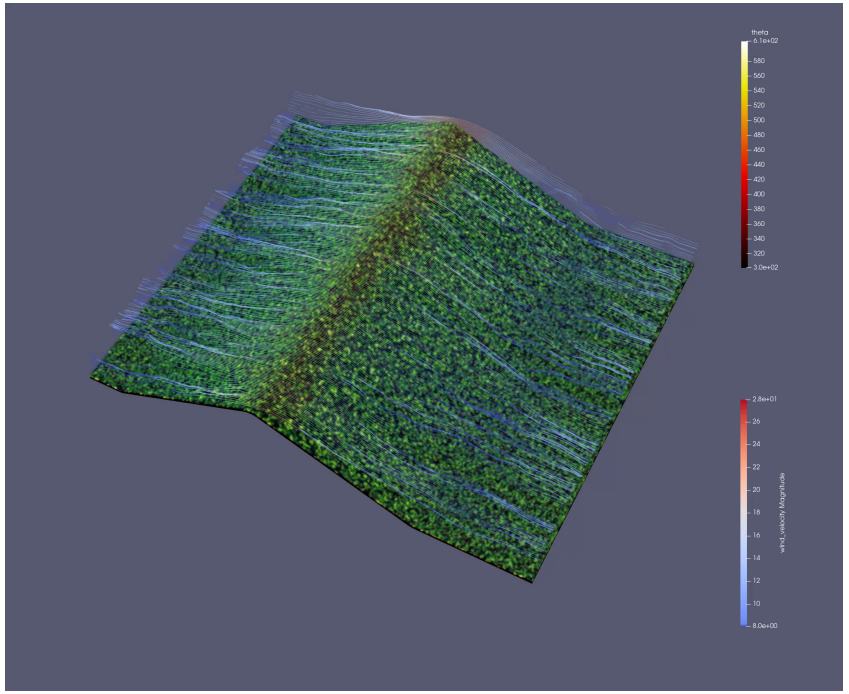
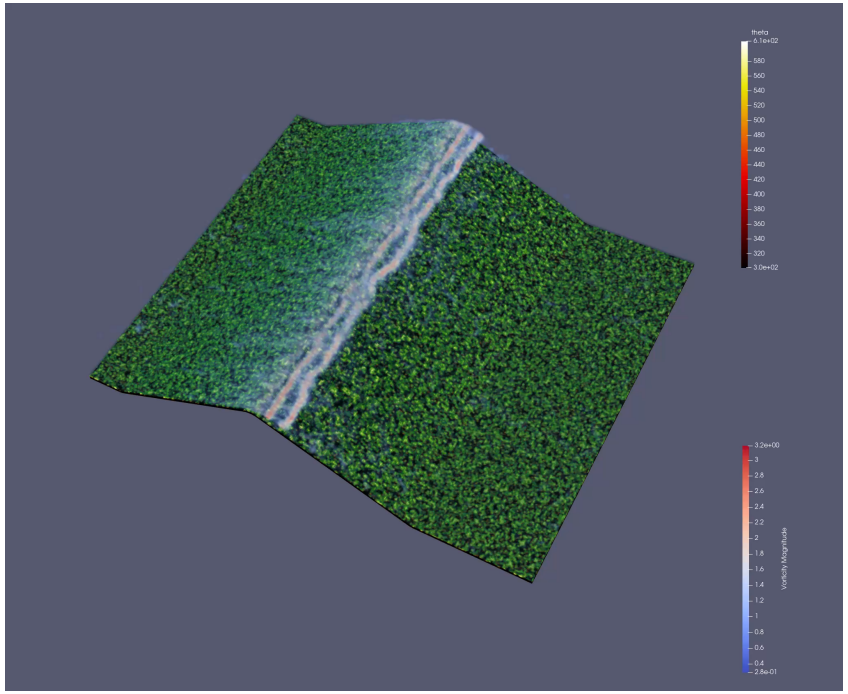


Vorticity Field



Results

- Assemble everything: just fire, with streamlines, and with vorticity fields

Problems / Challenges

- Which challenges have you faced so far?
  - Simplify and keep those elements that are most useful for the visualization goal. Too much information will mess up the scene. For e.g., better to remove vorticity field.
  - Paraview and VTK may have a big difference in form when implementing the same function.
- Is there anything you are currently stuck with?
  - Analyze the causes of VLS from visualization results.
- Does the team work well together?

Timeline

- What do you want to achieve by the final presentation?
  - Isosurfaces: more precise contours of fire, decided by oxygen level and fire-induced heat.
  - Quantitative Analysis: on how terrain and vorticity influence the VLS behavior.
  - VTK Implementation.
- Make a sketch of the remaining timeline.
  - Isosurfaces + full animation: 1 week.
  - Implementing in VTK + Analysis: 1-2 weeks.
  - Report and final presentation slides: < 1 week.
- ~~If you are behind schedule: which items do you prioritize and what might be left out in the end?~~