

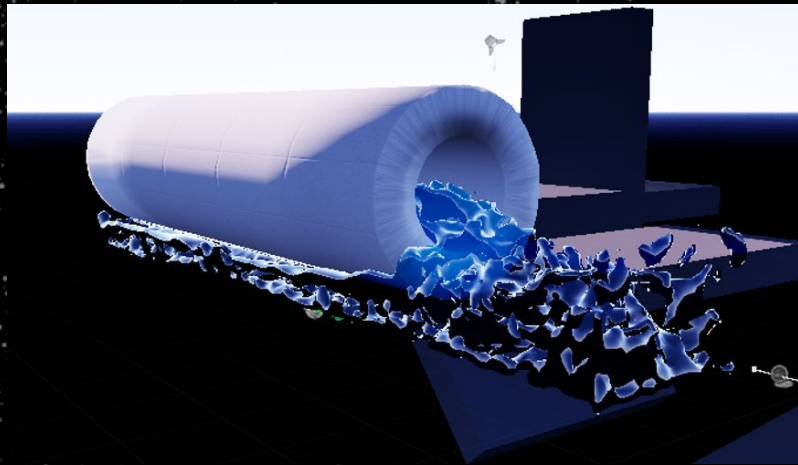
# Fluid Simulation Survey for Unreal Engine

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# Fluid Sim Work

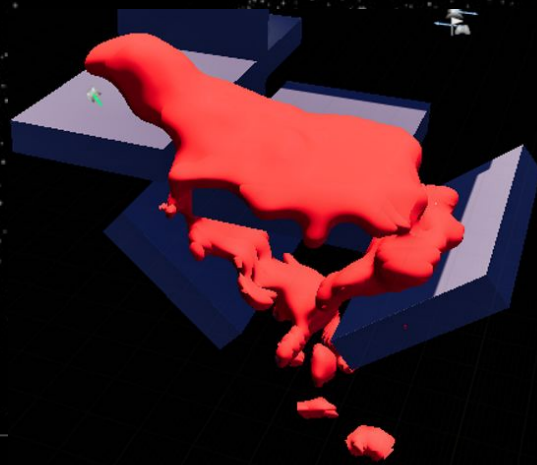
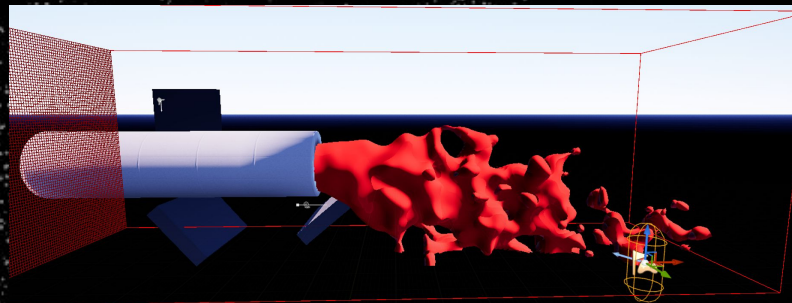
## OBJECTIVES:

- Fluid simulation in Unreal, ideally able to run on mobile hardware
  - Might need to bake or offload some of the compute if it needs to be real time
- UI/UX for demonstrating this technology (focus on touch/mouse, ease of use)
- Extrapolation on tools (“what else can we build to compliment this?”)



# Tools Survey

- Niagara Fluids - what the most research has gone into
  - 5.2 vs 5.6
    - 5.6 has a lot more instability with Niagara Fluids- warnings on compile out of the box
    - 5.2 has better stability but generally fewer features/other optimizations
    - Can be pre-rendered out and then played back to save compute
    - Both run better in DX11- DX12 seems to have bugs
- Unreal Water - pre-baked shallow water simulation- different, but could be used in tandem with other solutions
- Niagara Particles with Collision
  - Granular Flow-type use of meshes
  - Coagulating SDF meshes like the gels in *Portal 2*?



# Tools Survey II

## Havoc - The Legacy Powerhouse

- Source Engine (e.g. *Half-Life 2*, *Portal*) games used a modified Havok, and then swapped to the in-house "Rubikon"
  - Source 1 games run on most any hardware config nowadays
- The elephant in the room: **50k/license for budgets of <\$20 million**



*Half-Life 2 (2004)*

## Nvidia Flow

- Went FOSS in 2025, seems to have community forks but no official implementation in UE5

## Nvidia FleX

- Old, doesn't really work outside older versions of UE4 and Unity



*Nvidia Flow demo*



# Development Progress



# Moving Forward

After this meeting:

- Comments, questions, concerns?
- Next steps/places to focus