

Tom Kwasnitschka  
RD4, Magmatic and Hydrothermal Systems  
GEOMAR Helmholtz Centre for Ocean Research Kiel

# Virtual Fieldwork on the Seafloor: How to get there, what to take home?



# Fieldwork on the Seafloor



fieldwork...

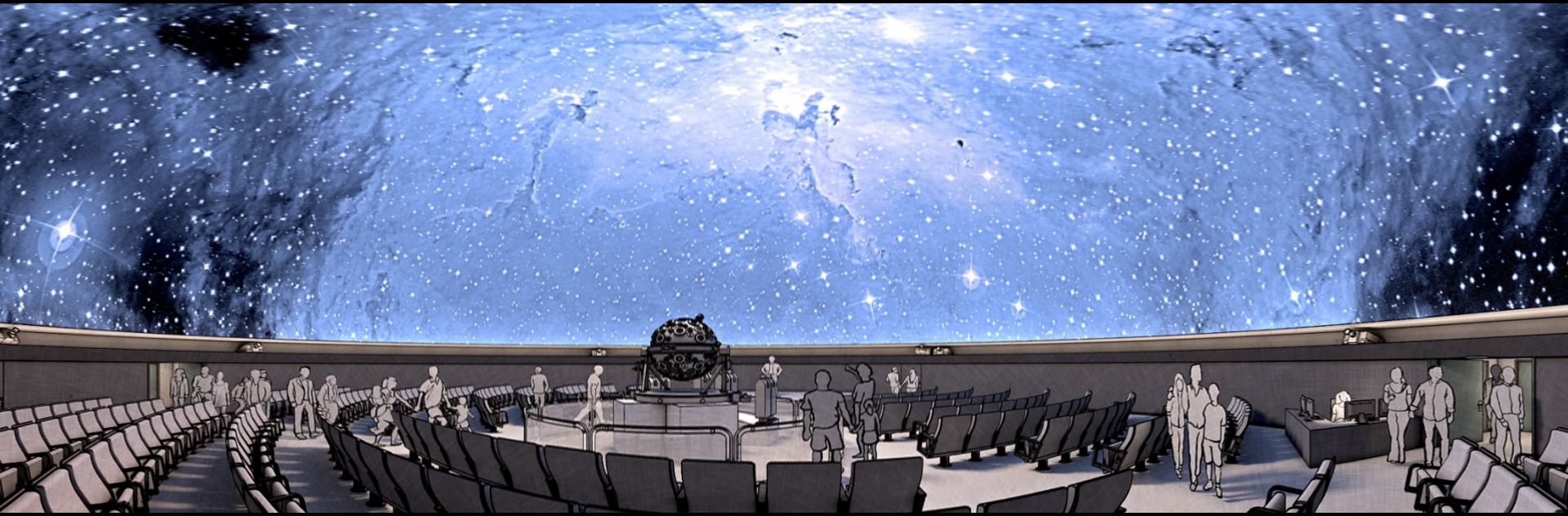
... on the seafloor





# Immersive Visualization

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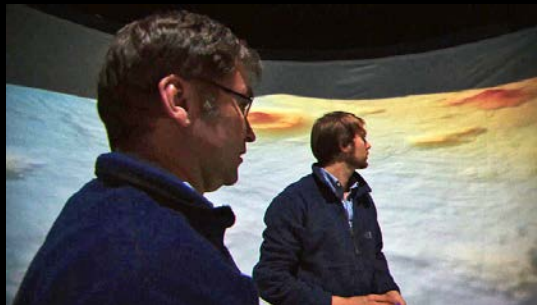
# Goal: integrated in-house Workflow

Doing fieldwork on the seafloor: Photogrammetric techniques to yield 3D visual models from ROV video

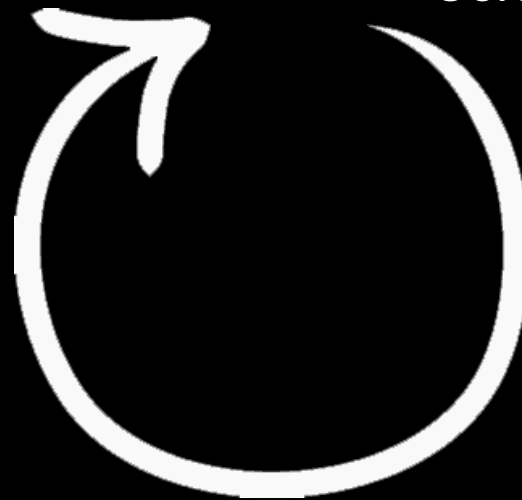
Tom Kwasnitschka\*, Thor H. Hansteen, Colin W. Devey, Steffen Kutterolf

GEOMAR Helmholtz Centre for Ocean Research Kiel, Wischhofstr. 1-3, D-24148 Kiel, Germany

Dissemination



Interpretation



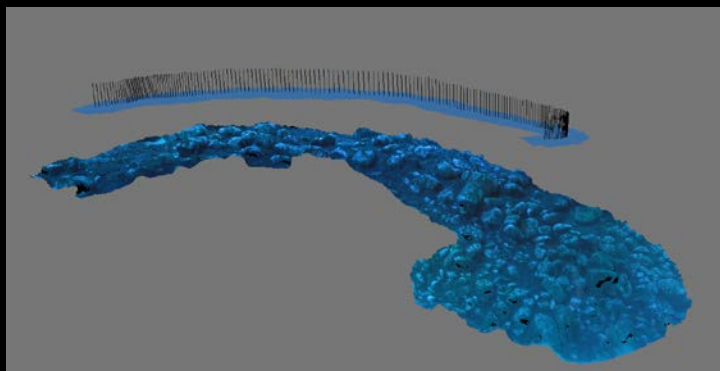
Scientific Idea



Expedition



Post Processing



# Challenges

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*How to examine data  
in lab?*

*How do we plan surveys?*



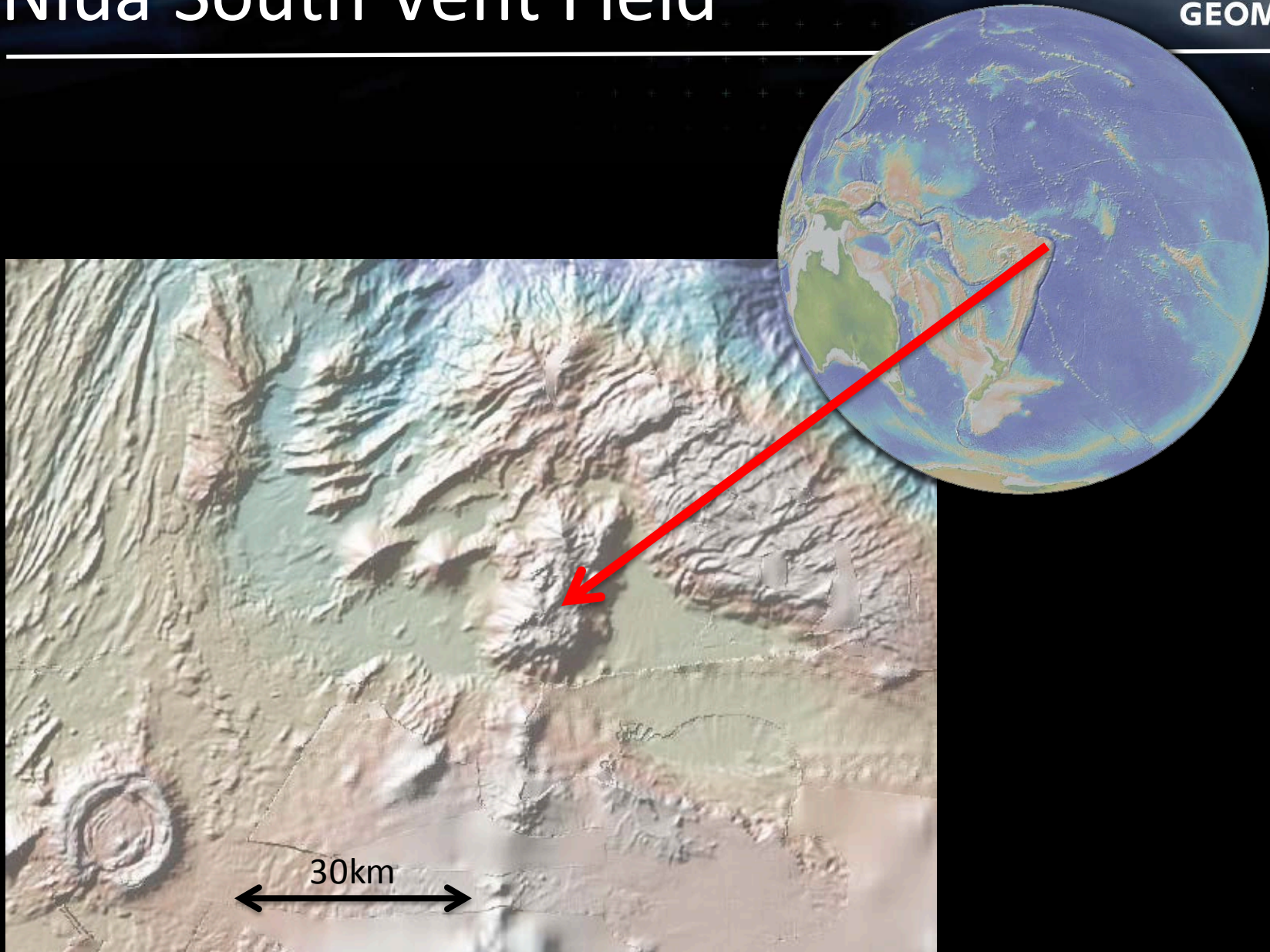
*What equipment  
should we really use?*

*How to engage others  
using telepresence?*

*How to monitor the mapping  
progress in real time?*

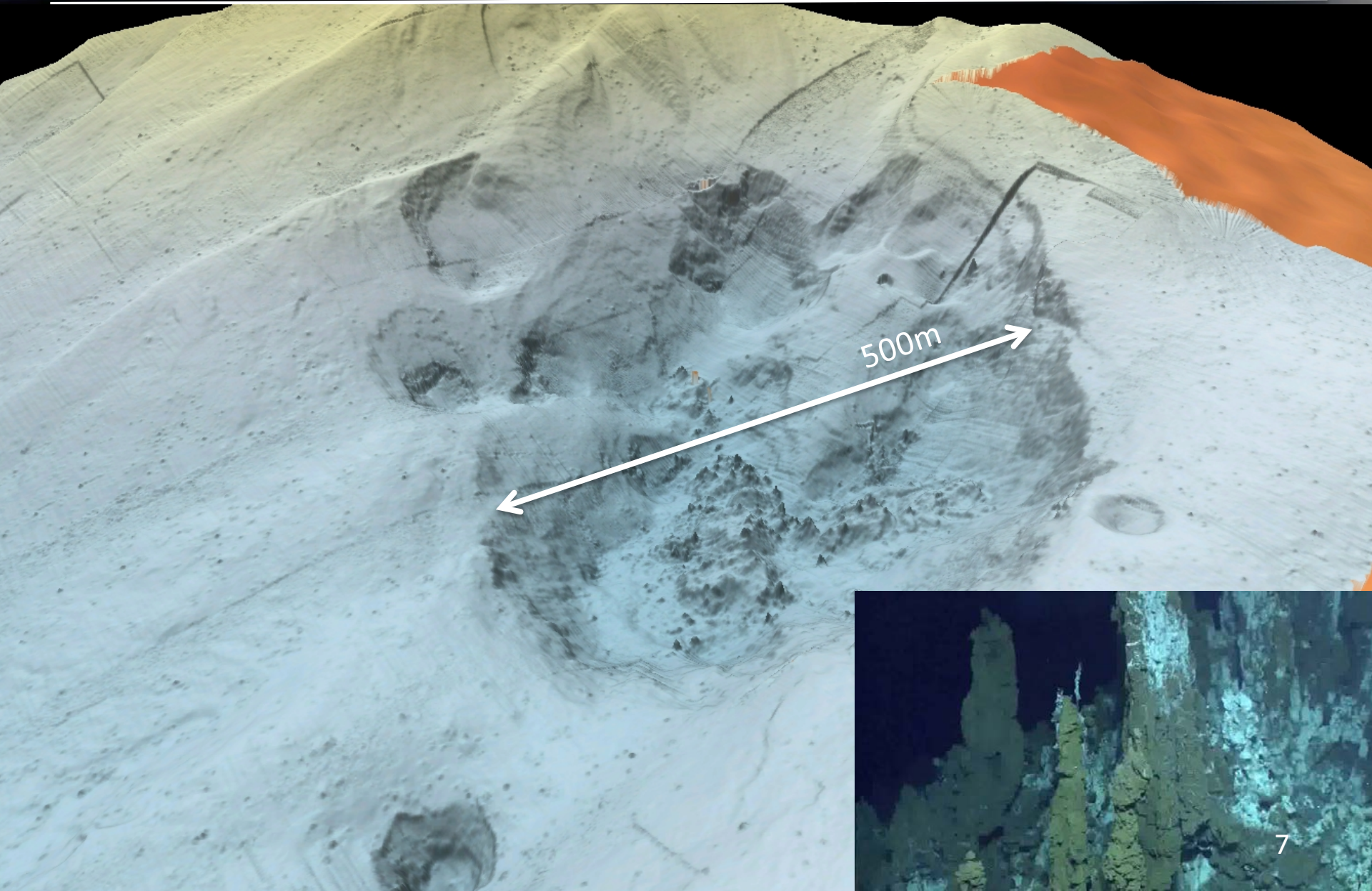


# Niua South Vent Field





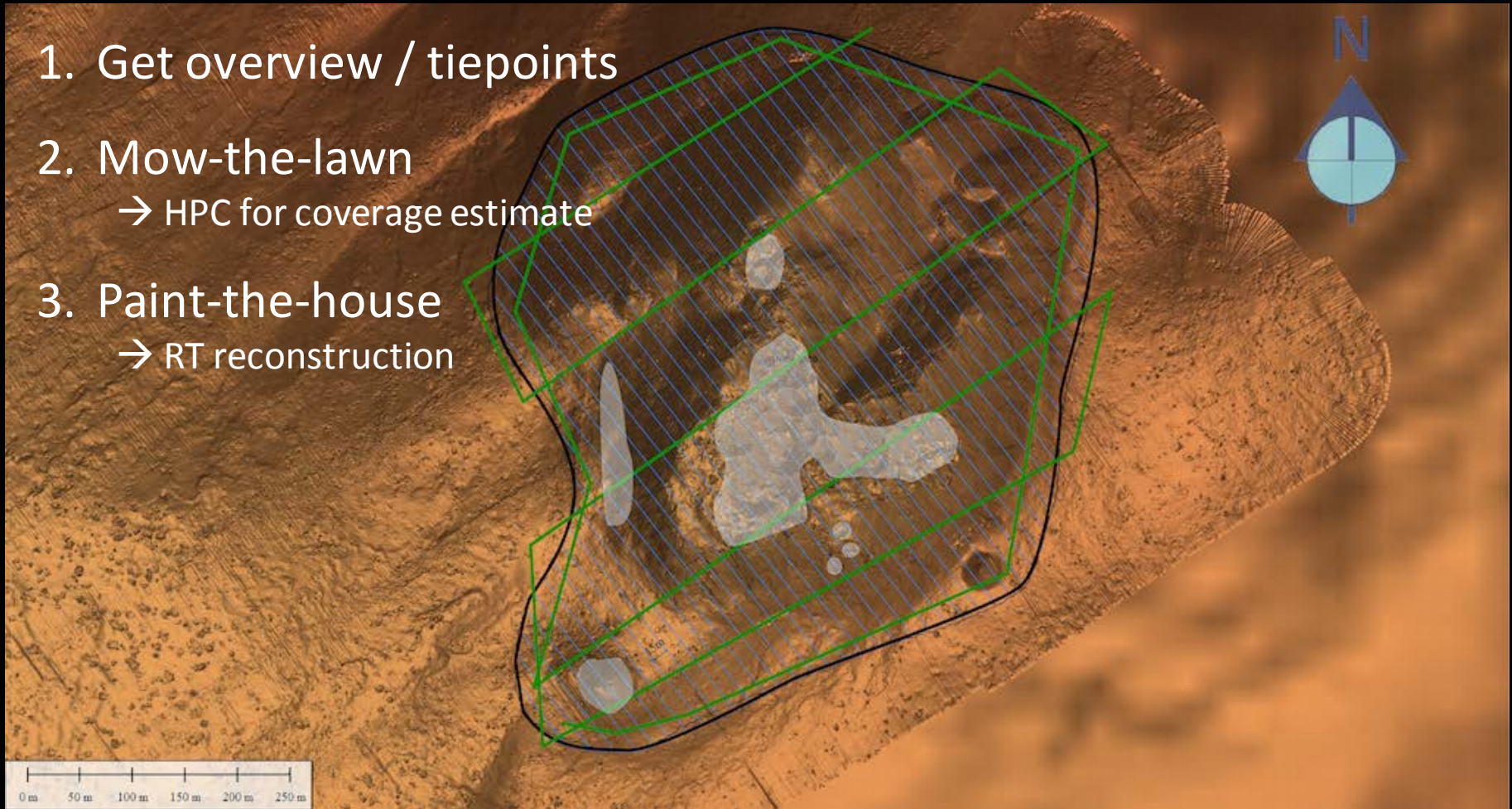
# Niua South Vent Field





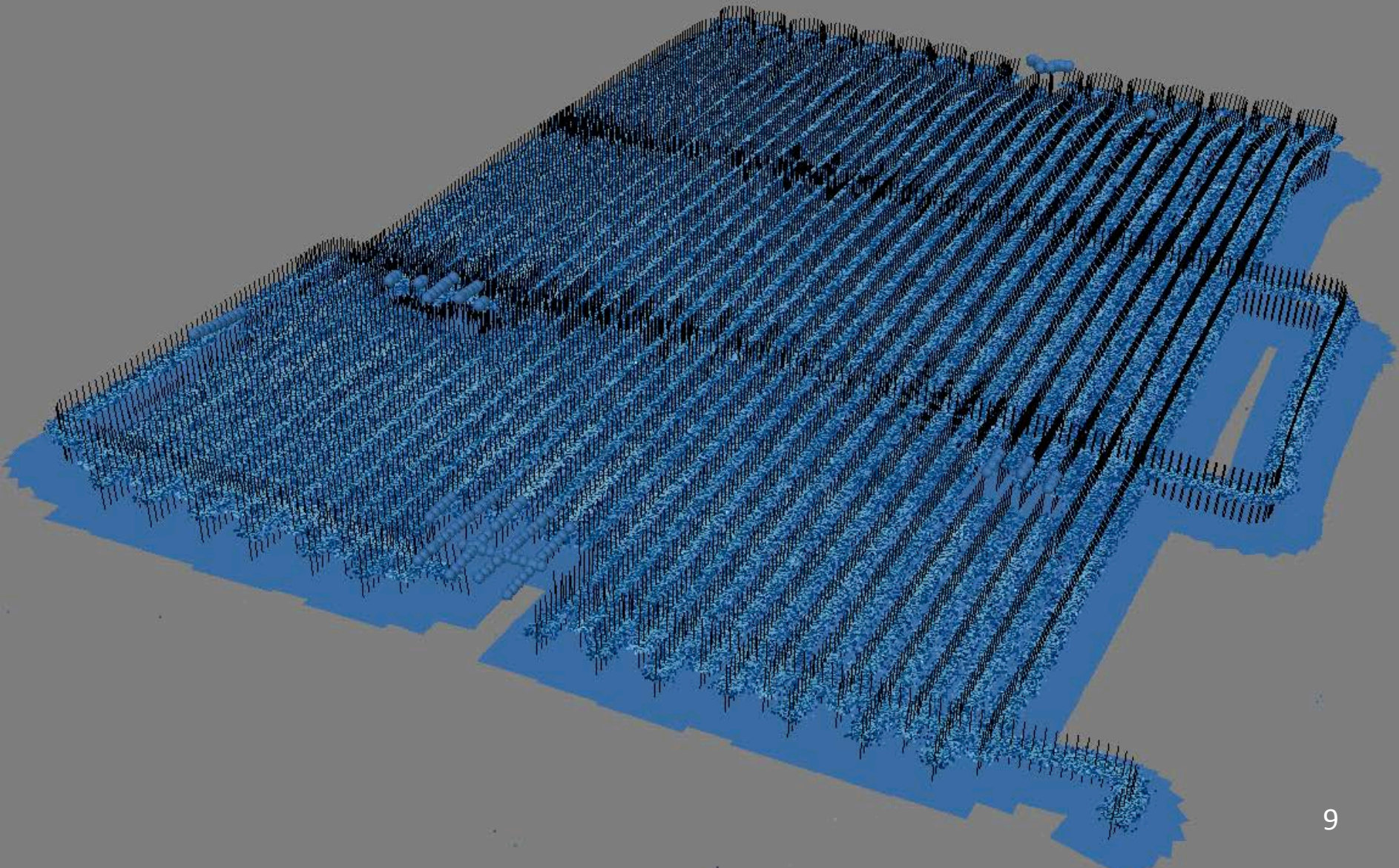
# Survey Strategy

1. Get overview / tiepoints
2. Mow-the-lawn  
→ HPC for coverage estimate
3. Paint-the-house  
→ RT reconstruction





# High Altitude Survey Camera





# High Altitude Survey Camera



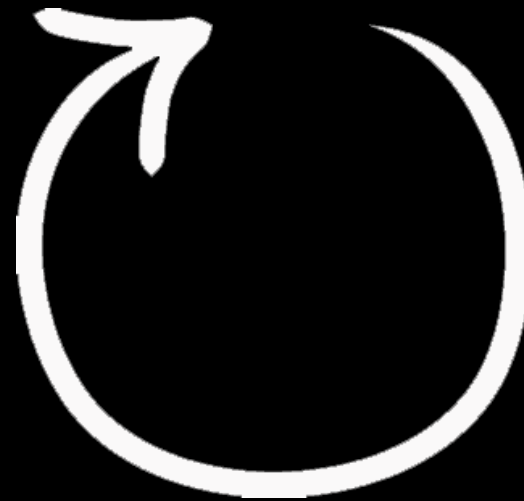


# Immersive Telepresence



# Equipment Summary

*High-altitude SLR camera*



*Telepresence camera*

*LED strobe*

*Stereo camera*  
*Imaging sonar* } *Sensor fusion*



# What is a successful visualization?

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- Creates substantial added value
- Easy to communicate
- Used by many
- Used often
- Easy to integrate
- Low learning curve for users
- Trumps existing tools

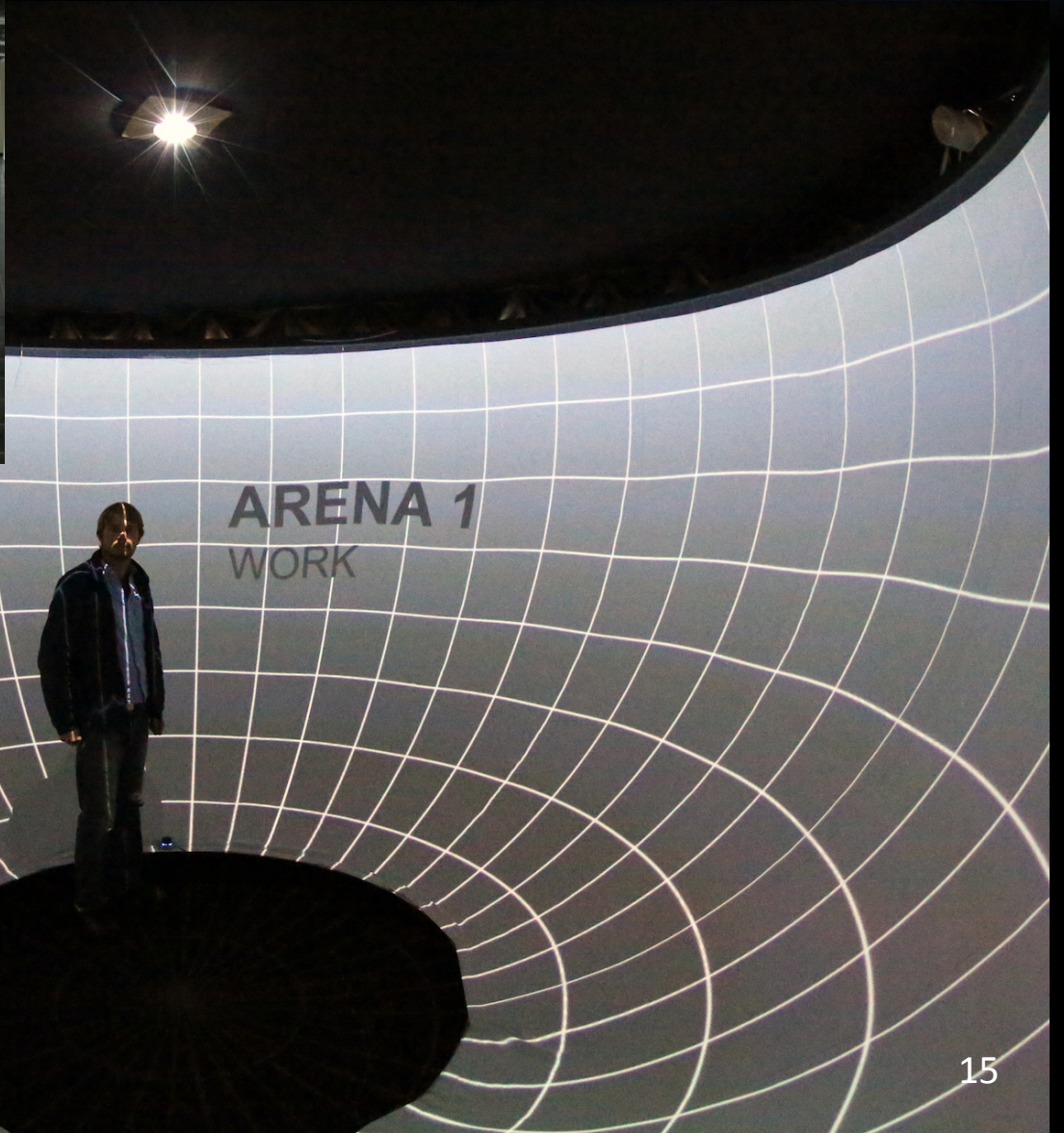
# Object- / Environmentally focused Visualization





# ARENA

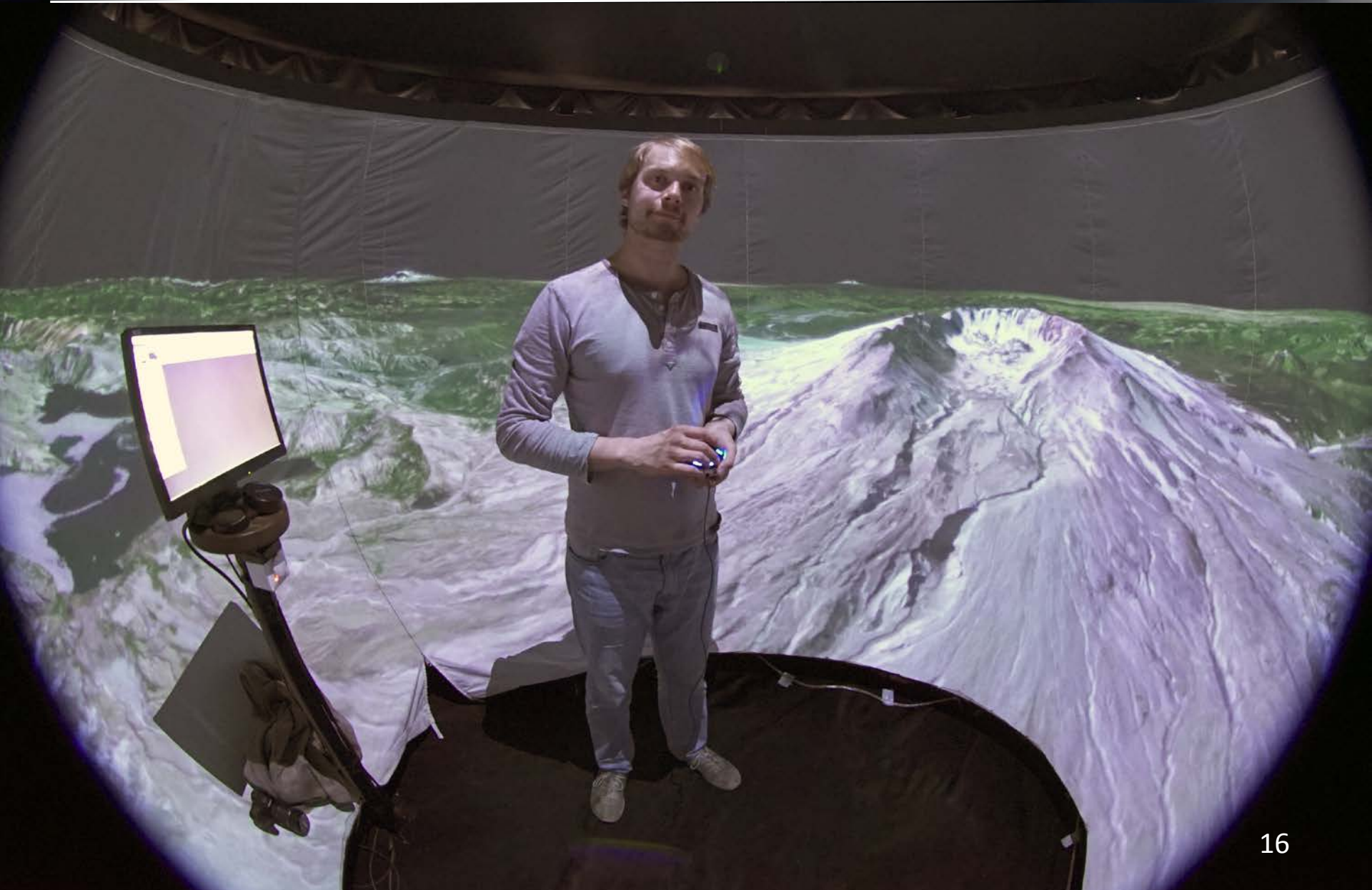
Artificial Research Environment for Networked Analysis





# ARENA

Artificial Research Environment for Networked Analysis





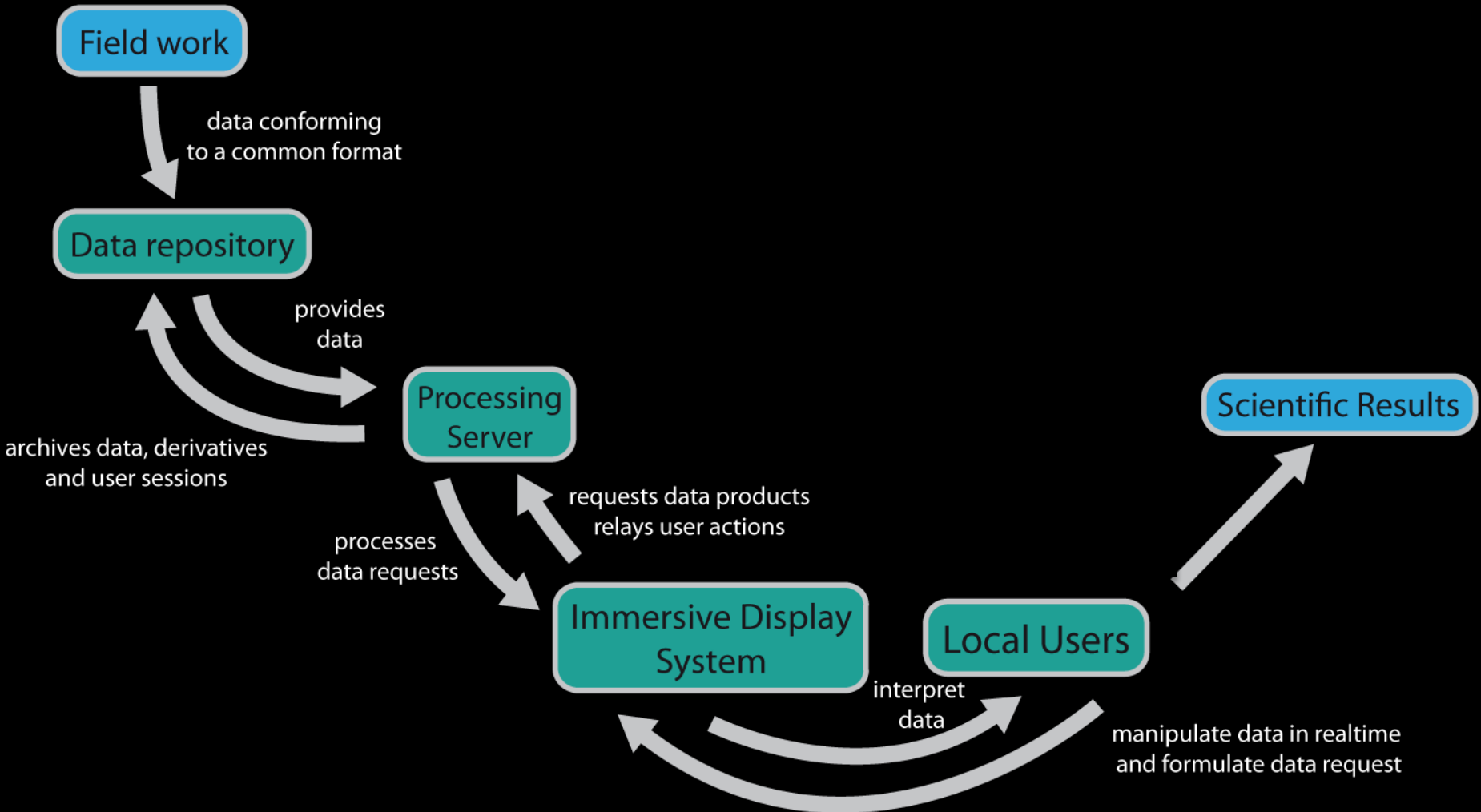
# ARENA

Artificial Research Environment for Networked Analysis

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# Virtual Collaboration





# Virtual Telepresence



# Our goals

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- Ease of use
- Metadata creation
- Interactivity
- Catalyzing scientific dialogue



Many thanks!

