# SenseWeb: Wikipedia of Sensors

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Spatio-Temporal Data Exploration

- Real time and archival data visualization
  - Data eye-balling: snapshots, contour maps, time series charts, time slider
  - Visualizing multiple datasets within collaborative groups
  - Overlay data from different times
- Deployment planning/reconfiguration
  - In-situ and off-line (e.g. using data visualization to determine new sensor addition or change sampling rate)
- Education and outreach

Architecture
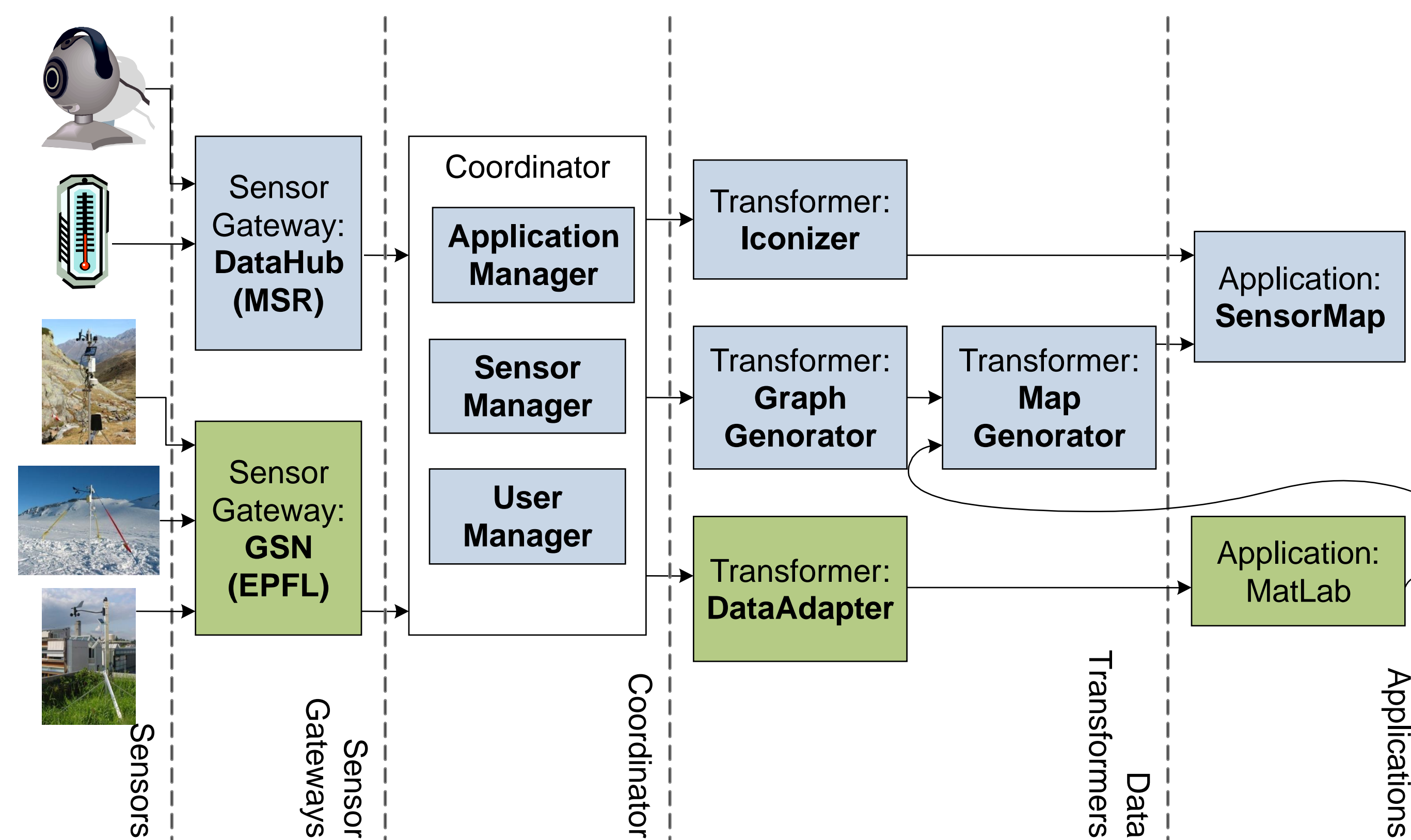
Sharing Sensors/Data

- Share data
  - Same datasets used for multiple analyses
- Share sensors
  - Each scientist deploys at small scale; everyone can use shared instrumentation
  - Larger spatio-temporal coverage than any single system
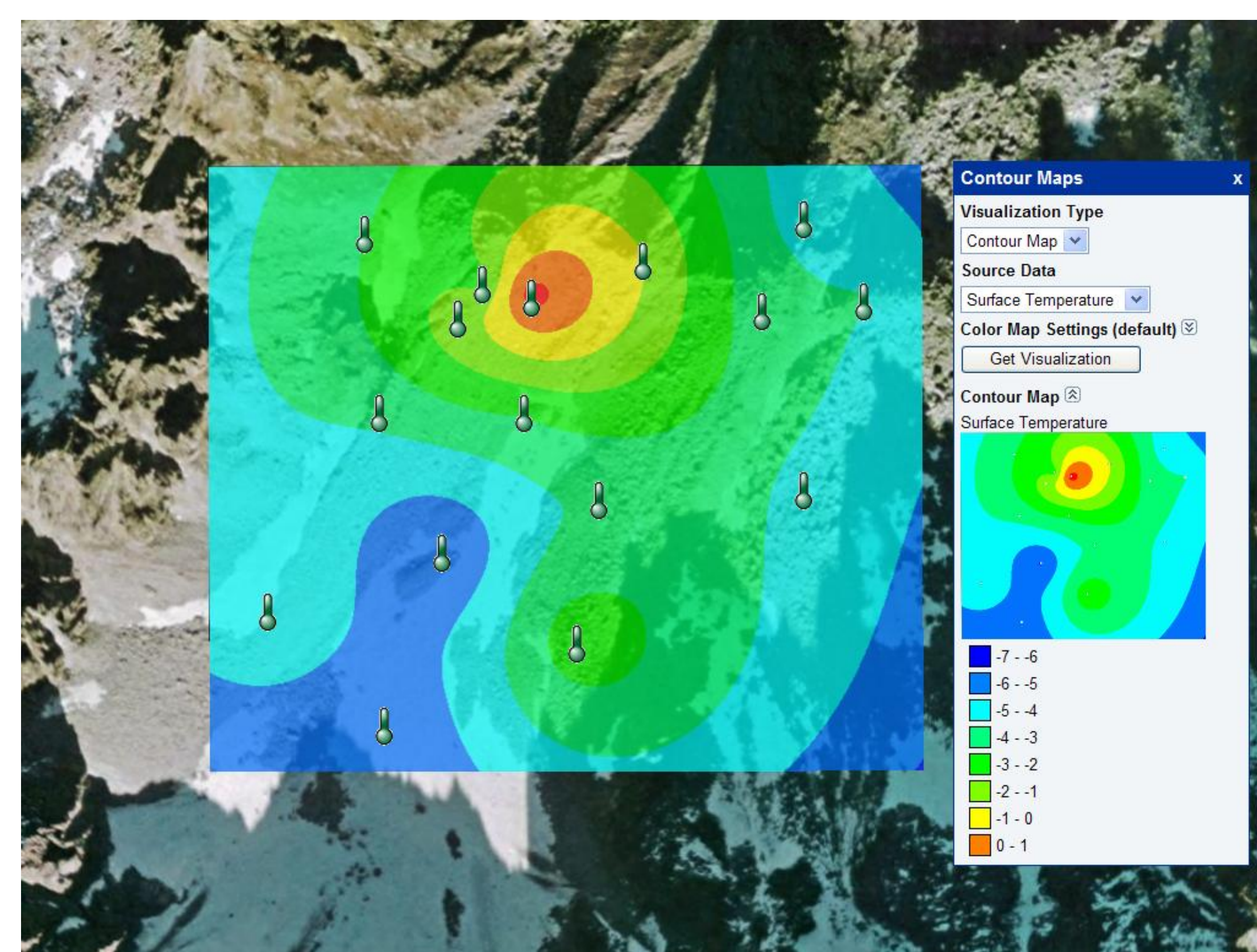 - Costs amortized over multiple experiments

SensorMap: In-Situ Data Visualization Front End

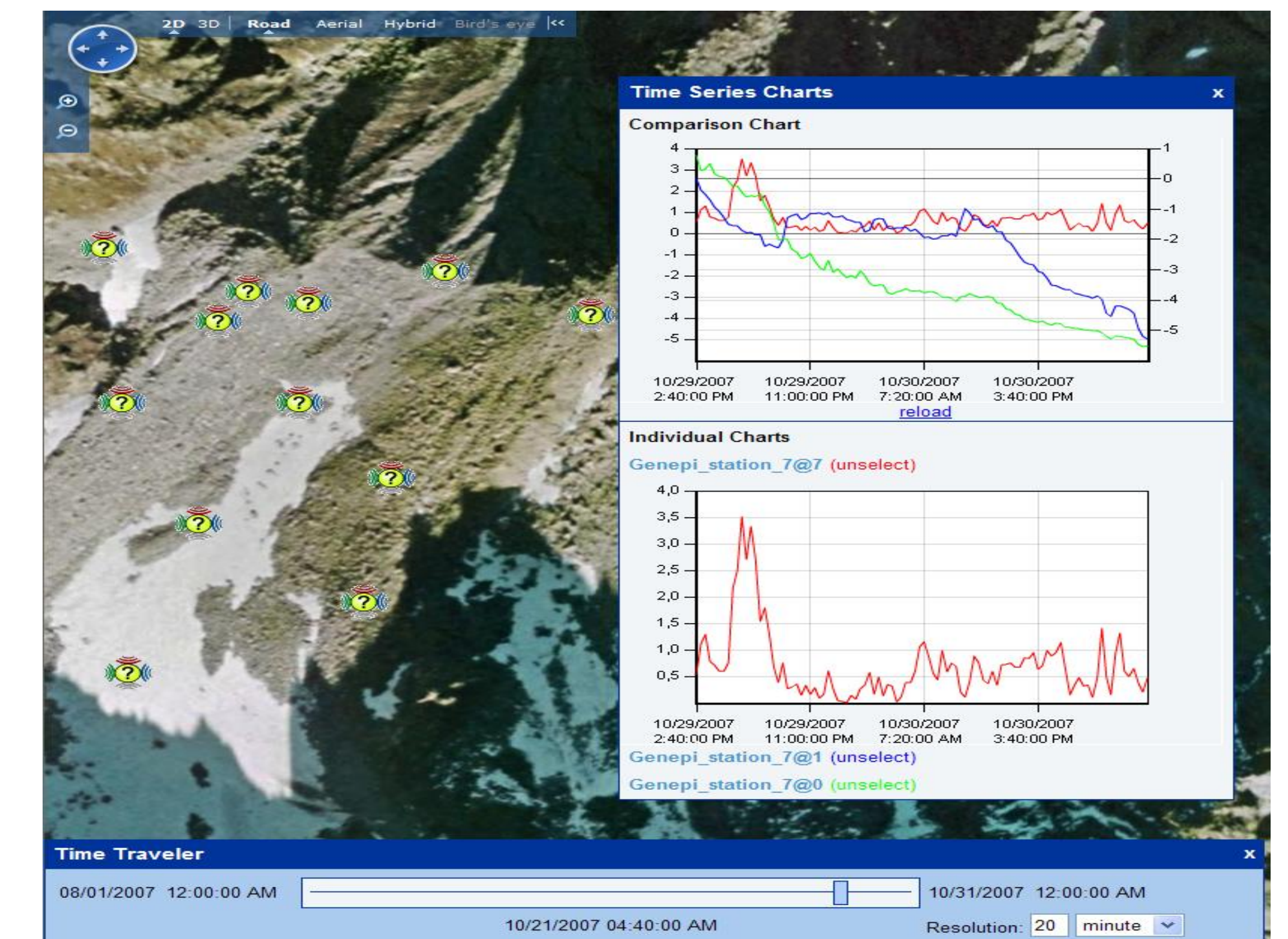Juneau Glacier, Alaska, June, 2007
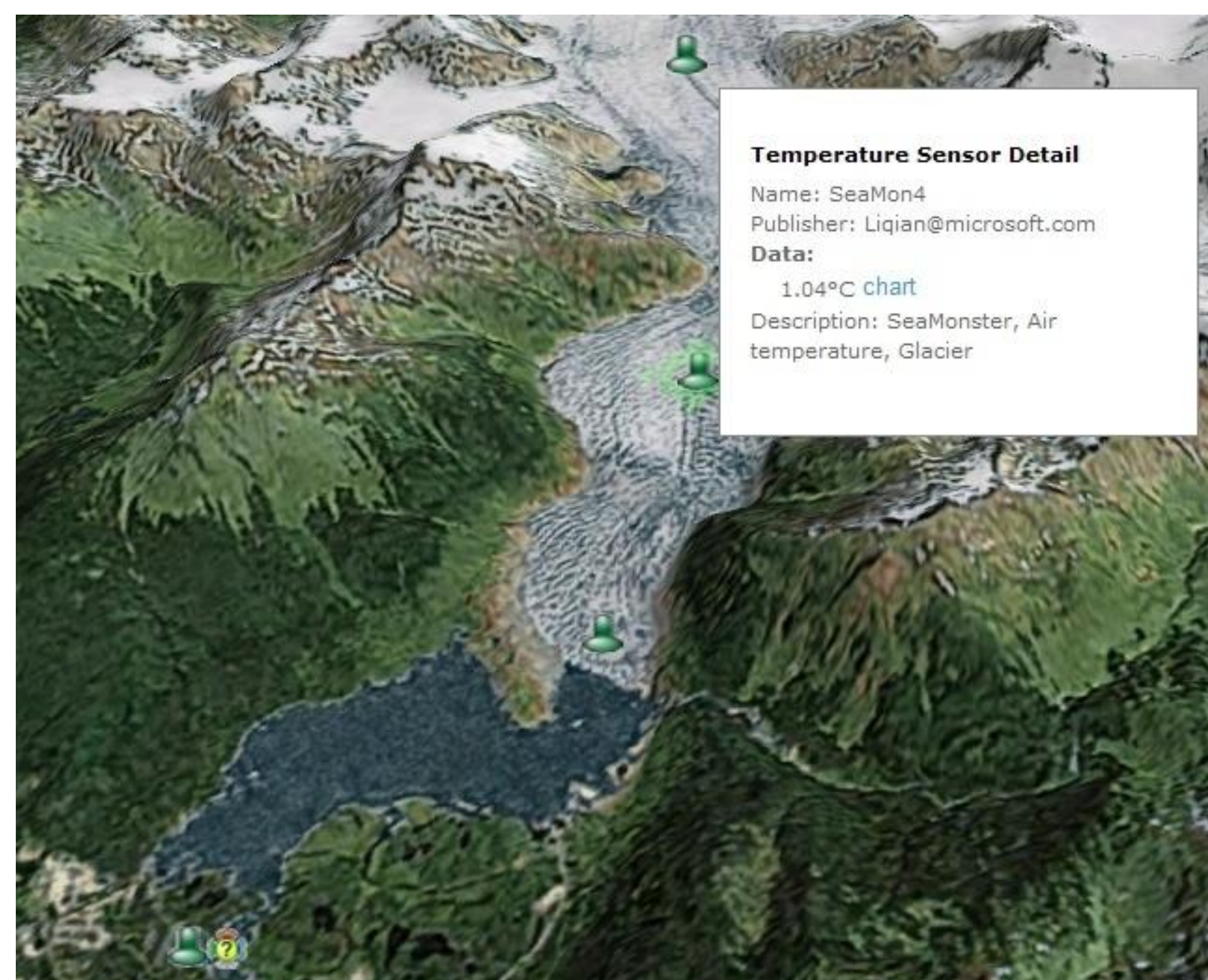
Visualize sensor data over 3D spatial terrain

Genepi Rocky Glacier, Switzerland, August 27 – November 5, 2007

Generate real-time spatial visualizations overlaid on maps, and also over time

Explore temporal visualizations and correlate multiple sensors

Ongoing Research

Scalable query processing at Coordinator

- Share computation across queries
  - Maximal overlapping of computation graph
- Optimal scheduling of data collection
  - Minimal probe Interval-cover graph
  - Linear time algorithm

Untrusted Transformers (e.g., Max)

- Use MAC to prevent inflation
- Use one-way hash chain to prevent deflation
  - Use v'th value of a hash chain for value v
- Combine hash chains of length Max by XOR
- Extending to other aggregates still open

Scalable visualization

- Use models/samples to generate heatmap
- Cache generated visualization
  - Model as a zoom-invariant graph to detect partial overlaps
  - Linear time