Results

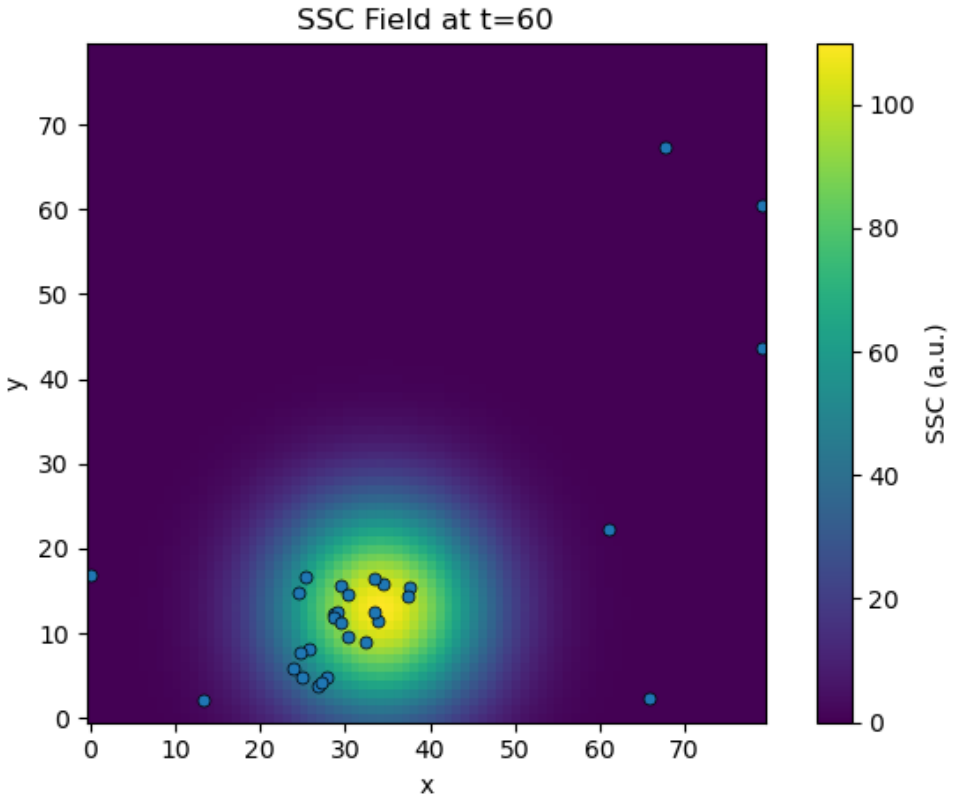

Figure 1. True SSC Field at t=60

Two-dimensional suspended sediment concentration (SSC) field generated using a Gaussian plume model. The plume advects downstream while diffusing and decaying over time. Sensor locations are overlaid to show their spatial distribution relative to the plume center.

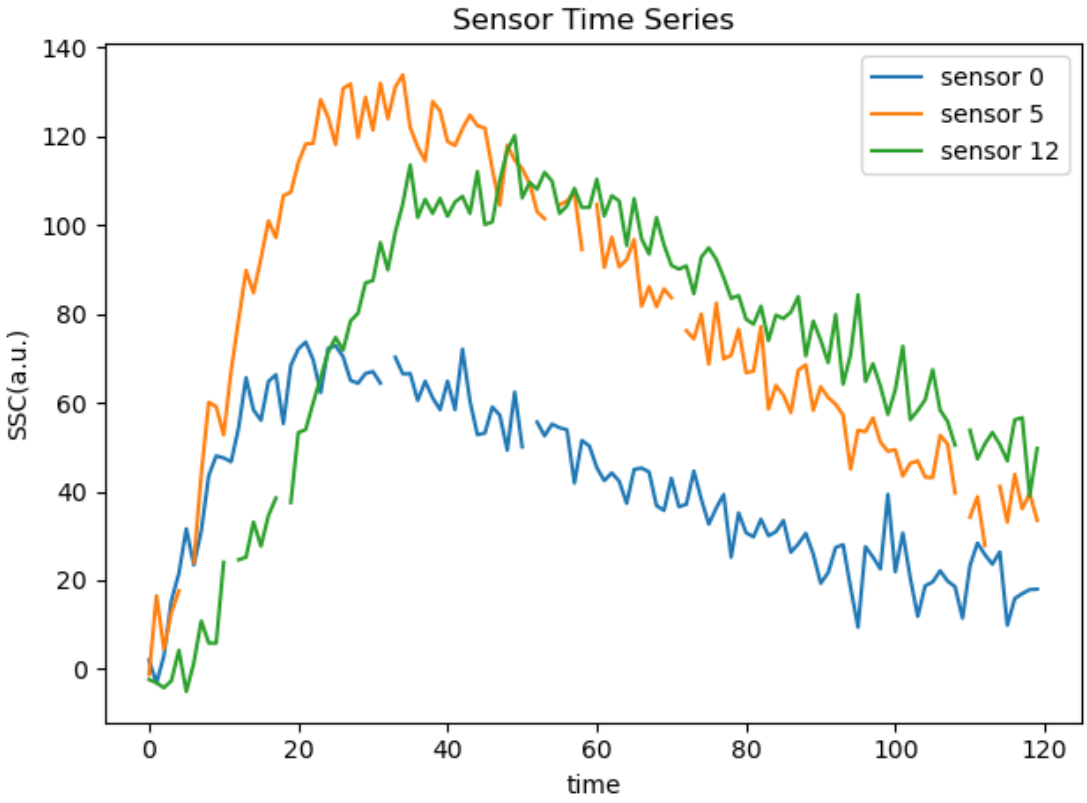

Figure 2. Sparse Noisy Sensor Measurements

Time-series data from three representative sensors. Each sensor captures the plume passage with added Gaussian noise and occasional missing values, reflecting real-world conditions in environmental monitoring.

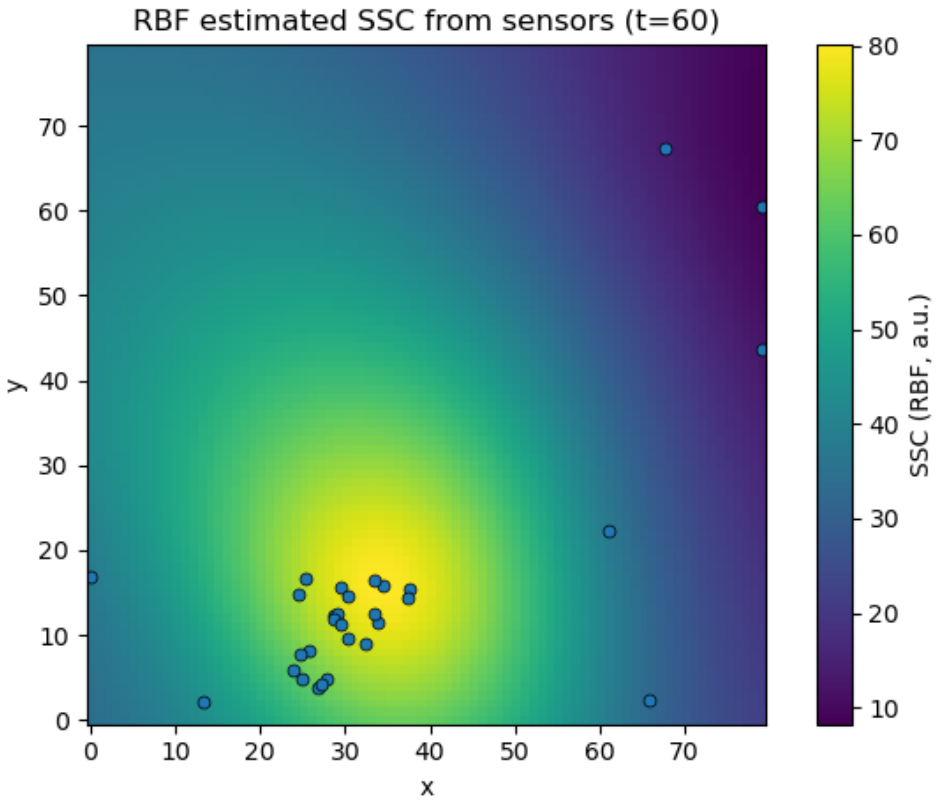

Figure 3. RBF-Reconstructed SSC Field

Reconstructed SSC field at t = 60 using multiquadric radial basis function (RBF) interpolation. Sparse sensor measurements were the sole input, but still yielded effective spatial reconstruction despite the limited sampling density.

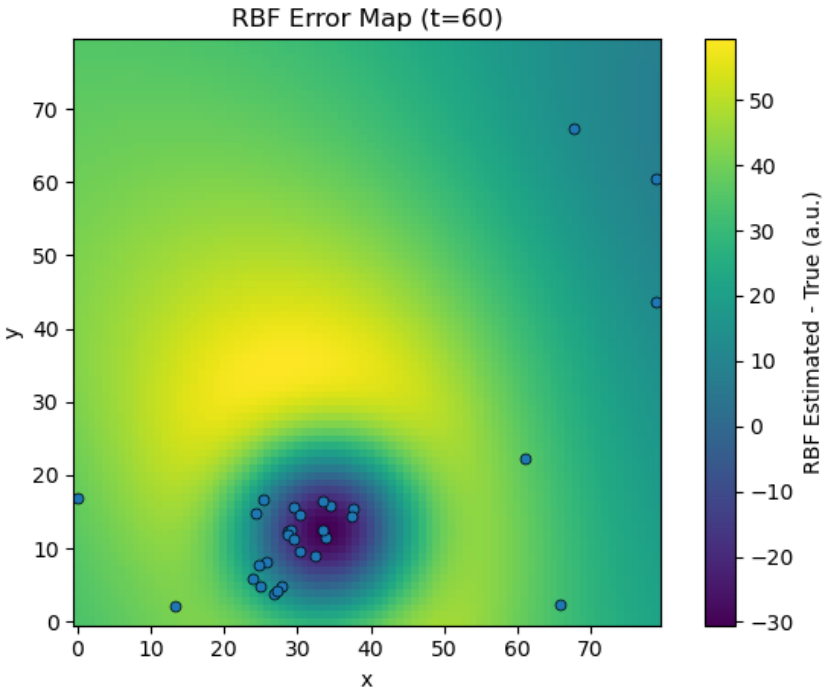

Figure 4. Reconstruction Error Map

Pixel-wise difference between the reconstructed SSC field and the true field. The error is lowest near the sensor and increases farther from the measurement points, revealing the spatial uncertainty of the reconstruction.

Table 1. RMSE, MAE Values

RMSE	36.73
MAE	34.24

With an RMSE of 36.73 and an MAE of 34.24, the reconstruction shows reasonable accuracy relative to the plume's scale and the limited number of sensors.