# Glider Adaptive Sampling and Control

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**Central themes:**

- **Add automatic feedback control for robustness and automation in adaptive sampling.**
- **Take advantage of forecasts of currents to steer gliders efficiently.**
- **Use the glider network as a re-configurable, mobile sensor array.**

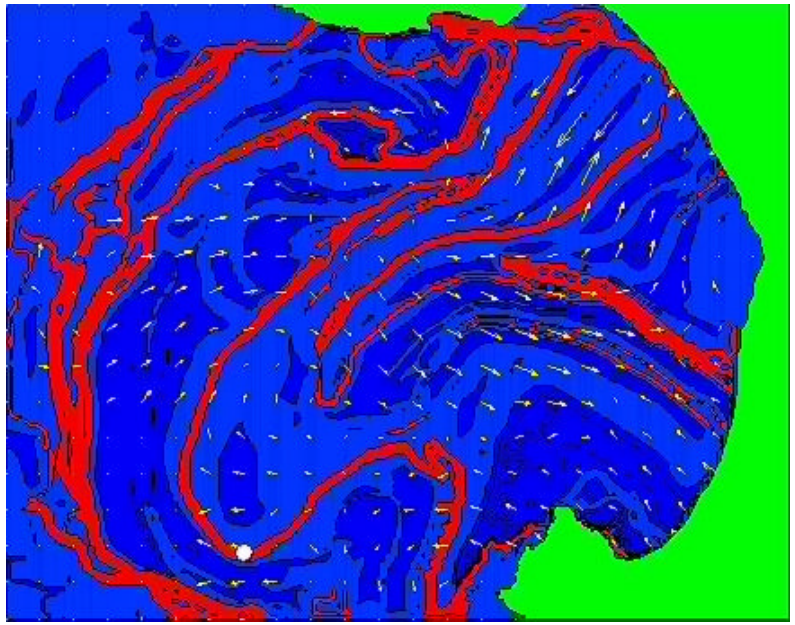
Daily

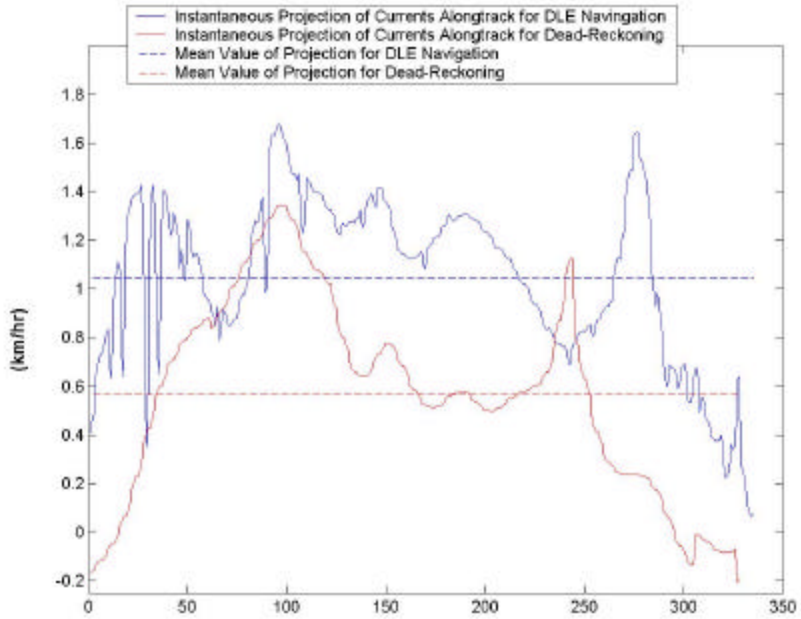
1. Forecasting with HOPS-ESSE and ROMS.
2. An integrated interpretation of the forecasts, forecast errors and dynamical hot spots (physical and/or coupled physical/biological).
3. **Analysis of the circulation fields by Lagrangian Coherent Structures (LCS).**
4. A collective decision by a Real Time Operations Committee ("War Room") as to what features and regions to be adaptively sampled the next day.
5. **The implementation of optimal coordinated motion using feedback control.**

Every two hours

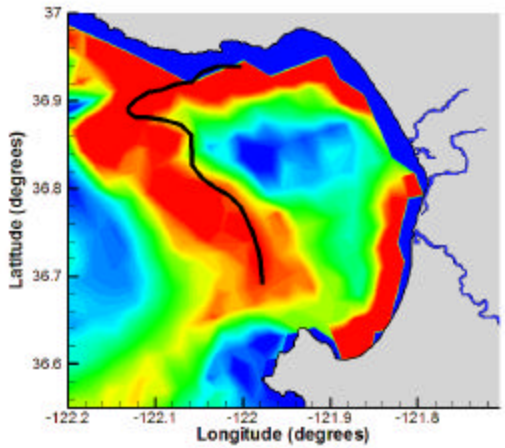



# Analysis of Circulation Fields by Lagrangian Coherent Structures (LCS)



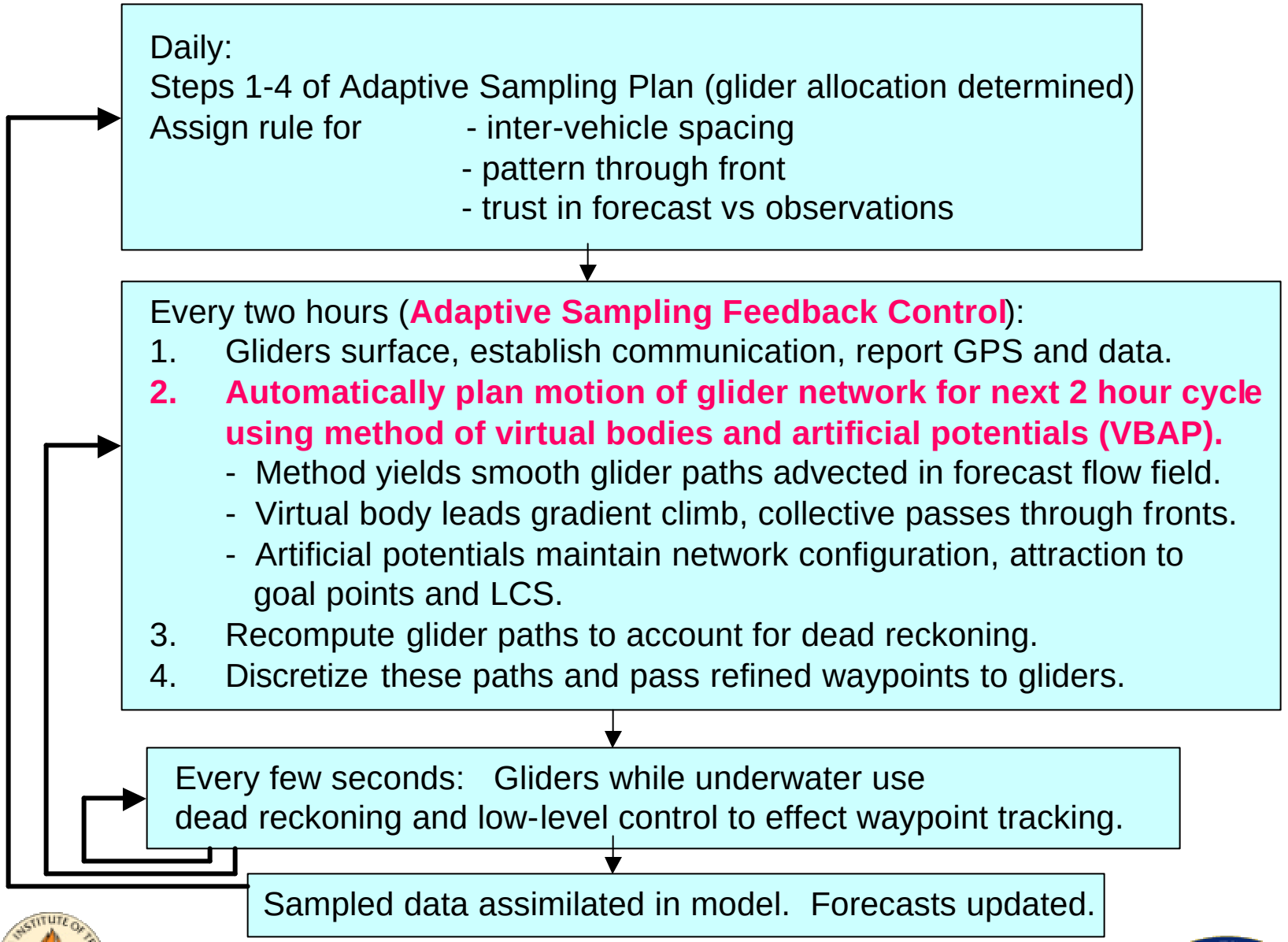



Comparison of navigating along
LCS vs. dead reckoning to goal point.




Superposition of LCS on Temp field (ICON data)

# Optimal Coordinated Motion Using Feedback Control



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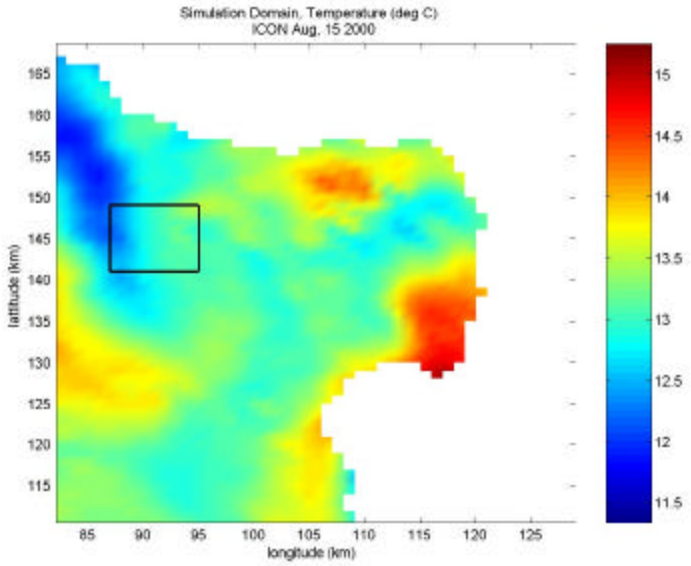
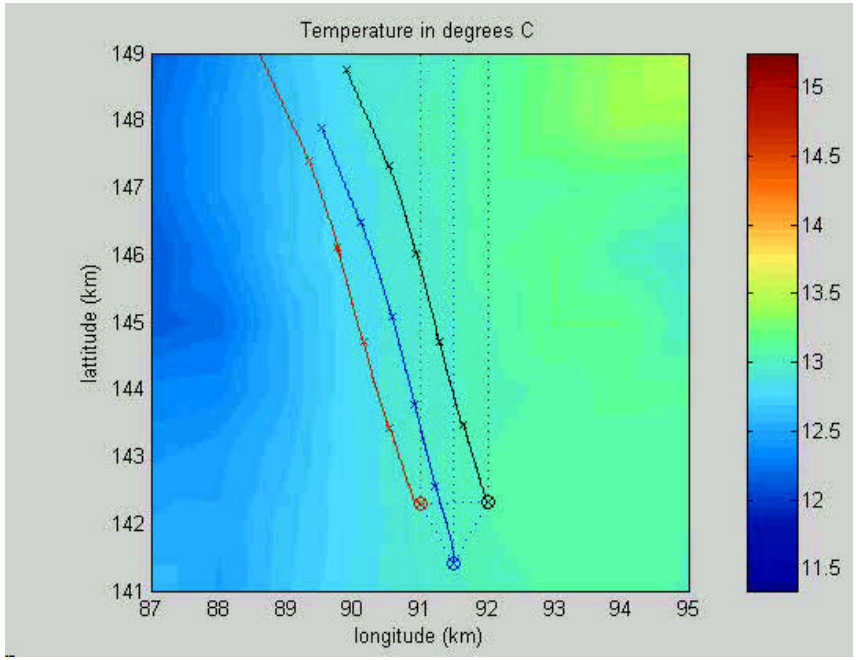
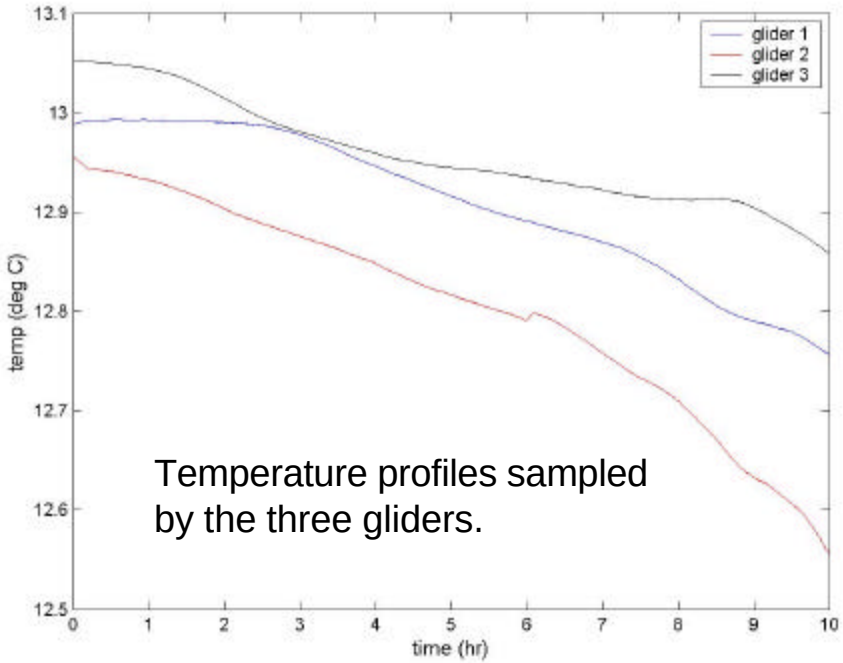



Gradient descent by glider network
to find feature despite error in prediction.




Temperature profiles sampled
by the three gliders.