



Atmospheric monitoring of geological storage of CO₂ at the Otway Basin Pilot Project, Australia

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Monitoring of the atmosphere nearby CO₂ geological storage sites is important to assure operators, regulators and the public that leakage, if any, is within acceptable limits. Detection of leaked CO₂ requires continuous measurements of the concentrations of CO₂ and of natural and introduced tracers that would allow discrimination from the background CO₂ variations. Quantifying the emissions requires flux monitoring (using towers and chambers) and modelling of the atmospheric transport of the leaked emissions and of pre-existing CO₂ emissions (mainly vegetation).

The Otway Basin Pilot Project in Victoria, Australia is a planned demonstration site for the safe injection and storage of CO₂. The storage monitoring program includes comprehensive atmospheric monitoring where composition measurements and modelling techniques are being developed and applied. The initial strategy for Otway was devised from predictive modelling of a hypothetical leak of CO₂ into the atmosphere from both point and diffuse sources with a range of emissions rates. The resulting plume was simulated by the CSIRO dispersion model "TAPM" at scales of 100 – 500 m and by a Lagrangian dispersion model "WindTrax" at scales of 0 – 100 m. The particular advantages of the Otway site for atmospheric monitoring include being close to the coast and in a rural location with few confounding gas sources. Ground-based observation points were located to optimize the signal strength and the likelihood of being within the simulated plume. An objective is to improve the sensitivity of atmo-

spheric monitoring to detect and quantify leakage that could compromise a typical geosequestration storage, within a naturally varying CO₂ background. Preliminary results from both the atmospheric monitoring and modelling studies of the Otway project will be presented.