

CDM Groundwater Modeling Studies - DYNSTEM Applications

Project	State or Country	Date	Description
Luxor Groundwater Lowering	Egypt	2007 - 2009	Develop and calibrate model of Nile River west bank floodplain at Luxor. Simulate drainage trench and well systems to lower groundwater in vicinity of major archaeological to protect structures and facilitate explorations.
Puchack Well Field	NJ	2007 - 2009	Develop and calibrate local model of contaminant source area. Simulate the injection, transport and reaction/consumption of alternative amendments to inhibit chromium migration. Density driven coupled flow-transport (DYNCFT) applied for heavier than water amendments.
Illinois EPA SE Rockford Area 7 Remedial Design	IL	2007 - 2008	Update, refine and recalibrate SE Rockford regional DYNFLOW model based on new borings and pumping tests in Area 7. Simulate alternative remedial pumping configurations and pumping rates. Use DYNTRACK to compute capture zones.
NGC Hawthorne Site	CA	2007	Develop simple upper aquifer model and calibrate to site pumping test. Apply model to design upgradient pumping to reduce the flow of cool groundwater into the thermal remediation treatment zone to enhance treatment efficiency.
Clariant Site	NJ	2007	Update and recalibrate previous site model based on significant new data and remedial pumping history. Apply UCODE parameter estimation package with DYNFLOW during calibration. Simulate proposed slurry wall and remedial pumping modifications.
Illinois EPA SE Rockford Area 4 Remedial Design	IL	2006	Update, refine and recalibrate SE Rockford regional DYNFLOW model based on new borings and pumping tests in Area 4. Simulate alternative remedial pumping configurations and pumping rates. Use DYNTRACK to compute capture zones.
Fresno Sanitary Landfill	CA	2005 - 2006	Transient flow model evaluation of landfill plume, contaminant fate, risk assessment support, and evaluation of remedial alternatives.
Sanannah Harbor	GA	2005 - 2006	Developed detailed representation of Savannah harbor within GA coastal regional model. Use DYNCFT for coupled flow-transport modeling of downward migration of salt water from surface to Upper Floridan aquifer. Calibrate model to measured groundwater salinity data and water levels. Apply model to assess impact of proposed harbor dredging on salt water migration.

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Industrial Site	NY	2004 - 2009	Transient groundwater flow model of Queens/Nassau/Western Suffolk used to simulate 1940 to present groundwater flow patterns, and potential chlorinated solvent and Freon plume migration pathways in Magothy and Lloyd aquifers. Assist client and regulators with water supply management decisions and public outreach.
Pomona (PVPA)	CA	2004 - 2006	Update DYNFLOW integrated groundwater-surface water model based on new boring, well and spreading data. Make hundreds of simulations to assess alternative spreading and pumping schedules designed to increase spreading and prevent groundwater flooding. Model results also used to develop spreadsheet tool to help guide spreading operations.
Puente Valley-San Gabriel Valley	CA	2003 - 2006	Separate DYNFLOW models combined into one model to evaluate mass transport and groundwater remediation alternatives. Models were combined because area of interest was close to original model boundary. New programs developed to facilitate appending distinct models.
HASEKO (Ewa)	HI	2003	In 2003, the model was updated and refined to incorporate data collected by Haseko during past 9 years. DYNWIM was used simulate groundwater flow in this coastal aquifer setting. Detailed tidal cycles were simulated for various time periods.
Litigation Client	CA	2002	Groundwater and mass transport models developed in support of litigation case. Transient simulations of groundwater flow and BTEX transport from multiple potential source areas were performed to evaluate migration pathways and travel times to downgradient receptors.
Mass Environmental Associates Inc	MA	2002	Groundwater flow model developed in support of Comprehensive Site Assessment and Corrective Action Alternative Analysis performed as part of landfill closure activities. The groundwater flow model was used to evaluate various landfill closure scenarios.
Industrial Facility	MA	2001 - 2002	Groundwater flow and transport modeling of both the overburden and fractured bedrock aquifers performed as part of MCP site assessment and feasibility studies. Transport modeling includes potential migration of PCB congeners as well as VOC fate and transport.

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Litigation Client	CA	2000 - 2003	Transient groundwater flow and mass transport over a 40-year period, with varying pumping and spreading stresses, were simulated to analyze the migration of DCE and TCA plumes from an industrial site and to evaluate groundwater quality at a downgradient wells.
Litigation Client	CA	2000 - 2002	Transient groundwater flow and mass transport models were developed to analyze multiple hexavalent chromium and TCE plumes from neighboring industrial sites and to evaluate the potential groundwater flow impacts on off-site groundwater treatment systems.
San Joaquin	CA	2000	Regional groundwater flow model developed for master plan to reduce drawdown cone and saline intrusion in Stockton, CA area. The San Joaquin model was the first implementation of enhanced river and agricultural management modeling modules of DYNFLOW.
Opel-Werk Rüsselsheim/Opel General Motors	Germany	2000	Simulation of a solvent plume threatening a groundwater production area with intricate geology supported pump-and-treat optimization and siting and dimensioning of a new extraction well near the toe of the plume.
Truckee Meadows	NV	2000	Development and calibration of regional groundwater flow model. Transient groundwater flow conditions, including temporal changes in recharge, pumping and surface water features, were simulated over a 40-year period.
Industrial Site	FL	1999 - 2003	Groundwater modeling was performed in support of groundwater remediation design at four hazardous waste landfills. The modeling consisted of development and application of a three-dimensional groundwater model.
TRW - Lafayette	IN	1999 - 2000	Flow and transport modeling to estimate potential impact at downgradient water supply wells of low level VOC (chlorinated solvents) concentrations remaining after site remediation. Modeling results supported successful case for site closure.
Plum Island	MA	1999 - 2000	Barrier island DYNWIM simulations for evaluating impacts of water supply centralized pumping and wastewater collection system implementation. Helped define areas of high water table problems, and best locations for water/wastewater system components.
Fuel Terminal	CA	1999	Developed local flow and transport models to assist design of groundwater pumping system to contain and remove MTBE contamination.

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Industrial Client	CA	1999	Groundwater flow and mass transport analysis performed to evaluate the migration of PCE and TCE downgradient of several industrial sources.
Mönchen-Gladbach Kläranlage	Germany	1999	City of Mönchen-Gladbach. In support of the design for the expansion of waste water treatment plant, DYNFLOW was applied to provide information about groundwater damming for structure buoyancy calculations.
Stadtbahn Tunnel Leipzig	Germany	1999	Deutsche Bahn. Existing finite difference groundwater model for the city of Leipzig was not suitable to calculate dimensions and intervals of groundwater bypasses in the design of aquifer-blocking tunnel linking two major railway stations in Leipzig.
Coastal Georgia	GA	1998 - 2009	Review of existing regional flow models developed by the USGS for the GA EPD. Updating the models for saltwater intrusion analyses.
Industrial Site	NY	1998 - 2003	Models of groundwater flow and chlorinated solvents transport used to estimate potential future impacts and evaluate remedial pumping alternatives. Local model was linked to the Nassau County regional DYNFLOW model.
Industrial Site	CO	1998 - 1999	Developed flow and transport models to evaluate effectiveness of a funnel and gate in-site groundwater treatment system using zero-valence iron.
Walton County	FL	1998 - 1999	Regional flow and saltwater intrusion (DYNSWIM) modeling in support of Northwest Florida Water Management District permitting of a new water supply well field in near-coastal zone. Local DYNTRACK simulations were also conducted at an alternative well site
Valparaiso	IN	1998 - 1999	Model of saltwater migration from a highway maintenance facility towards a municipal well field. DYNSWIM and DYNTRACK were linked to account for density driven flow of a deep saltwater plume, and dispersion of salt from the plume into surrounding groundwater.
Industrial Facility	GA	1998	Site specific flow and mass transport model in support of litigation. Fate and transport of TCA and TCE of primary concern.
Ilseeder Hütte; Stadt Ilseede	Netherlands	1998	Remedial scheme optimization aimed at containment of contaminated groundwater at a former steel mill. Partial and complete enclosure by slurry walls was modeled to determine optimal pumping rates and risk management.

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Industrial Facility	NV	1998	A complex transient and steady-state flow model of a steep alluvial valley in mountainous terrain. Used to assess present plume migration, and to site supplementary remedial pumping wells.
Pomona	CA	1997 - 2001	Conversion of Pomona Valley regional model to DYNFLOW with revision of stratigraphy and boundary conditions. Incorporated soil and unsaturated zone computations to calculate recharge based on soil, land use, E-T, rainfall, agricultural irrigation rates
Kingston	MA	1997 - 2000	Groundwater flow model developed to estimate groundwater impacts from treated effluent infiltration, including mounding of the water table, increased baseflows to streams, and nutrient discharges to sensitive receptors. Model simulations also focused on potential impacts on nearby town landfill, commercial cranberry bog operation, vernal pools and wetlands, and town water supply wells with wellhead protection areas.
Artesian Water Co.	DE	1996 - 2000	Artesian Water Co. ASR Piloting - Groundwater flow model developed to simulate the spreading and recovery of injected water for a pilot Aquifer Storage-Recovery well designed by CDM. CDM tracked the capture of injected water by nearby pumping wells.
Lipari Landfill	NJ	1996 - 1999	The following analyses were performed: Seepage face modeling for design of control system; Local Model simulations for design of trench drain system in Kirkwood aquifer; Detailed plume simulations and "box model" development for assistance with PRP negotiations.
Kai Tak Airport	Hong Kong	1996 - 1998	Groundwater flow and contaminant transport models for assessment for petroleum and solvent plumes at the airport.
Massachusetts Military Reservation	MA	1996 - 1997	Groundwater flow model developed to evaluate hydraulic containment achieved by existing groundwater remediation system, and to make recommendations for remediation system modifications. Modeling analysis included conversion of USGS MODFLOW model to DYNSTEM.
Industrial Client	NY	1995 - 2003	Site model used to evaluate remediation well capture zones, identify new monitoring well locations, assist in the design of nutrient injection pilot tests.

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Sparks-Reno	NV	1995 - 2001	Model of groundwater flow and VOC migration. Analysis of impacts of restoring mining pit to recreational lake. Model also used to guide design and placement of new extraction wells and to evaluate hydraulic capture zones for different remediation pumping scenarios.
San Gabriel Basin	CA	1995 -1996	Basin-wide groundwater flow model developed to evaluate impact of applied recharge program to basin groundwater flow field. Preliminary extraction and recharge scenarios simulated to investigate potential remedial system. Project involves large scale pumping.
Puente Valley	CA	1995 - 1996	Flow and contaminant transport model developed to characterize the basin flow field and to assess various remedial extraction systems for the feasibility study of a Superfund site. Multi PRP site.
San Bernardino Basin	CA	1995 - 1996	Basin wide groundwater flow model. Evaluate potential water quality impacts of alternative basin pumping and recharge management strategies. Interaction with regional USGS model.
Chemsol	NJ	1995 - 1996	FS model of fractured shale aquifer. Development of pump and treat system design.
Zellwood	FL	1995	DYNFLOW model used to evaluate effectiveness of various groundwater extraction schemes, to both contain contaminated groundwater and begin contaminant mass removal.
Vulcan Chemical	KN	1995	Flow and transport models for assessment of existing site, and development of containment measures.
Benfield Industries	NC	1995	DYNFLOW model used to develop groundwater extraction system to contain and extract groundwater contaminated with organic and inorganic chemicals, for a remedial design.
Waldick Aerospace	NJ	1995	Flow and transport model developed for Superfund site. A complex, stream impacted flow field was simulated. The migration of VOCs and metals from the site into nearby stream and wetlands was simulated. Model applied to both plume delineation and remediation.
Brookhaven National Laboratory	NY	1995	Flow and transport models developed for use in RI/FS study. Migration of VOCs and radio-nuclides simulated.
Long Island Water Corporation	NY	1995	Flow and saltwater intrusion (DYNSWIM) model developed to assess potential for saltwater intrusion at a large, shallow well field. Model investigated three different potential sources of saltwater.

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Long Island Water Corporation	NY	1995	Radial grid model used to simulate saltwater upconing using DYNWIM to assess the possibility of saltwater upconing into a major, suction well field.
San Fernando Basin	CA	1994 - 1996	Flow and contaminant transport models developed to determine location and flow rates for remedial extraction system at a Superfund site. Contaminant transport model used to estimate influent concentrations to treatment plant.
HASEKO (Ewa)	HI	1994 - 1996	Flow and sea water intrusion model developed to characterize the Ewa Caprock Aquifer on Oahu, and to assess the potential effects of development of a new marina.
Fireman's Training Center	NY	1994 - 1995	Groundwater flow and contaminant transport model developed to assist in design of a groundwater treatment system at a hazardous waste site. Model used to determine location and flow rates of remedial extraction wells, and to assess impact of contaminant transport.
Industrial Client	NY	1994	DYNBIO model used to simulate transport and biodegradation of benzene groundwater plume.
Dominguez Gap	CA	1993 - 1998	Investigation of existing saline plume inland of the Dominguez Gap injection barrier; evaluation of measures to improve barrier performance and control remnant plume.
Industrial Site	NE	1993 - 1998	Litigation support; modeling used for preliminary assessment of source(s) of TCE/TCA plume.
Fresno Sanitary Landfill	CA	1993 - 1994	Evaluation of landfill plume, contaminant fate, risk assessment support, and evaluation of remedial alternatives.
Williams AFB	AZ	1993	DYNFLOW used to model hydraulics and plume capture zone for 500 ft. horizontal well.
Falmouth	MA	1993	Confirmation of prior predictive simulations, and simulation of expanded infiltration basins for treated wastewater.
Rocky Hill	NJ	1992 - 2003	Steady-state and transient groundwater flow modeling of fractured shale aquifer to support design of extraction-injection remediation system. DYNTRACK used to assess capture zones for proposed wells.
Plymouth	MA	1992 - 1999	Simulation of impacts of wastewater infiltration basins prediction of water table mounding, and increased nutrient loads to surface streams. Coupled to QUAL2E surface water quality model. MODFLOW to DYNFLOW conversion of USGS model.

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Gilbert-Mosley	KS	1992 - 1998	Evaluation of migration and fate of contaminants in the groundwater including biodegradation and partitioning, remedial alternative analyses, estimates of clean-up times.
Industrial Client	NY	1992 - 1998	Site closure, remediation design and permitting of new landfill.
Los Angeles Int'l Airport	CA	1992 - 1997	DYN used to display contaminated groundwater data at monitoring sites throughout airport. Extensive use of 'fingerprint' plots.
S.E. Rockford	IL	1992 - 1995	Large multi-source RI/FS study. Data management/display; regional/local flow and contamination transport models; multi-PRP identification.
Industrial Site	CA	1992 - 1994	Modeling of nitrate plume from former fertilizer manufacturing facility.
Industrial Site	CA	1992 - 1993	Detailed flow and transport models for BTEX, TCE and Chromium at a solvent manufacturing and waste reclamation facility. Models used for risk assessment, and negotiating long-term control/remediation options.
Industrial Client	NY	1992 - 1993	Application of DYNVAP model to simulate sub-surface migration of Benzene vapors.
San Gabriel Basin	CA	1992	Model of Flow and Contaminant Migration in the overall basin. DYNFLOW and DYNTRACK used to assess large scale TCE plumes.
Industrial Site	FL	1992	Application of existing Dade County DYNFLOW model to evaluate zone of capture for increased pumping from water supply well fields.
Litigation Client	MT	1992	DYNNAPL simulation of floating creosote plume in support of litigation.
Bypass 601	NC	1992	Feasibility Study/Risk Assessment for remediation of heavy metal and VOC contaminated groundwater.
Waldick Aerospace Site	NJ	1992	Groundwater flow and contaminant (PCE) transport modeling at EPA Superfund site.
West Coast Basin	CA	1991 - 1992	Extension of above study to include model of entire West Coast Basin; used to assess water supply and contaminant control options.
Orange Co.	FL	1991 - 1992	Landfill permitting, litigation support, and evaluation of wetland impacts.
American Cyanamid	NJ	1991 - 1992	Update groundwater model to assess yield and plume containment from proposed new production wells.
Industrial Client	NY	1991 - 1992	Additional detailed models using DYNAPL & DYNTRACK for Risk analysis and remediation design.
Industrial Site	CA	1991	Source identification studies; data management & display; litigation support.

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Koornward	Dominican Republic	1991	Regional/local flow and contaminant transport models for landfill assessment.
Gas Station Site	CA	1990 - 1992	Litigation support at site with gasoline & diesel plumes; extensive use of DYNAPL for free product simulations, assessment of possible site history and release determination; litigation support and expert testimony at trial.
Industrial Site	CA	1990 - 1992	Local flow and contaminant models. TCE and Nitrate movement modeled. Development of remedial schemes and preparation for potential litigation.
Industrial Site	FL	1990 - 1992	Litigation support at a wood treatment facility; PCP & Mineral Spirits were principal contaminants; modeling used for litigation support.
Industrial Site	CA	1990 - 1991	TCE plume; study to determine control and remediation measure.
Marshfield	MA	1990	Determination of Zones of Contribution to well field for landfill permitting.
Newmont Gold	NV	1990	Evaluation of beneficial reuse from mine dewatering operation.
Industrial Client	NY	1989 - 1992	Large gasoline spill and solvent contamination. Free Product gasoline modeled using DYNAPL; dissolved plumes modeled using DYNTRACK.
VanWater & Rogers	CA	1989	Industrial site with leaking tanks; evaluation of source timing, location and strength and prediction of plume movement; comparison of prediction with other techniques.
62nd St. Landfill	FL	1989	Feasibility study for remediation of heavy metal leachate.
Venice	FL	1989	Consumptive use report, simulated impact of pumping.
Vroom	FL	1989	Remedial design, solvent contamination.
Mountain View	CA	1987 - 1990	Flow and transport model of widespread TCE contamination in Silicon Valley basin; model used in EPA oversight action.
West Coast Basin	CA	1987 - 1989	Large scale model of 120 well injection barrier for seawater intrusion control; evaluation of present barrier performance, assessment of modifications, control option for isolated inland brackish plume.
San Juan Basin	CA	1987 - 1988	Basin wide water quality management plan.
Sand Creek	CO	1987 - 1988	Hazardous waste plume control project.
Fort Dix	NJ	1987 - 1988	US Army Corps of Engineers - Hazardous waste site - landfill RI/FS, evaluation of risk due to contaminant migration, assessment and preliminary design of remedial alternatives (capping, pump & treat).
Redlands	CA	1987	Percolation Ponds siting study.
Lee Co.	FL	1987	Aquifer management plan, well field protection.

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Ciba Geigy	NJ	1987	Industrial Site: enforcement support and design of groundwater extraction and re-injection system.
Katonah	NY	1987	Superfund Site - evaluation of PRP contributions to municipal well contamination. Estimate of aquifer clean-up times.
AT&T	MA	1986 - 1996	Industrial site; simulation of solvent contamination in groundwater from various sources including leaking tanks. Remediation system design and installation. On-going cleanup monitoring.
Rocky Mountain Arsenal	CO	1986 - 1991	Superfund Site - Large-scale model of flow & contaminant plumes at site.
Santa Ana Watershed Authority	CA	1986 - 1989	Effluent recharge from secondary treatment plant.
Woodlands Sites	NJ	1986 - 1988	3D modeling and lumped parameter analysis used to evaluate clean-up alternatives at two hazardous waste disposal sites.
Dade Co.	FL	1986 - 1987	Well Field Development - Countywide model developed and installed at county offices.
IMC	NH	1986 - 1987	Models used to predict rates of cleanup with and without active remediation; expert testimony at trial.
Redlands	CA	1986	TCE plume remediation study.
Hillsborough Co.	FL	1986	Dewatering, landfill design, infiltration basins.
Hipps Road Landfill	FL	1986	REM II site - landfill plume assessment.
Orange Co.	FL	1986	N.W. Orange Co.; assessment of Rapid Infiltration Basin System; local flow models.
Orange Co.	FL	1986	Local/regional models of groundwater system with sinkholes.
Seminole Co.	FL	1986	Countywide model for water supply Master Plan.
W.R.Grace	MA	1986	Evaluation of additional wells adjacent to existing municipal wells.
Cape May	NJ	1986	Assessment of leachate migration from existing landfill; simulation of possible plumes from new landfill.
Cumberland Co.	NJ	1986	Landfill siting study; local flow and transport models.
D'Imperio	NJ	1986	Superfund Site - landfill leachate plume.
Gloucester Co.	NJ	1986	Landfill siting study; local flow and transport models.
Pomona Oaks	NJ	1986	Emergency well field relocation, long term cleanup of hazardous waste plume.
South Valley	NM	1986	Superfund hazardous waste site.
Twin Cities Arsenal	MN	1985 - 1989	Regional scale model of plumes at site, source assessment, review of proposed control/remediation options.
LiPari Landfill	NJ	1985 - 1988	Landfill leachate control/ remediation. Used lumped parameter model.
Delilah Road	NJ	1985 - 1987	Hazardous waste landfill site; plume modeling and remedial scheme assessment.

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W.R.Grace	MA	1985 - 1986	Revised prediction of cleanup times based on actual remediation pumping rates.
Cucamonga Basin	CA	1985	Basin plan development.
White Cliffs Development	MA	1985	Leachate field siting - simplified potential flow model applied.
Industrial Client	NM	1985	Hazardous waste site; plume remediation.
American Cyanamid	NJ	1984 - 1988	Models of contaminant flow in fractured rock system.
Provincetown	MA	1984 - 1986	Gasoline Spill, Local/regional models.
IMC	NH	1983 - 1985	Litigation Support. Used DYNFLOW and DYNTRACK to identify contaminant sources, and quantify sources over time for litigation. Expert testimony at trial including courtroom presentation of models and DYNPLOT graphics.
Northern States Power	MN	1983 - 1984	Simulation of migration of waste plume from scrubbers at large thermal power plant.
Lone Pine	NJ	1982 - 1988	Superfund site - simulation of migration of landfill leachate, and slurry wall control option.
Falmouth	MA	1982 - 1987	3 studies on sewage disposal, landfill plume migration, and development of water supply master plan.
W.R.Grace	MA	1981 - 1992	Hazardous waste site, development of remediation scheme, negotiations with regulatory agencies, implementation and monitoring of remediation scheme.
Weston	MA	1981 - 1986	3 models of flow from a large scale leaching field; plume migration assessed.
Prices Pit #1	NJ	1981 - 1986	Hazardous waste site, enforcement action; evaluation of solvent plume migration and assessment of remedial options. Litigation support.
W.R.Grace	MA	1981 - 1982	Evaluation of VDC (1-1 Dichloroethylene) plume and impacts on municipal wells using DYNFLOW and DYNTRACK. Identification of all contaminant sources on site. Development of focused well field protection strategies. Implementation of remediation scheme.
Atomic Energy Commission Ltd.	Manitoba	1980	High-level radioactive waste test repository - siting study. Flow model of fractured rock aquifer.
Delaware River Basin Commission	NJ	1979 - 1981	Delaware River Basin Regional Study; large scale modeling of the lower Delaware Basin, including the entire coastal plain aquifers. Seawater intrusion assessed; as well as impacts of large scale pumping operations (AQUIFEM-N).
Falkirk Mine	ND	1978 - 1979	Open pit coal mine - suffering from periodic flooding from groundwater; dewatering control design (AQUIFEM-N).

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