Ian James. Duncan

Professional Summary

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Professional Preparation

Academic Background

Ph.D. Geology, University of British Columbia, Vancouver, Canada, 1982

B.A., Honors I, Earth Sciences, Macquarie University, Sydney, Australia, 1974

Professional Appointments

Present Position: Associate Director and Research Scientist, Bureau of Economic Geology, The University of Texas at Austin (July 2004 - Present). Acting manager of BEG's Gulf Coast Carbon Center, agency expert on clean coal technologies and integrating carbon capture into enhanced oil recovery (EOR) projects.

Principal investigator for multiple water resources, environmental geology, and natural resource investigations.

Geologist Consultant (Scientist Manager II), Virginia Department of mines, Minerals, and Energy (2001 - June 2004). Management and writing of grants and contracts (including in 2003, writing grant applications for DMME and DMR); team leader for DMR State Map funded project focusing on stratigraphic, structural, and Quaternary surficial geological mapping in the Valley and Ridge; team leader of DMME Information Technology Task Force (including oversight of DMME's Electronic Permitting Initiative, GIS data development for abandoned coal mine maps, long range IT planning).

Geologist Supervisor (Grade 13) Eastern Geology and Spatial Data Section Manager, Virginia Department of Mines, Minerals, and Energy (1996 - 2001). Responsible for Divisions GIS data development; direct supervisor for 7 staff, 4 working on GIS and Remote Sensing projects; developing metadata and spatial information strategy for Department; Leader DMME Information Technology Task Force, responsible for restructuring Department IT strategy from mainframe to a distributed network (writing DMME IT Plans, writing RFP's for DMME's "Work Flow for Electronic Permitting" ($230,000) and "Regulatory Data Base Conversion for Division of Gas and Oil" ($350,000) procurements).

Geologist Supervisor, Virginia Department of Mines, Minerals, and Energy, Division of Mineral Resources (1996 - 2001). Direct supervision of five staff members, two working on GIS projects and two working on OSM funded digital compilation of abandoned coal mine maps in SW Virginia and one working on karst mapping/ Quaternary Geology and environmental /engineering geology.

Associate Professor of Earth and Planetary Sciences; faculty associate in the McDonald Center for Earth and Planetary Remote Sensing, Washington University (1986 - 1993). Remote sensing (Landsat TM-based mapping of the Najd shear zone in Saudi Arabia; remote sensing study of faults in Madagascar, remote sensing interpretation of laboratory measurement of spectral signatures of fresh and weathered rock surfaces, geologic interpretation of synthetic aperture

radar imagery from Space Shuttle SIR-B and SIR-C data from Sudan, statistical analysis and inversion of remote sensing image data); geodynamics; structural geology; and finite element modeling.

Assistant Professor, Southern Methodist University (1979 - 1986). Structural geology, and geochronology; field work in New Mexico, Colorado, Canada and Oklahoma; funded and set up a Fission Track dating Laboratory; fission track dating to constrain uplift along Rio Grande Rift; experimental studies of fission track blocking temperatures; compaction and diagenesis of Sligo Formation Texas Gulf Coast; Sr and stable isotope study of Sligo Formation (in collaboration with ARCO Research Labs); study of relationship between porosity evolution and compaction in grainstones; study of compaction in the Smackover Formation using strain analysis techniques. Supervised 3 PhD dissertations and 4 MSc Theses.

Teaching Assistant; Instructor in Charge of Field Camp section, summers of 1973-77, University of British Columbia (1973 - 1979). Geologic mapping in Monashee Range of the Rocky Mtns; Rb/Sr and Pb/Pb Geochronology; structural geology of Big Ledge Lead-Zinc Prospect; experimental phase equilibrium studies.

Theses

Petrological evolution of the Ok Tedi Skarn deposit, Papua New Guinea

Dissertations

Structural evolution of the Thor Odin Gneiss Dome

Areas of Expertise

Areas of Expertise

Carbon management based on geologic CO2 sequestration, development and management of large-scale pilot projects for carbon capture and long-term storage, and implementation of clean oil technologies

Conceiving, designing, implementing, and managing multidisciplinary geologic information management projects

Managing integrated grant/contract-based multidisciplinary research projects in a nonprofit organization

Modern geologic mapping, remote sensing, structural geology, knowledge management in the earth sciences, digital mapping/ enterprise GIS, and geochronology

Awards

Awards and Honorary Societies

Canadian Pacific Graduate Travel Fellowship

Commonwealth of Australia University Scholarship

DMME Outstanding Contribution Award

GSA Penrose Grant Outstanding Proposal

James Coates Graduate Scholarship

Killam Predoctoral Fellowship

UBC Geological Sciences Outstanding Teaching Assistant Award

University of British Columbia Graduate Fellowship

Service

External Committees Participation

Leader, Performance Measures Task Force, DMME, 0

Leader, Information Technology Task Force, DMME, 0

Leader, State Map Mapping Team, DMR, 0

Member, Virginia State Agency Technical Remote Sensing Data Needs Advisory Committee, George Mason University and Virginia Economic Development Partnership, 2001 - 2004

Member, Digital Geologic Mapping Committee, Data Information Exchange and Data Capture Work Groups, AASG, 1996 - 2004

Member, Technical Advisory Committee, Virginia GIS Network State Agency, 1996 - 2004

Member, Virginia Gap Analysis (Remote Sensing) Advisory Committee, Virginia Tech, 1996 - 2004

Technical Advisor, Virginia GIS Coordinator, Statewide purchase of SPOT imagery, 1996 - 2001

Teaching and Advising

Continuing Education Courses Taught

Digital Mapping Techniques: presented at Martha Washington College, Abingdon, Virginia,

Four 1-day short courses on Introduction to Geographic Information Systems: presented to Virginia Department of Transportation, Richmond, Virginia,

Thermodynamics and Phase Equilibrium: presented at Australian National University, Canberra, Australia,

Thermodynamics and Phase Equilibrium: presented at The University of Texas at Dallas, Dallas, Texas,

Using comprehensive planning to preserve industrial mineral and aggregate reserve: DMR Short Course for Regional Planners,

Presentations

Presentations

Analysis of Vertical Permeability and Its Influence on CO2 EOR and Storage In A Carbonate Reservoir: presented to Society of Petroleum Engineers, presented at 2021 SPE Annual Technical Conference and Exhibition (ATCE), Dubai, United Arab Emirates, September 21-23, 2021.

Evaluating risks of CO2 transportation: potential impacts of CO2 on human health: poster presented at 11th Annual Carbon Capture, Utilization, and Sequestration Conference, Pittsburgh, Pennsylvania, May 2, 2012.

The nature of methane leakage from natural gas wells as an analogue for shallow CO2 migration: does bubble transport and slug flow in fractures dominate?: presented at 11th Annual Carbon Capture, Utilization, and Sequestration Conference, Pittsburgh, Pennsylvania, May 1, 2012.

Introduction to the carbon landscape: research, funding, staffing, sustaining across cycles: presented at Bureau of Economic Geology Visiting Committee meeting, Austin, Texas, August 2, 2010.

Risks and benefits of geologic sequestration of carbon dioxide--how do the pieces fit together?: presented at Pacific Sections AAPG-SEPM-SEG Convention, 100th Anniversary of The Texas Bureau of Economic Geology Session, Ventura, California, May 5, 2009.

Risk assessment for future CO2 sequestration projects based CO2 enhanced oil recovery in the U.S: presented at the GHGT-9 (Green House Gas Technology) Conference, Washington, D.C.,

November 16-20, 2008.

Addressing public policy issues facing long term CO2 storage in Texas: presented at Fifth Annual Conference on Carbon Capture & Sequestration, Alexandria, Virginia, May 8-11, 2006.

Numerical modeling of role of faults in understanding long-term CO2 storage: the upscaling dilemma: presented at Fifth Annual Conference on Carbon Capture & Sequestration, Alexandria, Virginia, May 8-11, 2006.

Texas FutureGen: a win for the region: invited opening address presented at CO2 Workshop, Midland, Texas, December 6, 2005.

The Gulf Coast Carbon Center: enabling development of a carbon sequestration industry in the Gulf Coast: presented to the Houston Geological Society, Houston, Texas, November 15, 2005.

Reliability in geoinformatics: theory and practical applications in digital geologic map compilation: presented at Geological Society of America Annual Meeting, Salt Lake City, Utah, October 16, 2005.

Getting more oil recovery and reducing global warming at the same time: a cross border win-win?: invited lecture presented at Cross Border Energy Forum, Santa Fe, New Mexico, October 13, 2005.

The Gulf Coast Carbon Center: exploring synergies between gasification and CO2 sequestration: invited lecture presented at Gasification 2005, San Francisco, California, October 11, 2005.

The Gulf Coast Carbon Center: CO2 sequestration research objectives: presented to Virginia Geologic Survey, Charlottesville, Virginia, September 22, 2005.

CO2 EOR: new economic drivers and new strategies: luncheon speech presented at AAPG Eastern Section Annual Meeting, Morgantown, Virginia, September 19, 2005.

Elevation data sets for GIS in Virginia: presented at Virginia GIS Meeting, Roanoke, Virginia, 2000.

Absolute and relative accuracy in GIS datasets: presented at Virginia GIS Conference, 1999.

Geology and Reservoir Properties of the Residual Oil Zone (ROZ) of the San Andres Seminole Unit, West Texas: presented to AAPG, presented at SWS AAPG Conference, Houston, June 23, 2021-Present.

A remote sensing approach to estimating runoff from impervious surfaces: presented at Virginia Tech University, Blacksburg, Virginia,

Biodiversity in Virginia: the role of geology: presented to Ivy Creek Natural Foundation, Charlottesville, Virginia,

Creating geological databases for engineering and Quaternary Geology: presented to Virginia Department of Transportation Engineering Geology Group, Richmond, Virginia,

Digital databases, digital geologic maps, and highway planning: presented to Virginia Transportation Research Council, Charlottesville, Virginia,

Digital geologic mapping using GIS: presented to Virginia Tech Department of Geological Sciences Colloquium, Blacksburg, Virginia,

Educating regional planners on aggregate resources: presented at National Transportation Research Council Annual Meeting, Washington, D.C.,

Environmental/Quaternary geology and karst mapping: implications for highway planning: presented at Virginia Department of Transportation Environmental Review Bi-Annual Meeting, Richmond, Virginia,

Geologic history of Virginia: presented to Ivy Creek Natural Foundation, Charlottesville, Virginia,

GIS for mapping abandoned coal mines in Virginia: presented to National Research Council Committee on Impoundment Failures, Huntington, West Virginia,

Liability of government agencies for GIS data: presented at Digital Mapping Techniques Symposium, Pennsylvania

New approaches to creating digital geologic maps: presented to U.S. Geological Survey, geology division, Reston, Virginia,

The evolution of the early Earth: presented at the Piedmont Virginia College Annual Endowed Colloquium in the Sciences, Charlottesville, Virginia,

Activities of a Professional Nature

Professional Societies

Geological Society of America (Structural Geology Division, Coal Division, Hydrogeology Division)

Publications

Peer Reviewed Journal Articles

Cherif, A., Atwair, M., Atsbha, T. A., Zarei, M., Duncan, I. J., Nebbali, R., Sen, F., and Lee, C.-J., 2023, Enabling low-carbon membrane steam methane reforming: comparative analysis and multi-objective NSGA-II-integrated Bayesian optimization: Energy Conversion and Management, v. 297, no. 117718, 12 p., http://doi.org/10.1016/j.enconman.2023.117718.

Ren, B., Jensen, J., Duncan, I., and Lake, L., 2023, Buoyant flow of H2 vs CO2 in storage aquifers: implications to geological screening: Society of Petroleum Engineers Reservoir Evaluation and Engineering, v. 26, no. 3, p. 1048-1058, http://doi.org/10.2118/210327-PA.

Ren, B., Jensen, J. L., Lake, L. W., Duncan, I. J., and Male, F., 2022, Analysis of vertical permeability and its influence on CO2 enhanced oil recovery and storage in a carbonate reservoir: Society of Petroleum Engineers Reservoir Evaluation & Engineering, v. 25, no. 3, p. 414-432, http://doi.org/10.2118/205995-PA.

Abdelaal, M., Zeidouni, M., and Duncan, I. J., 2021, Effects of injection well operation conditions on CO2 storage capacity in deep saline aquifers: Greenhouse Gases: Science and Technology, v. 11, no. 4, p. 734-749, http://doi.org/10.1002/ghg.2076.

Chen, H., Zhang, C., Jia, N., Duncan, I., Yang, S., and Yang, Y. Z., 2021, A machine learning model for predicting the minimum miscibility pressure of CO2 and crude oil system based on a support vector machine algorithm approach: Fuel, v. 290, no. 120048, 13 p., http://doi.org/10.1016/j.fuel.2020.120048.

Ren, B., and Duncan, I. J., 2021, Maximizing oil production from water alternating gas (CO2) injection into residual oil zones: the impact of oil saturation and heterogeneity: Energy, v. 222, no. 119915, 13 p., http://doi.org/10.1016/j.energy.2021.119915.

Chen, H., Li, B., Duncan, I., Elkhider, M., and Liu, X., 2020, Empirical correlations for prediction of minimum miscible pressure and near-miscible pressure interval for oil and CO2 systems: Fuel, v. 278, no. 118272, 13 p., http://doi.org/10.1016/j.fuel.2020.118272.

Chen, H., Liu, X., Jia, N., Tian, X., Duncan, I., Yang, R., and Yang, S., 2020, The impact of the oil character and quartz sands on the thermal behavior and kinetics of crude oil: Energy, v. 210, no. 118573, 10 p., http://doi.org/10.1016/j.energy.2020.118573.

Male, F., and Duncan, I. J., 2020, Lessons for machine learning from the analysis of porosity-permeability transforms for carbonate reservoirs: Journal of Petroleum Science and Engineering, v. 187, no. 106825, 11 p., http://doi.org/10.1016/j.petrol.2019.106825.

Ren, B., and Duncan, I. J., 2019, Reservoir simulation of carbon storage associated with CO2 EOR in residual oil zones, San Andres formation of West Texas, Permian Basin, USA: Energy,

v. 167, p. 391-401, http://doi.org/10.1016/j.energy.2018.11.007.

Ren, B., and Duncan, I., 2019, Modeling oil saturation evolution in residual oil zones: implications for CO2 EOR and sequestration: Journal of Petroleum Science and Engineering, v. 177, p. 528-539, http://doi.org/10.1016/j.petrol.2019.02.072.

Meng, M., Fan, T., Duncan, I. J., Yin, S., Gao, Z., Jiang, L., Yu, C., and Jiang, L. Y., 2018, Characterization of carbonate microfacies and reservoir pore types based on Formation MicroImager logging: a case study from the Ordovician in
the Tahe Oilfield, Tarim Basin, China: Interpretation, v. 6, no. 1, p. T71-T82, http://doi.org/10.1190/INT-2017-0043.1.

Mao, Y., Zeidouni, M., and Duncan, I. J., 2017, Temperature analysis for early detection and rate estimation of CO2 wellbore leakage: International Journal of Greenhouse Gas Control, v. 67, p. 20-30, http://doi.org/10.1016/j.ijggc.2017.09.021.

Zhang, X., Sun, A. Y., Duncan, I. J., and Vesselinov, V. V., 2017, Two-stage fracturing wastewater management in shale gas development: Industrial & Engineering Chemistry Research, v. 56, no. 6, p. 1570-1579, http://doi.org/10.1021/acs.iecr.6b03971.

Jiang, L., Cai, C., Worden, R. H., Crowley, S. F., Jia, L., Zhang, K., and Duncan, I. J., 2016, Multiphase dolomitization of deeply buried Cambrian petroleum reservoirs, Tarim Basin, north-west China: Sedimentology, v. 63, p. 2130-2157, http://doi.org/10.1111/sed.12300.

Zhang, X., Sun, A. Y., and Duncan, I. J., 2016, Shale gas wastewater management under uncertainty: Journal of Environmental Management, v. 165, no. 1, p. 188-198, http://doi.org/10.1016/j.jenvman.2015.09.038.

Duncan, I. J., 2015, Does methane pose significant health and public safety hazards?--a review: Environmental Geosciences, v. 22, no. 3, p. 85-96, http://doi.org/10.1306/eg.06191515005.

Duncan, I. J., and Wang, H., 2014, Estimating the likelihood of pipeline failure in CO2 transmission pipelines: new insights on risks of carbon capture and storage: International Journal of Greenhouse Gas Control, v. 21, p. 49-60., http://doi.org/10.1016/j.ijggc.2013.11.005.

Duncan, I. J., and Wang, H., 2014, Evaluating the likelihood of pipeline failures for future offshore CO2 sequestration projects: International Journal of Greenhouse Gas Control, v. 24, p. 124-138, http://doi.org/10.1016/j.ijggc.2014.02.004.

Wang, H., and Duncan, I. J., 2014, Likelihood, causes, and consequences of focused leakage and rupture of U.S. natural gas transmission pipelines: Journal of Loss Prevention in the Process Industries, v. 30, p. 177-187, http://doi.org/10.1016/j.jlp.2014.05.009.

Wang, H., and Duncan, I. J., 2014, Understanding the nature of risks associated with onshore natural gas gathering pipelines: Journal of Loss Prevention in the Process Industries, v. 29, p. 49-55, http://doi.org/10.1016/j.jlp.2014.01.007.

Zhang, X., Duncan, I. J., Huang, G., and Li, G. C., 2014, Identification of management strategies for CO2 capture and sequestration under uncertainty through inexact modeling: Applied Energy, v. 113, p. 310-317.

Scanlon, B. R., Duncan, I. J., and Reedy, Robert, 2013, Drought and the water-energy nexus in Texas: Environmental Research Letters, v. 8, no. 4, doi:10.1088/1748-9326/8/4/045033.

Scanlon, B. R., Reedy, R. C., Duncan, I. J., Mullican, W. F., III, and Young, M. H., 2013, Controls on water use for thermoelectric generation: Case study Texas, U.S.: Environmental Science & Technology, v. 47, no. 19, p. 11326-11334, http://doi.org/10.1021/es4029183.

Adelman, D. E., and Duncan, I. J., 2012, The limits of liability in promoting safe geologic sequestration of CO2: Duke Environmental Law & Policy Forum, v. 22, no. 1, p. 1-66.

Nicot, J. -P., and Duncan, I. J., 2012, Common attributes of hydraulically fractured oil and gas production and CO2 geological sequestration: Greenhouse Gases Science and Technology, v.

2, p. 352-368.

Ambrose, W. A., Breton, C., Hovorka, S. D., Duncan, I. J., Gülen, G., Holtz, M. H., and Nuñez-López, V., 2011, Geologic and infrastructure factors for delineating areas for clean coal: examples in Texas, USA: Environmental Earth Science, v. 63, p. 513?-532.

Stillwell, A. S., King, Carey, Webber, M. E., Duncan, I. J., and Hardberger, A., 2011, The energy-water nexus in Texas: Ecology and Society, v. 16, no. 1, 20 p.

King, Carey, Webber, M. E., and Duncan, I. J., 2010, The water needs for LDV transportation in the United States: Energy Policy, v. 38, p. 1157-1167.

Ambrose, W. A., Breton, Caroline, Holtz, M. H., Nuñez-López, Vanessa, Hovorka, S. D., and Duncan, I. J., 2009, CO2 source-sink matching in the lower 48 United States, with examples from the Texas Gulf Coast and Permian Basin: Environmental Geology: Environmental Geology, v. 57, p. 1537-1551.

Ambrose, W. A., Lakshminarasimhan, Srivatsan, Nuñez-López, Vanessa, Hovorka, S. D., and Duncan, I. J., 2008, Geologic factors controlling CO2 storage capacity and permanence: case studies based on experience with heterogeneity in oil and gas reservoirs applied to CO2 storage: Environmental Geology, v. 54, p. 1619-1633.

Nicot, J. -P., and Duncan, I. J., 2008, Science-based permitting of geological sequestration of CO2 in brine reservoirs in the U.S.: Environmental Science & Policy, v. 11, p. 14-24.

Duncan, I. J., Rivard, B., and Arvidson, R., 1992, Varnish, soil and rock controls on spectral reflectance of outcrops in the Meatiq Dome area, Egypt: Geology, v. 20, no. 4, p. 295-298.

Duncan, I. J., Rivard, B., Sultan, M., and Arvidson, R., 1990, Structural interpretation and tectonic evolution of part of the Najd shear zone utilizing Landsat Thematic Mapper data: Tectonophysics, v. 178, p. 309-335.

Duncan, I. J., Sultan, M., and Arvidson, R., 1990, Extension of the Najd shear zone to Central Eastern Egypt: Reply: Tectonics, v. 9, p. 539-543.

Duncan, I. J., and Sweetkind, D., 1989, Fission track evidence for Eocene uplift of the Nelson Batholith, Southeastern British Columbia: Canadian Journal of Earth Sciences, v. 16, p. 1944-1952.

Duncan, I. J., Sultan, M., and Arvidson, R., 1988, Extension of the Najd shear system from Saudi Arabia to the Central Eastern Desert of Egypt based on integrated field and Landsat observations: Tectonics, v. 7, no. 6, p. 1291-1306.

Duncan, I. J., 1987, Ability of the Fry Method to characterize pressure solution deformation--discussion: Tectonophysics, v. 138, p. 325-326.

Duncan, I. J., and Kelley, S. A., 1986, Late Cretaceous to middle Tertiary tectonic history of the northern Rio Grande Rift, New Mexico: Journal of Geophysical Research, v. 91, p. 6246-6262.

Duncan, I. J., and Shore, P. J., 1985, Finite strains from non-coaxial strain paths: I. Computational techniques: Tectonophysics, v. 110, p. 127-144.

Duncan, I. J., and Shore, P. J., 1985, Matrix computation of deformed lineation patterns: Tectonophysics (letters section), v. 109, p. 337-344.

Duncan, I. J., Harrison, T. M., and McDougall, I., 1985, Diffusion of 40Ar in biotite: temperature, pressure, and compositional effects: Geochimica et Cosmochimica Acta, v. 49, p. 2461-2468.

Duncan, I. J., 1984, Lead isotope systematics and the evolution of the core, mantle, crust and atmosphere: Journal of Geodynamics, v. 2, p. 1-21.

Duncan, I. J., 1984, Structural evolution of the Thor-Odin gneiss dome: Tectonophysics, v. 101, p. 87-130.

Non Peer Reviewed Journal Articles

Shuster, M., Bhattacharya, S., Duncan, I. J., Eichhubl, P., Hosseini, S. A., Javadpour, F., Kipper, J. P., Lin, N., Nicot, J.-P., and Ren, B., 2021, Hydrogen infrastructure expansion requires realistic framework: Oil & Gas Journal.

Duncan, I. J., Anderson, S., and Nicot, J. -P., 2009, Pore space ownership issues for CO2 sequestration in the U.S., in Energy Procedia (v. 1, no.1), Proceedings of 9th International Conference on Greenhouse Gas Control Technologies GHGT9, November 16-20, Washington D.C., p. 4427-4431.

Duncan, I. J., Nicot, J. -P., and Choi, J. -W., 2009, Risk assessment for future CO2 sequestration projects based on CO2 enhanced oil recovery in the U.S., in Energy Procedia (v. 1, no.1), Proceedings of 9th International Conference on Greenhouse Gas Control Technologies GHGT9, November 16-20, Washington D.C., p. 2037-2042.

King, C., Webber, M., and Duncan, I., 2008, Water intensity of transportation fuels: water projections for fuel adoption rates of light duty vehicles, in Proceedings, ASME 2nd International Conference on Energy Sustainability, Jacksonville, Florida, August 10-14.

Ambrose, W. A., Holtz, M. H., Nuñez-Lopez, Vanessa, Breton, C. L., Gülen, Gürcan, Duncan, Ian, Smyth, R. C., Foss, M. M., Lakshminarasimhan, Srivatsan, and Hovorka, S. D., 2006, FutureGen: clean-coal and near-zero-emission power generation technology for the Gulf Coast: Gulf Coast Association of Geological Societies Transactions, v. 56, p. 5-13.

Duncan, I. J., Ambrose, W. A., Holtz, M. H., Hovorka, S. D., Esandoh-Yeddu, Joseph, Nuñez López, Vanessa, Nicot, J. -P., Smyth, R. C., and Lakshminarasimhan, Srivatsan, 2006, The Gulf Coast Carbon Center: developing a carbon sequestration industry in the Gulf Coast region, in 8th International Conference on Greenhouse Gas Control Technologies, Trondheim, Norway, June 19-22, CD-ROM [4 p.].

Campbell, Elizabeth, Duncan, I. J., and Hibbitts, Harry, 2005, Analysis of errors occurring in the transfer of geologic point data from field maps to digital data sets, in Soller, D., Digital mapping techniques 2005: U.S. Geological Survey Open File, p. 61-65.

Duncan, I. J., 2005, Authenticity and long term preservation of digital geologic products in archival geoinformatics, in Proceedings, IAMG '05: GIS and spatial analysis, Annual Conference of the International Association for Mathematical Geology, Toronto, Canada, August 21-26, v. 2, p. 874-879.

Duncan, I. J., 2005, Liability for digital datasets created by government agencies, in Proceedings, IAMG '05: GIS and spatial analysis, Annual Conference of the International Association for Mathematical Geology, Toronto, Canada, August 21-26, v. 2, p. 867-873.

Duncan, I. J., 2005, Negligence and professional malpractice related to GIS datasets: Digital Mapping Techniques 2005, U.S. Geological Survey, USGS Open File, unpaginated

Duncan, I. J., 2004, Serving the environment by turning a waste stream into a profit stream: The University of Texas at Austin, Bureau of Economic Geology Annual Report, p. 15-19.

Duncan, I. J., Soller, D. R., Ellis, R., Giglierano, J., and Hess, R., 1999, Proposed 1999 guidelines for inclusion of digital map products in the National Geologic Map Database, in Digital mapping techniques: U.S. Geological Survey Open File Publication 99-386.

Duncan, I. J., and Kelley, S. A., 1984, Tectonic history of the Rio Grande Rift derived from apatite fission tracks: New Mexico Geological Society Guidebook, v. 2, p. 1-21.

Duncan, I. J., 1978, Structural geology of the Big Ledge area, in Geological field work, 1977: British Columbia Ministry of Mines Petroleum Research Annual Report, p. 80-82.

Duncan, I. J., 1977, The Hawkesbury Sandstone: a critical review of proposed environmental models: Australian Journal of Earth Sciences, v. 24, p. 117-119.

Contract Reports

Ambrose, W. A., Smith, D. C., Cutright, B. L., Scanlon, B. R., Reedy, R. C., Elliott, B. A., Paine, J. G., Foss, M. M., Tremblay, T. A., Wolaver, B. D., Loucks, R. G., Frébourg, G., Hentz, T. F., Ogiesoba, O. C., Olariu, M. I., Fu, Q., Zeng, H., E. L. Frost, III, Hamlin, H. S., Nance, H. S., Duncan, I. J., Hammes, U., Rogers, H., Clift, S. J., Sivil, J. E., Zhang, T., Reed, R. M., Baumgardner, R. W., Jr., Eastwood, R., Breton, C., Rowe, H. D., Carr, D. L., Dunlap, D. B., Gale, J. F. W., and Peng, S., 2014, State of Texas Advanced Resource Recovery (STARR) progress report: Bureau of Economic Geology, Biennium prepared for Texas State Comptroller of Public Accounts, 90 p.

King, C. W., Duncan, I. J., and Webber, M. E., 2008, Water demand projections for power generation in Texas: The University of Texas at Austin, Bureau of Economic Geology, report prepared for Texas Water Development Board, under contract no. 0704830756. Available at: http://www.seco.cpa.state.tx.us/publications/renewenergy/, unpaginated.

Nicot, J. -P., Choi, Jong-Won, Ghomian, Yousef, and Duncan, I. J., 2008, Impact of mixed gas stream on CO2 plume characteristics during and after carbon storage operations in saline aquifers: The University of Texas at Austin, Bureau of Economic Geology, final report Chevron Energy Technology Company, Houston, Texas, 137 p. + 2 DVD's.

Nicot, J. -P., and Duncan, I. J., 2006, Preliminary CO2 storage outlook in Matagorda and surrounding counties, Texas: The University of Texas at Austin, Bureau of Economic Geology, final report prepared for Sargent & Lundy LLC, 42 p.

Paine, J. G., Ruppel, S. C., Nance, H. S., Smyth, R. C., Breton, Caroline, and Duncan, I. J., 2006, Subsurface data response, Odessa Site, Texas: The University of Texas at Austin, Bureau of Economic Geology, report prepared for the FutureGen Alliance, 113 p.

Published Reports

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