

MR. CHRISTIAN J. STEWART, M.Sc.

EDUCATION

- ◆ **Master of Science** in Physical Geography, with specialty in Coastal Geomorphology and Management
University of Guelph, Guelph, Ontario, Canada

Thesis: A Nearshore Morphology and Collective Alongshore Sediment Movement, Long Point Lake Erie.

- ◆ **Bachelor of Science (Honours)** in Physical Geography and Geology
McMaster University, Hamilton, Ontario, Canada

OTHER EDUCATION

- ◆ SPANS - GIS Training Course.
- ◆ Geographic Information Systems - An Overview for Contemporary Managers, University of Guelph.
- ◆ GIS Concepts and Coastal Applications, Simon Fraser University.
- ◆ Getting to Know Desktop GIS - ArcView.
- ◆ Learning Internet Basics, Great Lakes Information Network Workshop.
- ◆ Tackling Advanced HTML, Great Lakes Information Network Workshop.
- ◆ DUCK '94 Cross-Shelf Sediment Transport Study, U.S. Army Corps of Engineers Field Research Facility, Duck, North Carolina.
- ◆ ISO 14000 Awareness Workshop.
- ◆ Coastal Engineering for the Great Lakes, University of Wisconsin.
- ◆ Short Course on Coastal Protection, Delft University, The Netherlands
- ◆ IBM Visual Data Explorer Training Course, Royal Roads University, Victoria, BC
- ◆ Managing Multiple Projects, Objectives and Deadlines, Skillpath Seminar
- ◆ Don't Sweat the Small Stuff, It's All Small Stuff, Skillpath Seminar
- ◆ Dealing Effectively With Unacceptable Employee Behavior, Skillpath Seminar
- ◆ Size-Up: Diagnose and Build Your Business Success, TD Bank Management Seminar, Victoria

PROFESSIONAL SKILLS

- ◆ Training and practical experience in the areas of glacial, fluvial, and coastal geomorphology, hydrology, soils, sedimentology, structural geology, remote sensing, and climatology.
- ◆ Strong knowledge of computer software and operating systems including **Windows 95, Windows 3.x, DOS 6.22**, word processing, spreadsheets and databases (**Excel, Quattro Pro, MS-ACCESS, SQL, Lotus 1-2-3, dBase**), Internet access, HTML programming and WWW editors, electronic mail, graphics, and Geographic Information Systems (**ArcView**).
- ◆ Excellent communicator (written and oral). Effective presenter. Authored and presented academic and professional research findings.
- ◆ Ability to liaise productively with multi-faceted public interest and professional groups and in multi-disciplinary environments.



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- ◆ Flexible and resourceful problem solver who has been involved intensively in highly visible, multi-disciplinary geological and geographical studies.
- ◆ Proven ability to work effectively in team settings, or on an independent basis, in both office and field settings.
- ◆ Utilized a wide variety of field equipment including: surveying gear, sediment sampling equipment, water level and wave recorders, electromagnetic/mechanical current metres, and SCUBA gear.

CONSULTING PROJECT EXPERIENCE

As President of **Christian J. Stewart Consulting**, Mr. Stewart has participated in a wide range of consulting projects since the late 1980's, with a particular focus on the fields of coastal processes, shoreline management, coastal planning and analysis, flood and erosion hazard studies, environmental impact assessment, GIS application and development, environmental database application development, internet development and related topics.

Coastal, Environmental and GIS Project Experience

- ◆ **Mapping and Classification of Shoreline Protection Structures and Recreational Boating Facilities, U.S. Army Corps of Engineers - Detroit District:** Utilized air photo and video analysis to classify and map shoreline protection structures in four drowned river mouth areas along the Lake Michigan shoreline in Michigan and Wisconsin. Mapping was completed in Arc View GIS format.
- ◆ **Development of Continuous GIS Coverages for Shoreline Type, Shoreline Protection, Nearshore Geology and Recession Rates, Lake Michigan Shoreline, U.S. Army Corps of Engineers - Detroit District:** Created continuous GIS coverages in Arc View GIS format for a range of coastal zone data for Lake Michigan shorelines in Ottawa and Allegan County, Michigan and Sheboygan, Ozaukee and Manitowoc Counties in Wisconsin.
- ◆ **Detailed Mapping and Classification of Shoreline Protection Structures and Historical Trends, Lake Michigan Shoreline, U.S. Army Corps of Engineers - Detroit District:** Completed detailed mapping of open coast shore protection structures in place along the Lake Michigan shoreline in Ottawa and Allegan County Michigan and Sheboygan, Ozaukee and Manitowoc Counties in Wisconsin. Analysis of the changes in shore protection over the past ten years was completed. Mapping of structures was completed in Arc View GIS format.
- ◆ **Development of a Zambezi River Wetland Information System, World Conservation Union (IUCN):** Assisted in the collection, compilation and analysis of a range of natural resource information (maps, photos, videos, reports, etc.) for input into an Internet and CD-ROM based Wetland Information System for the Zambezi River basin in Southern Africa.
- ◆ **Development of a Revised Geomorphic, Shore Protection and Nearshore Classification System for the Lake Erie, Lake Ontario, Niagara River and St. Lawrence River Shoreline, U.S. Army Corps of Engineers - Buffalo District:** Utilized various data sources to conduct a detailed classification of shoreline attributes along portions of the Great Lakes shoreline under the jurisdiction of the USACE Buffalo District. Detailed and summary statistics of classification types were prepared.



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- ◆ **Collection and Analysis of Coastal Zone Data, Lake Erie and Ontario, U.S. Army Corps of Engineers - Buffalo District:** Compiled extensive database of natural resource, land use and physical process data for U.S. Lake Erie and Ontario Shorelines and developed a database management system in FoxPro to allow data analysis and query generation. Database was linked to Quikmap GIS for data visualization and mapping purposes.
- ◆ **Development of a Revised Geomorphic, Shore Protection and Nearshore Classification System for Lake Michigan, U.S. Army Corps of Engineers - Detroit District:** Utilized various data sources to conduct a detailed classification of shoreline attributes along the Lake Michigan shoreline. Detailed and summary statistics of classification types were prepared.
- ◆ **Lake Michigan Potential Damages Study, U.S. Army Corps of Engineers – Detroit District:** Participating as a lead consultant in a three-year multi-agency, multi-disciplinary investigation of erosion processes, potential erosion damages and water level impacts of the entire shoreline of Lake Michigan. Includes activities related to classification of the shoreline, analysis and assessment of long-term and short-term recession rates, land use and land use trend analysis, and development of GIS and modeling applications.
- ◆ **Development of Recession Rate Analysis System, U.S. Army Corps of Engineers - Detroit District -** Compiled extensive database of natural resource, land use and physical process data for Lake Michigan Shoreline and developed a database management system in FoxPro to allow data analysis and query generation. Database was linked to Quikmap GIS for data visualization and mapping purposes.
- ◆ **Review of Potential Data Sources for Use in the Determination of Pre and Post-regulation Recession Rates on Lake Ontario, Lower Great Lakes Erosion Study, U.S. Army Corps of Engineers - Buffalo District:** Reviewed various literature and GIS and aerial photographic data sources that would be useful in conducting an analysis of historic recession rates on Lake Ontario.
- ◆ **Great Lakes Shoreline Data Collection Form, U.S. Army Corps of Engineers - Detroit District:** Developed an MS-Access based form for the field collection of a range of site specific coastal zone data including shore protection type and quality, shore type and potential damage information.
- ◆ **1999 Canadian Coastal Conference, Victoria BC:** Organized and chaired the bi-annual conference of the Canadian Coastal Science and Engineering Association. Involved 90 participants from across Canada and the United States, as well as a number of international delegates. Organization activities included paper scheduling and coordination, editing and assembly of conference proceedings, accommodation, facility and meal coordination, budgeting, preparation of announcements and advertising and other host activities.
- ◆ **Ad-Hoc Task Group, Incremental Approach to Lake Ontario Criteria Review, International Joint Commission - Ottawa:** Advised staff of the IJC as to the various tasks and data required to conduct an assessment of flood, erosion and environmental impacts that might occur given changes to the criteria used in the Orders of Approval for the regulation of water levels and flows in the Lake Ontario - St. Lawrence River system, as well as impacts that may be due to possible climate change/variability scenarios.
- ◆ **Great Lakes Public Information Map of Shore Type, Erosion and Accretion, U.S. Geological Survey:** Assisted the U.S. Geological Survey, the U.S. Army Corps of Engineers and the University of Virginia in the compilation of U.S. and Canadian data for incorporation to a public information map on Great Lakes shore type, erosion and accretion.



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- ◆ **GIS Strategic Plan Development, City of Victoria, British Columbia:** CJS assisted the City of Victoria in developing the City's GIS Strategic Plan. This project evaluated the historical and current use of GIS within each department of the City and the future expectations for GIS.
- ◆ **Data Service Centre Implementation Project Communication Activities, British Columbia Ministry of Forests:** Responsible for the provision of all internal and external Ministry communications related to the DSCIP project, a major GIS and geomatics restructuring and reorganizational activity throughout all MOF regions and districts within the Province. Activities include newsletter and journal article preparation, WWW page development and maintenance, preparation of Ministerial briefings, preparation of presentations and other internal MOF communication documents.
- ◆ **Preparation of GIS Project Management Guidelines, British Columbia Ministry of Forests:** Prepared a series of project management guidebooks for use by Prince Rupert Forest Region staff in planning and conducting GIS forestry and land management projects.
- ◆ **Provision of Project Management and Marketing Activities, Hegyi GeoTechnologies International (HGI):** Carried out marketing and project management services for HGI, a small software development company specializing in the development of wireless communication technologies, GIS and field based data collection and transmission software. Included client liaison, proposal writing, and preparation and development of marketing materials.
- ◆ **Submersible Investigation of Glacial and Post-Glacial Geologic Features, Fathom Five National Marine Park:** Assisted the Geological Survey of Canada, Parks Canada and the Ontario Marine Heritage Committee in the observation and interpretation of submerged geological features.
- ◆ **Coastal Processes Study and Breakwater Impact Assessment, Jackson's Point, Lake Simcoe:** Investigated coastal processes along this section of Lake Simcoe shoreline and utilized wave refraction modeling to examine the potential impacts of a proposed marina breakwater on sedimentation patterns and impacts to adjacent shorelines.
- ◆ **Carrying Capacity of Shoreline Environments:** Conducted a literature review to determine the nature and extent of research conducted on the topic of recreational carrying capacity, specifically as it applies to development and recreation in coastal environments.
- ◆ **Review and Synthesis of Geology, Physiography, Soils, Climate, and Air Quality Information, West-Central, Manitoba:** Reviewed and summarized geologic and other information for inclusion in the REPAP Manitoba Forest Management License Agreement 13-Year Operating Plan and Environmental Impact Statement.
- ◆ **Review and Synthesis of Geology, Physiography, Soils and Biotic Information, City of Mississauga Natural Areas Study:** Reviewed and summarized geologic and other information for inclusion in a comprehensive inventory and assessment of all natural areas within the City of Mississauga, Ontario.
- ◆ **Collection of Canadian Great Lakes Shoreline Recession Data:** Involved the collection of all existing shoreline recession rate data for each of the five Great Lakes for delivery to the United States Geological Survey and the University of Virginia for the production of public information maps on erosion hazards.
- ◆ **Collection and Analysis of U.S. Great Lakes Shoreline Recession Data:** Involved the collection, analysis and



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coordination of all existing shoreline recession rate data for each of the eight Great Lakes States and the incorporation of this data into the GIS data base of the U.S. Army Corps of Engineers.

- ◆ **Underwater Geomorphological Inventory, Fathom Five National Marine Park:** Provided diving and professional services in order to inventory, describe and interpret various underwater geomorphological and geological features found within the boundaries of Fathom Five National Marine Park.
- ◆ **Great Lakes Flood Threshold Examinations:** Using the location, data, and water levels from flood events along the Canadian shore of the Great Lakes, determined flood damage thresholds in order to identify and compare water levels at which static and storm-induced high water impact shoreline interests on several shore reaches of Lakes Erie, Huron, Ontario, and St. Clair.
- ◆ **Shoreline Classification and Mapping Project:** Developed and refined a shoreline classification scheme for the Great Lakes shoreline and administered the application of this scheme to the shoreline in order to map and identify the frequency and distribution of various shore types throughout the basin.
- ◆ **Erosion Processes Evaluation:** Supervised the application of a numerical cross-shore profiling model to determine potential changes in recession rates of various Great Lakes shoreline types with changes in water level regimes.
- ◆ **Inventory and Assessment of Shoreline Management Practices:** Co-ordinated a bi-national effort to inventory and assess specific shoreline management practices in place throughout the Great Lakes basin, including the provision of information on the impacts of these practices on various interest groups and the natural environment.
- ◆ **Great Lakes Flooding Emergency Action Plan:** Prepared a document describing the roles and responsibilities of federal and provincial agencies in a Great Lakes - St. Lawrence River flooding emergency and described crisis response measures to be put in effect at certain water level stages.
- ◆ **Inventory and Assessment of Crisis Condition Measures:** Completed an inventory and assessment of specific landside crisis responses to extreme water level fluctuations, including information on their extent, effectiveness and costs. Such measures included emergency response plans, storm forecasting networks and various low or high water assistance programs.
- ◆ **Lake Huron Shoreline Processes Study:** Finalized a report for four of Ontario's Conservation Authorities describing coastal processes and providing shoreline management recommendations for a 180 km length of shoreline in southeast Lake Huron.
- ◆ **Lake Huron Shoreline Erosion Hazard Delineation Study:** Utilized a Geographic Information System to analyze and predict long-term Great Lakes Shoreline recession rates for the St. Clair Region Conservation Authority and the Ministry of Natural Resources.
- ◆ **Water Recreation Capacity Study, Trent Severn Waterway (Parks Canada):** Prepared and administered a field survey questionnaire to assess recreational boaters attitudes, expectations and perceptions regarding a number of issues including overcrowding of the waterway, types and frequency of conflicts, desired experiences, and suggestions for improved waterway management.



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- ◆ **Shore Property Owner Survey:** Assisted staff of Environment Canada in the administration of telephone survey designed to assess the perceptions and attitudes of shore property owners in the Great Lakes to the issue of high water levels.
- ◆ **Great Lakes Riparian Survey and Census:** Assisted Environment Canada in the development and administration of survey questionnaires to over 24,000 Ontario shoreline property owners to assess damages experienced by high and low water levels and riparian opinion on measures that could be taken to alleviate such damages.
- ◆ **Lake Superior Canadian Commercial and Industrial Shore Property Survey:** As part of an IJC investigation into the potential impacts of storing water on Lake Superior above the maximum called for in the present regulation plan, undertook a shore property potential damage survey of the Canadian shoreline of Lake Superior with a particular focus on commercial, industrial and recreational properties. Collection of data for the study was undertaken through the identification of affected properties and buildings, the preparation and mailing of a questionnaire to property owners and a field survey of the Lake Superior shoreline.

Internet Application and Development Project Experience

- ◆ **Web Site Development, Section 227 National Shoreline Erosion Control Development and Demonstration Program (<http://www.cjscons.com/SEC227> - in development):** CJS has primary responsibility for the design and development of this web site which features a wealth of information on state-of-the-art and innovative shoreline protection techniques in place on the coastlines of the United States. The web site is being developed for the U.S. Army Corps of Engineers Coastal and Hydraulics Lab in Vicksburg, Mississippi and features an interactive database of shore protection examples, as well as a series of tutorials and educational information.
- ◆ **Web Site Development, Lower Great Lakes Erosion Study (<http://www.cjscons.com/LGLES>) :** CJS has had primary responsibility for the design of this web site which features a range of information on a scientific and engineering study being undertaken by the U.S. Army Corps of Engineers Buffalo District along the shorelines of Lake Erie and Ontario. Mr. Stewart was responsible for all graphics development, document conversion and the creation of a "virtual tour" of the shoreline featuring photographs and detailed site descriptions of 30 site study areas.
- ◆ **Web Site Development, Lake Michigan Potential Damages Study (<http://huron.lre.usace.army.mil/coastal/LMPDS>):** CJS has had primary responsibility for the design of this web site which features a range of information on a scientific and engineering study being undertaken by the U.S. Army Corps of Engineers Detroit District along the shoreline of Lake Michigan. The site features a wealth of information on complex scientific and engineering studies being undertaken and includes a document clearinghouse as well as on-line PowerPoint presentations. This site has been maintained by Mr. Stewart for the past three years.
- ◆ **Zambezi Wetlands Information Management System (Z-WIMS):** Z-WIMS is an Internet based mapping and multi-media information system designed for IUCN (The World Conservation Union). The system allows users such as project managers, funding agencies, stakeholders and the public, query the extensive database and view IUCN activities across the entire Zambezi River Basin. Users can select to view interactive web maps, videos, photographs, reports, articles and newsletters, all relating to work in the Zambezi River Basin of Southern Africa.
- ◆ **Development of an Internet Based Employee Survey, Santa Clara County, California Social Services Agency:** In cooperation with a Sacramento, CA survey research firm, developed and administered an on-line survey of approximately 800 employees in the Santa Clara County Social Services Agency's Department of Family and



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Children's Services. The survey results will assist the department in evaluating it's long term programs, internal structures and future directions. Survey results are automatically submitted through the web interface directly into an MS-ACCESS database for later analysis.

- ◆ **Web Site Development, Walter R.McDonald and Associates (www.wrma.com):** Responsible for web site development including graphics for this health and human services consulting firm located in Sacramento, California.
- ◆ **Development of Internet Based Community Employer Survey, City of Surrey, Langley and Richmond, B.C.:** CJS assisted in the development and conduction of an internet based market research survey of pertinent labour market information from businesses in the B.C. communities of Surrey, White Rock, North Delta, Richmond and Langley for Human Resources Development Canada (HRDC). A unique component of the survey was the development and application of a World Wide Web questionnaire that was administered to those businesses with Internet capabilities, and the creation of a fully searchable database of survey results and associated reports that will be available to the public through the Internet. The project also involved the development of an internal Community Employer System, developed in FoxPro, that will allow HRDC staff to conduct detailed queries and reports on the survey data.
- ◆ **Development of Internet Based Lower Occupational Survey, Lower Mainland Regions of HRDC:** Similar to the Community Employer Survey, this project involved the development of a web based survey and related Internet searchable database of Occupational Profile information. An internal MS-Access database was also developed for the use of HRDC staff in developing detailed Occupational Profiles.
- ◆ **1999 Canadian Coastal Conference Web Site, Victoria BC:** Organized and chaired the bi-annual conference of the Canadian Coastal Science and Engineering Association. Involved 90 participants from across Canada and the United States, as well as a number of international delegates. Organization activities included paper scheduling and coordination, editing and assembly of conference proceedings, accommodation, facility and meal coordination, budgeting, preparation of announcements and advertising and other host activities. Also responsible for the development and maintenance of the conference web site.
- ◆ **QuikMap Technologies Inc. Internet Site Design and Maintenance (www.quikmap.com)**

OTHER EMPLOYMENT EXPERIENCE

Director **1998-2000**
Orca Technologies International Inc.

Mr. Stewart provided administrative and project management support to Orca Technologies International Inc., a multi-disciplinary information technology company providing a range of product development and consulting services to the environmental (coastal, forestry, impact assessment), financial, business, and social sectors. The company's focus was on the production of data tracking and management software and the provision of information technology consulting services including Internet technology, database management systems, and Geographic Information Systems.

Director **1997-1998**



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VGI Vision Group International Inc.

Mr. Stewart provided administrative and project management services to VGI Vision Group International, a multi-disciplinary firm providing a range of consulting, geomatics, database management and information systems services. Areas of consulting expertise included coastal and ocean processes and management, environmental impact assessment, flood and erosion hazard assessment, forestry planning, GIS application and development, and land use mapping and analysis. Database management and information systems services were focused around financial and human resource management systems, environmental information systems, GIS applications and user needs analyses, and relational database (FoxPro, Access) development and customization.

Project Manager

1996

Hegy Geotechnologies International Inc. (HGI)

Carried out marketing and project management services for HGI, a small Victoria B.C. based software development company specializing in the development of wireless communication technologies, GIS and field based data collection and transmission software. Included client liaison, proposal writing, and preparation and development of web-based and standard marketing materials.

Environment Canada

1991-1993

Canada Centre For Inland Waters

Provided consulting services to Phase II of the International Commission Great Lakes - St. Lawrence River Water Level Reference Study. Responsibilities included chairing bi-national task groups, working as a member of other task groups, preparing reports for the International Joint Commission.

Director, Coastal and Marine Division

1989-1991

F.J. Reinders and Associates Canada Limited

Supervised engineering and technical staff responsible for various coastal and marine projects, including the examination of coastal and estuarine processes, the design and construction of coastal and marine shoreline protection structures, hydraulic modeling studies and waterfront and harbor planning and design activities. Other responsibilities included marketing and promotion and various management and administrative activities.

Coastal Geographer

1986-1989

Environment Canada, Canada Center for Inland Waters

As part of Phase I of the International Joint Commission Great Lakes Water Level Reference assessed the social, economic and physical impacts of fluctuating Great Lakes water levels on commercial and industrial shoreline interests. Assessed the physical impacts of fluctuating water levels on the coastal zone of the Great Lakes. Other related duties included providing advisory and educational services to the public in the field of coastal processes and water level forecasting, writing departmental monthly reports, and conducting interviews with radio and newspaper personnel interested in the water level issue.



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Coastal Geomorphologist 1986
MND Associates

Conducted wave refraction and shoreline erosion modeling at Burloak Beach, Lake Ontario. This involved analysis of wind, wave and bathymetric data for input into computer, input of data and analysis of computer output.

Coastal Geomorphologist and Teaching Assistant 1984-1986
Department of Geography, University of Guelph

Conducted various duties related to the study of coastal geomorphology at Wasaga Beach and Long Point, Ontario. This included topographic surveying of beach profiles, echo sounding, instalment and operation of current meters and wave recording devices, sediment sampling and coring, analysis of collected data and samples and various computer work. Also taught introductory geography, geomorphology and climatology laboratories to first year students.

Field Assistant 1983
Department of Geography, McMaster University

Carried out Forest Ecosystem Classification and ground truthing of LANDSAT data near Cochrane, Ontario. This included soil surveying, plant species identification, hill slope measurement and other field work related to forestry research.

COMMITTEE INVOLVEMENT

- ◆ Director, West Coast Region, **Canadian Coastal Science and Engineering Association (CCSEA)**, 1997-Present.
The CCSEA provides a forum to address issues relevant to Canada's coastal zones (Atlantic, Pacific, Great Lakes and Arctic) - bringing together scientists, engineers and managers from a broad range of disciplines. CCSEA provides this forum by organizing national conferences and regional workshops, promoting Canadian coastal issues, and exploring opportunities for research funding.
- ◆ Member, **Science Committee of the 4th International Symposium on the Application of GIS to the Coastal Zone - CoastGIS 2001**, 1999-Present.
To be held at Bedford Institute of Oceanography, 2001. Sponsored by the Marine Cartography Commission of the International Cartographic Association and the Coastal Systems Commission of the International Geographical Union. The committee assists in establishing the themes, suggests invited speakers, reviews abstracts for presentations and posters, and makes recommendations about their acceptance.
- ◆ Member, **Advisory Committee - Centre For Environmental Information Management**, Royal Roads University, Victoria, British Columbia, 1996
Advised and assisted staff of Royal Roads University in the development and implementation of a GIS based education, information management, and information technology facility.
- ◆ Vice-Chair, **Environmental Advisory Committee**, City of Guelph, Ontario, 1995-1996
Reviewed and assessed planning and development applications in regard to potential environmental impacts of



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proposed developments. Made recommendations to City Council regarding said impacts

- ◆ Steering Committee Member, **Environmental Business Network**, City of Guelph, Ontario, 1995-1996
Identified opportunities for environmental sector business development and retained, expanded and attracted environmentally based businesses to the City of Guelph and surrounding region. Coordinated and planned monthly speaker sessions and special workshops.
- ◆ Canadian Co-Chair, **Erosion Processes Task Group**, Working Committee 2, International Joint Commission Great Lakes Water Levels Reference Study, 1991-1993
Developed a comprehensive shoreline classification scheme for the Great Lakes and effectively coordinated a team of engineers, geologists and consultants in its application; Evaluated and assessed changes in the recession rates of different shore types to changes in water levels. Co-authored 100 page Task Group Report.
- ◆ Canadian Co-Chair, **Potential Damages Task Group**, Working Committee 2, International Joint Commission Great Lakes Water Levels Reference Study, 1991-1993
Coordinated a team of hydrologists, geologists, environmental planners and engineering consultants responsible for assessing past and potential damages in the Great Lakes as a result of fluctuating water levels, storm activity and erosion. Co-Authored Task Group Report.
- ◆ Member, **Land Use and Shoreline Management Task Group**, Working Committee 2, International Joint Commission Great Lakes Water Levels Reference Study, 1991-1993.
Documented and assessed land use patterns along the Great Lakes shoreline and conducted an inventory and assessment of shoreline management practices. Edited and compiled Task Group Report.
- ◆ Member, **Crisis Conditions Task Group**, Working Committee 2 and 3, International Joint Commission Great Lakes Water Levels Reference Study, 1991-1993.
Inventoried and assessed crisis condition responses to Great Lakes flood and high water level emergencies; Developed a Federal/Provincial Action Plan for flooding and high water level emergencies on the Great Lakes.
- ◆ Member, **Working Committee 2**, International Joint Commission Great Lakes Water Levels Reference Study, 1991-1993.
Developed and implemented study tasks and objectives of 5 separate Task Groups. Edited and compiled 300 page Working Committee Report summarizing the work of the 5 Task Groups.

PROFESSIONAL MEMBERSHIPS AND LICENSES

- ◆ Member of the Canadian Coastal Science and Engineering Association
- ◆ Member of the Coastal Zone Canada Association
- ◆ Member of the Coastal Education and Research Foundation (USA)
- ◆ Member of the Coastal Society (USA)
- ◆ Member of the Royal Canadian Geographical Society
- ◆ Professional Association of Diving Instructors (PADI) Open Water Diver
- ◆ American and Canadian Underwater Certification International (ACUC) SCUBA Diver I
- ◆ American and Canadian Underwater Certification International (ACUC) Rescue Diver



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- ◆ American and Canadian Underwater Certification International (ACUC) Advanced Scuba Diver
- ◆ American and Canadian Underwater Certification International (ACUC) Divemaster

PUBLICATIONS

Stewart, C.J., Duyndam, J.G., and Law, M.N., (submitted). **Coastal Zone GIS Database Development, Visualization and Distribution in the Great Lakes - The Lake Michigan Potential Damages Study and the Lower Great Lakes Erosion Study.** Paper submitted for Coastal Zone 2001 Conference, Cleveland, Ohio, July 2001.

Stewart, C.J., and Gauthier, R.L., (submitted). **Great Lakes Regional Coastal Studies.** Special Session Paper submitted for Coastal Zone 2001 Conference, Cleveland, Ohio, July 2001.

Stewart, C.J., and Law, M.N., (submitted). **Visualization, Distribution and Analysis of Great Lakes Coastal Zone Data Using Standard and Internet-Based GIS Tools - The Lake Michigan Potential Damages Study and the Lower Great Lakes Erosion Study.** Paper submitted for Coast GIS 2001 Conference, Halifax, Nova Scotia, June 2001.

Stewart, C.J., 2001 (editor). **Lake Michigan Potential Damages Study, Progress Report on Activities 2000.** Report prepared for the U.S. Army Corps of Engineers, Detroit District, 75pp.

Stewart, C.J., 2000. **But What Does It All Mean? Distilling the Science for Use on a Local Management Scale: Observations, Recommendations, and Examples of Information Sharing Tools.** Paper presented at the 5th Southwest Washington Coastal Erosion Study Workshop, November 15-17, 2000, Olympia, Washington, 8pp.

Stewart, C.J., 2000. **Inventory and Mapping of Shoreline Protection and Boating Structures in Drowned River mouth Areas of Lake Michigan.** Consulting Report prepared for the U.S. Army Corps of Engineers, Detroit District, 30pp., plus Appendices.

Stewart, C.J., 2000. **Open Coast Reach Delineation and Re-Attribution of Shore Classification Mapping, Lake Michigan Prototype Counties, Lake Michigan Potential Damages Study.** Consulting Report prepared for the U.S. Army Corps of Engineers, Detroit District, 45pp., plus Appendices.

Stewart, C.J., 2000 (editor). **Lake Michigan Potential Damages Study, Progress Report on Activities 1999.** Report prepared for the U.S. Army Corps of Engineers, Detroit District, 71pp.

Stewart, C.J., 1999. **A GIS Mapping Tool for the Presentation and Analysis of Coastal Data Along the Shorelines of the North American Great Lakes.** Proceedings of the 1999 Canadian Coastal Conference, Victoria BC, May 1999: P.487-498.

Stewart, C.J., 1999. **Development of a Coastal Zone Database and GIS Mapping Tool for the Analysis of Coastal Data Along the Shorelines of the North American Great Lakes.** Proceedings of GIS99 - Thirteenth Annual Conference of Geographic Information Systems, Vancouver BC, March 1999: p.130-134.

Pope, J., Stewart, C.J., Dolan, R., Peatross, J., and Thompson, C.L., 1999. **The Great Lakes Shoreline Type, Erosion and Accretion - Public Information Map Sheet.** United States Geological Survey, Department of the Interior.



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Stewart, C.J., 1999. **A Revised Geomorphic, Shore Protection and Nearshore Classification of the Lake Erie, Lake Ontario, Niagara River and St. Lawrence River Shorelines, Lower Great Lakes Erosion Study.** Consulting Report prepared for the U.S. Army Corps of Engineers, Buffalo District and Coastal and Hydraulics Lab, 53pp., plus Appendices.

Stewart, C.J., 1999. **A Review of Potential Data Sources for Use in the Determination of Pre and Post-regulation Recession Rates on Lake Ontario, Lower Great Lakes Erosion Study.** Consulting Report prepared for the U.S. Army Corps of Engineers, Buffalo District and Coastal and Hydraulics Lab, 42pp.

Stewart, C.J., 1999. **Detailed Mapping and Classification of Shoreline Protection Structures, Lake Michigan Potential Damages Study.** Consulting Report prepared for the U.S. Army Corps of Engineers, Detroit District, 33pp., plus Appendices.

Stewart, C.J., 1999 (editor). **Proceedings of the 1999 Canadian Coastal Conference, Victoria, B.C.** Canadian Coastal Science and Engineering Association, 944pp.

Stewart, C.J., 1999. **Lake Michigan Potential Damages Study - Progress Report on Activities 1996-1998.** Consulting Report Prepared for USACE Detroit District, Contract DACW35-98-P-0142, 67pp.

Stewart, C.J., 1998. **Lake Ontario and Lake Erie Data Collection Activities - Lower Great Lakes Erosion Study.** Consulting Report Prepared for USACE Buffalo District, Contract DACW39-97-D-0007, Delivery Order #4, 54pp., plus Appendices.

Stewart, C.J., 1998. **A Revised Geomorphic, Shore Protection and Nearshore Classification of the Lake Michigan Shoreline - Lake Michigan Potential Damages Study.** Consulting Report Prepared for USACE Detroit District, Contract DACW35-98-P-0142, 19pp.

Stewart, C.J. and Healey, N., 1998. **The Development of an MS-Access Based Great Lakes Shoreline Data Collection System.** Consulting Report prepared for the U.S. Army Corps of Engineers, Detroit District, 24pp.

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