

## CURRICULUM VITAE: JAMES P.M. SYVITSKI

Last update Feb 1, 2011



**Title:** Executive Director, CSDMS — Community Surface Dynamics Modeling System & University of Colorado Professor

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<http://CSDMS.colorado.edu>

**Citizenship:** Dual – United States and Canada

**Professional Specialization:** *Oceanography, Geological Sciences, Hydrology, Numerical Modeling, Geophysics.*

**Research Interests:** *Fjords, Rivers, Deltas, Estuaries, Particle Dynamics, Sediment Transport & Stratigraphy, Continental Margins, Gravity Flows, Animal-Sediment Interactions,*

**Non-professional Interests:** *Guitarist; Sensei; Gardening; Literature*

### **Summary**

*I have expertise in earth system science, reflecting an education in the fields of quantitative Oceanography and Geoscience — achieving double bachelors and double doctorate degrees. I have worked in industry, academia, government, and as an environmental consultant. I work to balance applied and pure research, and economic potential given environmental concerns. I appreciate the multi-layered meaning of “the public good”.*

*I work in the forefront of Computational Geosciences: Sediment transport, land-ocean interactions and Earth-surface dynamics. I operate high performance computing clusters (HPCC). I rely less on established paradigms and remain flexible in my problem solving exercises, resulting in a well-cited (>4500) publication record. I have experience as a scientific editor (journals, books) and work with international publishing houses.*

*Science is a team effort, and I have appreciated being both a player and leader of large international scientific teams. My more than 150 co-authors come from industry, government, and academia and from many countries. Science is an international effort and I have been fortunate to work at a variety of levels in world scientific bodies (IUGS, IGBP, INQUA, LOICZ, IAS, GWSP). Canadian, Polish, Chinese and US scientific academies have sought my advice, on issues related to the environment and global change. I have provided confidential advice to the Canadian government, US Departments of Justice, Commerce, Interior and Defense. I respect their security arrangements and confidence.*

*I supervise graduate students, post-graduate fellows, technicians, software engineers, research & teaching faculty, finance, clerical & IT staff. As Head, Sediment Dynamics (Geological Survey of Canada - Atlantic), I coordinated staff engaged in environmental marine issues: tidal power, iceberg scouring of the seafloor, cable routing, and slope stability problems. As Director of INSTAAR, a CU research Institute, I coordinated 300 employees and affiliates, 94 are at the Ph.D. level, with faculty from 7 academic departments. INSTAAR specializes in Earth and environmental system science. As Executive Director of CSDMS — Community Surface Dynamics Modeling System, I coordinate 500+ scientists from 230+ institutions located in 20+ countries, in an international effort to develop, support, and disseminate integrated software modules to the Geoscience community. CSDMS promotes the modeling of earth surface processes, with emphasis on the movement of fluids, sediment and solutes through landscapes, seascapes and sedimentary basins. I am presently Chair-elect of the International Council of Sciences Global Change IGBP whose vision is to provide essential scientific leadership and knowledge of the Earth system to help guide society onto a sustainable pathway during rapid global change.*

*I believe in focused and intense science, yet science that can be easily understood by, and justified to, the public. I enjoy simplifying science for others and strongly believe in educating the public on science issues.*

### **Active Professional Memberships**

*IAS: International Association of Sedimentologists*

*TOS: The Oceanographic Society*

*IMAG: International Association of Mathematical Geology*

*SEPM: Society of Sedimentary Geology*

*AGU: American Geophysical Union*

## EDUCATION

B.Sc.	Lakehead University	1974	Geology, Mathematics	First Class Standing
H.B.Sc.	Lakehead University	1975	Geology	First Class Standing
Ph. D.	U. British Columbia	1978	Oceanography, Geological Sciences	

### Theses:

*H.B.Sc. Water-Sediment Interactions in a Fresh Water Environment: Western Thunder Bay*  
**Honors Thesis Advisor: Professor J.D. Mothersill, Lakehead University, Canada, 1974-75**

*Ph.D./Ph.D. Sedimentological Advances Concerning the Flocculation and Zooplankton Pelletization of Suspended Sediment in Howe Sound, British Columbia: A Fjord Receiving Glacial Meltwater*  
**Graduate Thesis Advisor: Professor J.W. Murray, U. British Columbia, Canada, 1975-78**

### Courses Taken:

General	Geology	Mathematics	Sed - Stratigraphy	Geochemistry	Geophysics	Oceanography
Astronomy	Intro Geology	Dif. Calculus	Sed. & Strat.	Phys. Chemistry	General Physics	Synoptic Ocgy
Phys Geog	Structural Geology	Comp. Science	PreCamb. Strat.	Geochemistry	Exploration GP-1	Chemical Ocgy
Russian	Crystallography	Theory Dif. Eqns.	Phanerozoic Strat.	Unstable Isotopes	Electricity & Magn.	Biological Ocgy
	Ore Microscopy	Prob. & Statistics	Seminar in Sed.	Stable Isotopes	Physics of the Earth	Marine Geology
	Mineral Deposits	App. Comp. Sim.	Problems in Sed.	Colloidal Prop.	Exploration GP-2	Dynamic Ocgy
	Petrology	Applied Dif Eqns	<b>Thesis</b>	<b>Thesis</b>		<b>Thesis</b>
	Petrography & Min.	Fortran				
	Metamorphic Pet.	Geomathematics				

## ACADEMIA

### Courses Taught:

<i>Geology for Engineers</i>	University of Calgary	2nd year
<i>Sedimentary Petrology</i>	University of Calgary	3rd year
<i>Field School</i>	University of Calgary	3rd year
<i>Sedimentary Environments</i>	University of Calgary	4th year
<i>Advanced Geomathematics</i>	University of Calgary	graduate
<i>Advanced Clastic Sedimentology</i>	University of Calgary	graduate
<i>Intro to Oceanography</i>	University of Colorado	3rd year
<i>Quantitative Dynamic Stratigraphy</i>	University of Colorado	graduate
<i>High Latitude Glacimarine Processes</i>	University of Colorado	graduate
<i>Oceanography</i>	University of Colorado	senior & graduate
<i>Polar Marine Sedimentary Environments</i>	University of Tromsø	graduate
<i>Modeling Margins: Sources to Sink</i>	Delft Univ. of Technology	graduate
<i>Modeling Margins: Sources to Sink</i>	CNRS/IGM-Bologna	graduate
<i>Modeling Margins: Sources to Sink</i>	University of Barcelona	graduate
<i>Source to Sink Modeling</i>	GNS, Wellington	professional
<i>Earth-Surface Dynamics Modeling</i>	NCED/CCED, Minneapolis	graduate
<i>Earth-Surface Dynamics Modeling</i>	RCEM, Santa Fe, Argentina	professional
<i>Earth-Surface Dynamics Modeling</i>	Future Ocean, Kiel Germany	professional
<i>Source to Sink Modeling</i>	Kangwon Natl Univ, Korea	graduate

### Graduate Student - Supervision

1995-99	Mark D. Morehead	Ph.D.	CU-Boulder	2004-07	Albert J. Kettner	Ph.D.	Delft U Tech
1996-01	Damian B. O'Grady	Ph.D.	CU-Boulder	2007-11	Mark T. Hannon	M.Sc.	CU-Boulder
1999-02	David Mixon	M.Sc.	CU-Boulder	2008-09	Scott Bachman	Ph.D.	CU-Boulder
1999-03	David Kinner	Ph.D.	CU-Boulder	2010—	Fei Xing	Ph.D.	CU-Boulder
2000-05	Gita Dunhill	Ph.D.	CU-Boulder	2010—	Ben Hudson	Ph.D.	CU-Boulder
2001-07	Eric W.H. Hutton	Ph.D.	CU-Boulder	2010—	Christina Sneddon	M.Sc.	CU-Boulder
2003-04	David Pyles	Ph.D.	CU-Boulder	2010—	Stephanie Higgins	Ph.D.	CU-Boulder
2004-07	Alex Sinclair	M.Sc.	CU-Boulder				

**Graduate Student - Examiner or Committee Support**

1985-86	Kenneth Asprey	M.Sc.	U Wales	1998-01	Micalea Smith	Ph.D.	CU-Boulder
1990-92	J. Berry	M.Sc.	Dalhousie U	1998-03	Greta Bjork	Ph.D.	CU-Boulder
1992-95	Jo Birch	Ph.D.	Dalhousie U	1999-00	Shane Elipot	Ph.D.	ENSIETA, Fr
1992-95	Ken Skene	Ph.D.	Dalhousie U	2000-02	Sarah Principato	Ph.D.	CU-Boulder
1992-93	Hazen Russell	M.Sc.	Laval U	2000-01	J. Scott Stewart	Ph.D.	CU-Boulder
1995-97	Andrew Stein	M.Sc.	CU-Boulder	2001-02	Isla Castenada	M.Sc.	CU-Boulder
1995-00	Donald Barber	Ph.D.	CU-Boulder	2001-02	Irina Overeem	Ph.D.	Delft U Tech
1995-96	Thomas Cooper	M.Sc.	CU-Boulder	2004-06	Ursula Quillman	M.Sc.	CU-Boulder
1996-00	Kathy Licht	Ph.D.	CU-Boulder	2002-07	Remco Groenenberg	Ph.D.	Delft U Tech
1996-97	Micalea Smith	M.Sc.	CU-Boulder	2008-09	Yun-zhen Chen	Ph.D.	Nanjing U
1996-97	Dan Levish	Ph.D.	CU-Boulder	2009-	Ursula Quillman	Ph.D.	CU-Boulder
1996-99	Brian Welch	M.Sc.	CU-Boulder	2011-	Andy Wickert	Ph.D.	CU-Boulder
1997-00	Stephanie Cartee	M.Sc.	CU-Boulder				

**Post-graduate Supervision**

1987-89	Jay Stravers	PDF	Bedford Inst Ocgy	2001-03	J. Scott Stewart	PDF	CU-Boulder
1993-95	Azetsu Scott	PDF	Bedford Inst Ocgy	2002-04	Irina Overeem	PDF	CU-Boulder
1994-95	Thierry Mulder	PDF	Bedford Inst Ocgy	2002-05	Yu'suke Kubo	PDF	CU-Boulder
1995-96	Hee Jun Lee	PDF	CU-Boulder	2007-10	Albert J. Kettner	PDF	CU-Boulder
1996-98	David Bahr	PDF	CU-Boulder	2009-	Beichuan Yan	PDF	CU-Boulder
1999-00	Scott Peckham	PDF	CU-Boulder	2010-	Maureen Berlin	PDF	CU-Boulder
2001-02	Damian O'Grady	PDF	CU-Boulder	2010-	Sagy Cohen	PDF	CU-Boulder

**University of Colorado Service (Selected)**

Director of INSTAAR	CU Foundation fundraising
Director of Environmental Computation & Imaging Facility	CU Research Cabinet
Environmental Program Advisory Committee	Program Review for CEA Engineering
Institute Directors Committee	Interdisciplinary Computational Science & Engineering SC
Graduate School Budget Committee	Dean's small grants Committee
East Campus Research Association	Total Learning Environment Scholar
Academic Affairs Budget Advisory Committee	Accounting Streamlining Project
Environmental Sciences Building Committee	Chair of Summer School Task Force
Administrator Appraisal Oversight Committee	Dept. Geological Sciences Executive Committee

**PROFESSIONAL EXPERIENCE**

<b>Industry:</b>	<b>Position Title</b>	<b>Employer</b>
1973,1975	Geophysicist, Geologist	Falconbridge Nickel Mines
<b>University:</b>		
1978-81	Assistant Professor (Geology & Geophysics)	University of Calgary
1989-95	Adjunct Professor (Geology)	Laval University
1989-95	Adjunct Professor (Oceanography)	INRS-oceanologie
1992-95	Adjunct Professor (Ocean Sciences)	Memorial University of NFLD
1993-97	Adjunct Professor (Earth Sciences)	Dalhousie University
1995-07	Director (INSTAAR)	University of Colorado at Boulder
1995-	Fellow (INSTAAR)	University of Colorado at Boulder
1995-	Professor (Geological Sciences)	University of Colorado at Boulder
1997-	Professor (Geophysics)	University of Colorado at Boulder
2007-	Adjunct Professor (Oceanography)	University of Colorado at Boulder
2007-	Executive Director (CSDMS)	University of Colorado at Boulder
2009-	Adjunct Professor (Applied Math)	University of Colorado at Boulder
<b>Government:</b>		
1974	Geochemist	Ontario Department of Environment
1976	Research Scientist	Geological Survey of Canada-Pacific
1981-95	Senior Research Scientist	Geological Survey of Canada-Atlantic
1982-85	Head: Sediment Dynamics Section	Bedford Institute of Oceanography

## Consulting

1980-81	Consultant	Canadian Marine Geotechnical Engineering
1992-93	Consultant	Department of Justice (U.S.)
2006-07	Consultant	Earth Tech
2010	Educational Consultant	ExxonMobil

## Journal Editorships

1982–1983	Guest Editor, <i>Sedimentary Geology</i> , Elsevier
1984–1988	Associate Editor, <i>Journal Sedimentary Petrology</i> , SEPM Society
1993–	Associate Editor, <i>Oceanography</i> , TOS
1995–1997	Editorial Board, <i>Arctic and Alpine Research</i> , Allen Press
1996–	Editorial Board, <i>Marine Geology</i> , Elsevier
1996–1998	Guest Editor, <i>Marine Geology</i> , Elsevier
1998–2000	Guest Editor, <i>Computers &amp; Geoscience</i> , Elsevier
1998–2002	Editor, <i>Arctic, Antarctic and Alpine Research</i> , Allen Press
2000–2003	Guest Editor, <i>Global &amp; Planetary Change</i> , Elsevier
2002–	Editorial Board, <i>Computers and Geoscience</i> , Elsevier
2002–	Editorial Board, <i>Chinese Journal of Oceanology and Limnology</i>
2004–2005	Guest Editor, <i>Oceanography</i> , TOS
2004–2005	Guest Editor, <i>Marine Geology</i> , Elsevier
2006–2008	Guest Editor, <i>Computers &amp; Geoscience</i> , Elsevier
2007–2009	Guest Editor, <i>Geochemistry, Geophysics, Geosystems (G<sup>3</sup>)</i> , AGU
2010–2011	Guest Editor, <i>Computers &amp; Geoscience</i> , Elsevier

## Professional Services

Steering Committee:	<i>Turbid Water Symposia</i> , 1982, Halifax, Canada
Symposia Chair	<i>Sedimentology of Fjords</i> , ISC, 1982, Hamilton, Canada
Chair	<i>Arctic Fjords</i> , GSC, 1983, Dartmouth, Canada
Technical Chair	<i>Arctic Land-Sea Interactions</i> , 1985, Dartmouth, Canada
Chair	<i>Particle Characterization</i> , IUGS, 1986-87, Dartmouth, Canada, Heidelberg, Germany
Session Chair	<i>Glaciomarine Processes</i> , Geol Soc, 1989, London, UK
Symposia Chair	<i>Glaciomarine Facies Models</i> , ISC, 1990, Nottingham, UK
Session Chair	<i>Record of the Continental Ice Sheets</i> , GAC, 1991, Toronto
Convener	<i>ONR STRATAFORM Modelers Workshops</i> , 1995-2000.
Convener:	<i>High res. seismic Stratigraphy of Quaternary deposits</i> , 1991-1996
Session Chair	<i>Quaternary Sedimentation</i> , GAC, 1992, Wolfville, Canada
Session Chair	<i>Numerical Modeling of Basins</i> , GAC, 1993, Edmonton, Canada
Session Chair:	<i>Numerical Experiments in Stratigraphy</i> , Lawrence, Kansas, 1996
Session Chair:	<i>High-resolution records of Climate from Marginal Seas</i> , GSA, Denver, 1996.
Session Chair:	<i>Geophysical Flows and Sediment Transport</i> , AGU, San Francisco, 1997.
Co-Convener:	<i>AOSB's Arctic Paleo River Discharge conference</i> , 1997, Boulder, CO.
Session Chair:	<i>STRATCON '98, IAS-SEPM</i> , 1998, Sicily
Steering Committee	<i>IGBP Land Ocean Interactions in the Coastal Zone 1998 - 2004</i>
Co-Convener	<i>The Oceanographic Society: Extreme &amp; Unexpected Phenomena</i> , Reno 1999
Convener	<i>IGBP-Water Group Sediments Meeting</i> , Boulder, CO 2000
Session Chair	<i>37<sup>th</sup> Society of Engineering Science: Sediment Transport</i> , Columbia, SC, 2000
Session Chair	<i>MSG Geological Society, Glacier-influenced Sedimentation</i> , Bristol, UK, 2001
Session Chair	<i>Changes in Climate &amp; Environment at High-Latitudes: Tromsø</i> , Norway, 2001
Session Chair	<i>Glacial Sediment Systems from Source to Sink</i> , AGU San Francisco, 2001
Session Chair	<i>Littoral Sediment Transport. EuroDelta Workshop</i> , Bologna, 2002
Session Chair	<i>Processes, record, utilization management of Continental Shelves</i> , Hong Kong, 2002
Session Chair	<i>Dynamics of the Coastal Zone, LOICZ Futures Meeting</i> , Miami, 2002.
Session Chair	<i>Sediment Transport and Deposition in Prodeltas Conference</i> , Aix, Fr, 2003
Session Chair	<i>Sedimentation and Architecture of European Margins</i> , AGU San Francisco, 2003
Session Chair	<i>Marine Records, 33<sup>rd</sup> Arctic Workshop</i> , Tromsø, Norway, 2003
Session Chair	<i>River-Estuary Interactions</i> , ERF, Seattle, 2003
Session Chair	<i>Coastal Processes and Evolution</i> , Oceans Conference, San Diego, 2003
Session Chair	<i>Mechanisms and Magnitudes: Global Water System Project: Portsmouth</i> , 2003
Session Chair	<i>Coupled process-response models</i> , IGC, Florence 2004

<i>Session Chair</i>	<i>Strata Formation on European Continental Margins, AGU San Francisco, 2004</i>
<i>Session Chair</i>	<i>34<sup>th</sup> Arctic Workshop, Boulder, 2004</i>
<i>Co-Chair</i>	<i>SCOR-sponsored Sediment Retention in Estuaries</i>
<i>Session Chair</i>	<i>Large Continental Rivers, AGU New Orleans, 2005</i>
<i>Ex-officio SSC</i>	<i>IGBP Land Ocean Interactions in the Coastal Zone 2005</i>
<i>Session Chair</i>	<i>LOICZ Ecological Dynamics of Deltas 2005, Egmond von Zee, Netherlands</i>
<i>Session Chair</i>	<i>Dynamics of the Adriatic, EuroSTRATAFORM, Salamanca, Spain, 2005</i>
<i>Session Chair</i>	<i>Particle Dynamics of Rivers, Coasts, Estuarine Morphodynamics – Urbana, 2005</i>
<i>Session Chair</i>	<i>Integrated Strata Analysis, IAS Congress, Fukuoka, Japan, 2006</i>
<i>Session Chair</i>	<i>New Models for Fluvial &amp; Coastal Sediment Transport &amp; Surface Dynamics, AGU San Fran, 2006</i>
<i>Session Chair</i>	<i>Sediment Transfer From Land Through the Ocean, AGU San Francisco, 2006</i>
<i>Convener</i>	<i>Dynamics and Vulnerability of River Delta Systems, GWSP/LOICZ/CSDMS, 2007, Boulder</i>
<i>Convener</i>	<i>Mechanisms of Sediment Retention in Estuaries, SCOR/LOICZ/CSDMS, 2007, Boulder</i>
<i>Steering Committee</i>	<i>Arctic Coastal Zones at Risk, LOICZ/IASC, Tromsø, Norway, 2007</i>
<i>Session Chair</i>	<i>IAHS Sediment Dynamics in Changing Environments, Christchurch, New Zealand, 2008</i>
<i>Session Chair</i>	<i>AAPG Deepwater Sedimentary Environments: Models vs Observations, 2009</i>
<i>Special Symposium</i>	<i>ISC: Advances in modeling morphodynamics &amp; sediment transport, Mendoza Argentina, 2010</i>
<i>Convener</i>	<i>CSDMS Modeling for Environmental Change, San Antonio TX 2010</i>
<i>Session Chair</i>	<i>Source to Sink Systems around the world and through time, Oxnard, CA, 2011</i>

### Funded Research Projects

#### Principal Investigator

<b>Period</b>	<b>\$Can</b>	<b>Agency</b>	<b>Research Site</b>	<b>Project Funded</b>
1978-79	\$20K	NSERC	University of Calgary	Sedimentation in Lakes
1979-80	\$50K	NSERC	University of Calgary	Particle Floatation
1981-89	\$820K	EMR	GSC	Sedimentology of Arctic Fjords Experiment
1982-89	\$190K	EMR	GSC	Suspended Particulate Matter In Situ
1986-95	\$1.1M	EMR	GSC	Transfer of Sediment from Land to Sea
1987-93	\$2.2M	multiple	GSC	ADFEX: Arctic Delta Failure Experiment
1992-95	\$700K	NRCan	GSC-Global Change	Marine Proxy Climatic Record & Models
1995	\$130K	ONR	GSC	STRATAFORM: Formation of strata on Margins
<b>Period</b>	<b>\$US</b>	<b>Agency</b>	<b>Research Site</b>	<b>Project Funded</b>
1996-99	\$110K	ONR	INSTAAR	Numerical Coupling of discharge to sedimentation models
1995-02	\$702K	ONR	INSTAAR	STRATAFORM
1997-98	\$91K	ONR	INSTAAR	Particle Dynamic Laser and Camera System
1997-99	\$360K	Mobil	INSTAAR	Data Base Development and Models for Stratigraphy
1998-99	\$135K	Raytheon	INSTAAR	Satellite Data Model Fusion: Littoral Sed. Transport
2000-01	\$1.1M	ONR&Sun	INSTAAR	Environmental Computation & Imaging (ECI) Facility
2000-04	\$650K	ONR	INSTAAR	Geoclutter: Buried Channels on Continental Shelves
2001-04	\$200K	ONR	INSTAAR	Sediment Flux to the Coastal Zone: Prediction for the Navy
2001-04	\$143K	NSF	INSTAAR+	MARGINS: Experimental and Theoretical Studies
2001-04	\$437K	ExxonMobil	INSTAAR	Development of 2D and 3D-SedFlux
2001-04	\$343K	ONR	INSTAAR+	Seabed variability and its influence on acoustic prediction
2002-03	\$440K	ONR	INSTAAR	EuroSTRATAFORM: Modeling Margin Sedimentation
2001-02	\$50K	NSF	INSTAAR	Community Sediment Model
2004-06	\$189 K	NASA	INSTAAR	Changing C & N & Water Cycles in the Earth System
2004-06	\$24K	Indiana St U	INSTAAR	Sediment production & buffering in the Waipaoa R., NZ
2005-09	\$540K	ONR	INSTAAR	Sediment dynamics of World deltas & Estuaries
2006-11	\$4.5M	NSF	CSDMS	Community Surface Dynamics Modeling System
2007-10	\$313K	NASA	CSDMS	Analysis of inland and coastal water fluxes
2007-11	\$320K	ConocoP	CSDMS	Sedimentary Environments
2008-09	\$30K	ExxonM	CSDMS	Community Surface Dynamics Modeling System
2009-11	\$150K	Statoil	CSDMS	Community Surface Dynamics Modeling System
2008-09	\$450K	CU&USGS	CSDMS	CSDMS High Performance Computing Cluster
2009-13	\$2.2M	NSF/CDI	CSDMS	Commodity governance in Earth science modeling

### Funded Research Projects as Co-I

Period	\$US	Agency	Research Site	Project Funded
1996-99	\$325K	NSF/ATM	INSTAAR	Paleoclimate of W/NW Iceland (PALE)
1996-97	\$50K	NSF/ANS	INSTAAR	Greenland Margin - Denmark Strait Paleooceanography
1998-00	\$450K	NSF	UMinn	Experimental Study of Basin Stratigraphy
1999-01	\$366K	NSF	INSTAAR	IMAGES: High Resolution Holocene Paleoclimate (Ic/Gr)
2001-05	\$2.2M	NSF	INSTAAR/CIRES	HARC: Coastal Erosion in Barrow Alaska
2008-11	\$4.0M	NSF/CU	U. Colorado	High Performance Front Range Supercomputer
2010-12	\$358K	NSF	CSDMS	River Plumes as Indicators of Greenland Ice Sheet Melt

### Ship-based Research

1974	<i>MV Martin Carlson</i>	<i>Lake Superior</i>	<i>Geochemistry</i>	1983	<i>CSS Hudson</i>	<i>Baffin Fjords</i>	<i>Chief Scientist</i>
1976	<i>MV Sea Lion</i>	<i>Fraser River</i>	<i>Sedimentology</i>	1984	<i>CSS Louis Lauzier</i>	<i>Saguenay</i>	<i>Chief Scientist</i>
1977	<i>HMAV Endeavor</i>	<i>Georgia Straight</i>	<i>Geophysics</i>	1985	<i>MV Pandora/Pisces</i>	<i>Baffin Fjords</i>	<i>Chief Scientist</i>
1976	<i>MV Active Lass</i>	<i>Howe Sound</i>	<i>Chief Scientist</i>	1986	<i>CSS Dawson</i>	<i>Gulf St. Lawrence</i>	<i>Coordinator</i>
1977	<i>MV Active Lass</i>	<i>Howe Sound</i>	<i>Chief Scientist</i>	1987	<i>CSS Dawson</i>	<i>Gulf St. Lawrence</i>	<i>Chief Scientist</i>
1979	<i>MV Pandora II</i>	<i>B.C. Fjords</i>	<i>Chief Scientist</i>	1988	<i>CSS Dawson</i>	<i>Lake Melville</i>	<i>Watch Leader</i>
1980	<i>St. Anthony/Pisces</i>	<i>B.C. Fjords</i>	<i>Chief Scientist</i>	1988	<i>Chinese Ferry Boat</i>	<i>South China Sea</i>	<i>Watch Leader</i>
1981	<i>St. Anthony/Pisces</i>	<i>B.C. Fjords</i>	<i>Sedimentology</i>	1989	<i>CSS Dawson</i>	<i>Gulf St. Lawrence</i>	<i>Chief Scientist</i>
1981	<i>MV Pandora/Pisces</i>	<i>Gulf St. Lawrence</i>	<i>Chief Scientist</i>	1989	<i>CSS Baffin</i>	<i>Lake Melville</i>	<i>Watch Leader</i>
1982	<i>CSS Dawson</i>	<i>Saguenay</i>	<i>Watch Leader</i>	1991	<i>CSS Hudson</i>	<i>Lake Melville</i>	<i>Chief Scientist</i>
1982	<i>CSS Hudson</i>	<i>Baffin Fjords</i>	<i>Senior Scientist</i>	1993	<i>CSS Hudson</i>	<i>Greenland, Iceland</i>	<i>Chief Scientist</i>

### SELECTED HONORS & AWARDS

1976-78: National Research Council, Canada, Graduate Student Fellowship, Vancouver Canada  
 1994: Keynote Speaker, Antarctic Acoustic Workshop, Siena Italy  
 1998: Keynote Speaker, International Workshop of Fjords, Tromso Norway  
 1998: Keynote Speaker at the SEPM-IAS STRATCON Workshop, Sicily Italy  
 1998: Keynote Speaker at the LOICZ Open Science Congress, Noordwijkerhout, Netherlands  
 2001: Keynote Speaker at the SEPM Diamond Jubilee, Denver USA  
 2006: Keynote Speaker at the International Sedimentological Congress, Fukuoka Japan  
 2007: Keynote Speaker at the NSF MARGINS Source to Sink Workshop, San Francisco-Eureka USA  
 2008: Keynote Speaker at the IAHS Sediment Dynamics in Changing Environments, Christchurch NZ  
 2009: Keynote Speaker at the Rivers Coastal Estuary Morphodynamics Conference, Santa Fe Argentina  
 2009: Royal Society of Canada, Huntsman Medal for Outstanding Achievements in Marine Science  
 2010: Keynote Speaker at the Storm Surges Congress, Hamburg Germany  
 2010: Keynote Speaker at the BGS Landscapes into Rock, London UK  
 2010: Fellow, American Geophysical Union  
 2011: Keynote Speaker at the Deltas Under Climate Change: Challenges of Adaptation, Ha Noi, Vietnam

### SCIENTIFIC CREATIVITY

1. Redefined paradigms of ice marginal sedimentation through a mass balance approach using geophysical data.
2. Determined the *in situ* behavior of marine suspended particles including settle velocity, size, concentration and density.
3. Developed numerical models to capture: i) Climate-driven impacts on discharge and sediment load; ii) Isostasy impacts on river delta architecture; iii) Complex transport pathway in sedimentary basins
4. Developed new concepts on biological-sediment interactions: i) Zooplankton response to the ingestion of suspended sediment; ii) large sea mammal interaction with the benthos of deep high arctic environments; iii) Corals move large boulders through current drag on their fans; iv) Benthic community response to the proximity of tidewater glaciers.
5. Monitored underwater slides and sediment gravity flows.
6. Developed complex standards and methods for the first world inter-instrument, inter-lab calibration experiment of commercial and non-commercial methods of particle size analysis.
7. Emplacement of oceanographic moorings in the arctic via helicopter.
8. New theory for the formation of arctic placer deposits as related to the concept of thermal erosion.
9. Use of particulate organic carbon to hindcast sedimentation rates and summer temperatures in arctic environments.
10. Developed method for estimating the rating coefficients related to the intra-annual variability of rivers
11. First predictions on the daily flux of sediment discharge of global rivers
12. New paradigm on delta morphology and subsidence under the influence of human activity.

## PROFESSIONAL INFLUENCE

1. Sedimentology advisor to publishers Elsevier, Springer, Cambridge U Press, Allen Press.
2. Consultant to the U.S. Office of Naval Research and NATO Naval Geoscience initiatives (Seafloor acoustics, Mine Burial & Countermeasures, Antisubmarine Warfare, Arctic Submarine Operations, Special Operations, Uncertainty)
3. ARCUS (Arctic Research Consortium of the US) Board of Directors, representing 30 US universities/institutes (1995-98)  
Secretary and Executive Committee of the ARCUS Board of Directors (1997 -98)
4. Chair-elect of the ICSU Global Environmental Change program IGBP 2011—
5. Journal Editor, Assoc. Editor, and Editorial Board of international journals.
6. Advisor to the Academies of Poland, China, Canada and the US on Global Change issues.
7. Scientific Advisory Board for the Institute of Arctic & Alpine Research, University of Colorado (1992-95).
8. Selection Panel for the Huntsman Award for Outstanding Achievements in Oceanography (1991-96).
9. Executive, Committee on Sedimentology, International Union of Geological Sciences, 1985-88
10. Advisor to U.S. Dept. of Justice with respect to marine pollution (1992-93).
11. Director, INSTAAR, University of Colorado at Boulder (1995-2007)
12. Scientific Advisory Committee and Panel Reviewer for NSF/ONR SCICEX US Nuclear Submarine Science (1996-99).
13. Scientific Advisory Committee for NSF RAISE Land-Shelf Interaction Program (1996-00).
14. Scientific Steering Committee IGBP Land Ocean Interactions in the Coastal Zone 1998– 2002
15. Scientific Steering Committee for AOSB Arctic Paleo River Discharge (1998-01).
16. Scientific Advisor to IGBP (Global Change) Water Initiative (2000-02)
17. Scientific Advisory Committee for NSF Arctic Hydrology Program CHAMPS (2002-03)
18. Scientific Advisory Committee for NSF Margins: Source to Sink Program (2001-02)

## RECOGNITION

1. International project leader or co-leader:
  - SAFE: 4 countries (Canada, US, UK, Netherlands); 35 scientists, 1981-88
  - IUGS Size Characterization: 12 countries; 32 scientists, 1984-90
  - ADFEX: 5 countries (Can., Norway, France, UK, Poland); 22 scientists, 1986-2002
  - INQUA's COLDSEIS, 15 countries, 48 scientists 1990-96
  - SEDFLUX: 6 countries (Canada, US, Iceland, China, Denmark, Germany); 40 scientists
  - ODP/CCDP Global Change Drilling: 4 countries (Canada, US, UK, Norway), 19 scientists
  - ONR STRATAFORM (US, Canada): 35 PIs and 45 Co-Is, 1994-2002
  - EC & ONR EuroSTRATAFORM (US, Canada, Europe); 100 PIs, 2002-2008
  - SCOR/LOICZ Sediment Retention in Estuaries Initiative, 2006-10
  - GWSP/LOICZ/CSDMS Deltas at Risk Initiative, 2007-10
  - CSDMS (30+ countries): 500+ members, 230 institutions, 2001—
2. Panel Expert — International Geosphere/Biosphere Program (IGBP: Global Change):
  - US-Canada agreement on Arctic Interactions (foundation of NSF-ARCSYS)
  - Royal Society of Canada IGBP Arctic Working Group; Paleoclimate Working Group
  - Science Steering Committee IGBP/LOICZ

## PROGRAM PLANNING

Arctic Global Change Workshop, UCAR, Boulder CO, 1987  
ARCUS: Arctic Research Consortium of the US, Seattle, WA 1995; Washington, DC, 1996  
Circum-Arctic Paleo Environments (CAPE), Copenhagen, DK, 1995  
GWSP: Dams and Reservoirs: Planning meeting at U. New Hampshire, 2007  
IGOS-WCRP Water Theme Meeting, National Academy of Sciences, Irvine CA, 2001  
LOICZ SSC: Netherlands, 1997; Tokyo, 1998, Amsterdam, 1999, Arcachon, Fr, 2000, Bahia Blanca, Arg, 2001, Miami, FL, 2002, Banff, Can, 2003, Singapore 2004, Netherlands, 2005  
LOICZ/GWSP Deltas at Risk: U. New Hampshire 2006; U. Colorado Boulder, 2007  
LOICZ/GWSP Executive Planning Meeting for Phase Two cooperation, Yale, New Haven, CN, 2006  
MOBIL SRC Strategic Meeting, Dallas TX, 1997  
NOAA, NASA, ESA, IGBP, IHDP, WCRP: International Global Observing System for Hydrology, Orange County, 2001  
NSF Community Surface Dynamics Modeling Workshop, Boulder CO, 2002, Arlington, 2003, Minneapolis, 2004, Berkley 2007, Orlando, 2008, Boulder 2008 San Antonio 2008, San Francisco 2008  
NSF Cyberinformatics in Geosciences, Federal Center, Denver, 2007  
NSF Geology/Paleontology Futures Workshop, Boulder, CO, 1999  
NSF High Performance Computing Collaboratory in Geosciences, Boulder CO, 2006  
NSF MARGINS: Source to Sink Workshop, Quinalt WA, 2000, Lake Tahoe NV, 2001, Arlington, 2002, San Francisco,

2007, Orlando, 2008; Gisborne NZ 2009  
 NSF Siliciclastics Workshop, Upper Brandon, VA, 1996  
 NSF-ONR Data Management for Marine Geology and Geophysics, San Diego, 2001  
 NSF: Community Sediment Model for Carbonate Systems, 2008, Golden CO  
 NSF: Cyber-Informatics in Earth Systems, DC 2006, Denver, CO 2007, Boulder CO, 2008  
 NSF: Impacts of Arctic bathymetry and fresh water inputs on shelf and ocean circulation, Monterey, CA 1999  
 NSF: Ocean Drilling Program: COMPLEX, Vancouver, BC, 1999; ODP and Industry, Houston, TX, 1999  
 NSF: Studying Earth Surface Processes with HR Topographic Data, Boulder CO, 2008  
 NSF: Margins Successor Planning Meeting, San Antonio, TX, 2010  
 NSF: Critical Zone Observatories Meeting, Arlington, VA, 2010  
 ONR Arctic Workshop, Arlington VI, 1984; Woods Hole MA, 1988  
 ONR Continental Terrace Workshop Stony Brook, NY, 1993  
 ONR DRI: Environmental Complexity for the operational Navy, Arlie, VA, 2000; APL-Seattle: 2001; ARL-Penn, 2001;  
 UNH-CCOM-2002; Scripps -2002, Arlington-2004;  
 ONR DRI: Tidal Flats: Ansan Korea, 2006; Honolulu HI, 2007; Incheon Korea, 2007  
 ONR EUROSTRATAFORM, Arlington VA, 1999, 2000; Paris Fr, 1999; Bologna It, 2000; San Francisco CA, 2000; PASTA  
 & PREMISE: 2001, Arlington; EuroDelta & EuroSTRATAFORM: 2002 Bologna, It, Winchester, UK, 2002, Aix, Fr,  
 2003, Keystone CO, 2004; Salamanca, 2005; Charlottesville, 2006  
 ONR Geoclutter Workshop, Arlington, VA, 1999, 2000, 2002; San Francisco 2000; Boulder 2001, 2002;  
 ONR High Frequency Acoustics Workshop, Golden, CO, 1996  
 ONR Mine Burial Workshop, Stennis Space Center, MI, 2000; St. Petersburg, 2001; San Diego, 2002, Phoenix, 2002;  
 ONR STRATAFORM Workshop, Eureka, CA, 1995; Modelers Workshops, San Francisco, Boulder, Minneapolis, Dallas,  
 Durham, Arlington; 1995-2002; Plume Workshop, Arlington, VA, 1996; Shelf Transport Workshop, Woods Hole,  
 MA, 1996  
 ONR Submarine Sediment Failure Workshop, College Station TX, 1991  
 ONR Submarine Slope Workshop, Arlington, VA, 1994  
 ONR Taiwan Coastal Sediment Transport Study, Taipei, 2008  
 SCOR-LOICZ Sediment Retention in Estuaries WG: Faro, Portugal, 2004, Texel, Netherlands, 2005, Boulder 2007  
 NSF PRISM Processes at Rifting and Subducting Margins, San Antonio TX 2010  
 ONR-Vietnamese Workshop on Oceanography of the Vietnamese East Sea, Ha Noi, Vietnam, 2010

### **PRESENTATIONS & ADDRESSES Symposia, Congresses, Conferences, Workshops**

**AAPG/SEPM Conference**, Calgary 1997; Denver 2001; Houston 2006; Orange County 2007; San Antonio 2008; Denver  
 2009, New Orleans 2010  
**AGU Chapman Conference**, Puerto Rico, 2001; Oxnard, 2011  
**American Geophysical Union Fall meeting**: San Francisco, 1995-2010  
 American Geophysical Union Spring meeting, New Orleans, 2005  
 AGU Western Pacific Geophysics Meeting, Taipei, Taiwan, 2010  
**Annual Arctic Workshop**: 13th Boulder CO, 1983; 14th Dartmouth NS, 1985; 15th, Boulder CO, 1986; 19th, Boulder CO,  
 1989; 22nd, Boulder CO, 1992; 23rd, Columbus, OH, 1993; 25th, Quebec City, QU, 1995; 26th, Boulder, CO, 1996;  
 28<sup>th</sup>, Boulder CO, 1998; 29<sup>th</sup> Seattle, WA, 1999; 30<sup>th</sup> Boulder, CO, 2000, 32<sup>nd</sup> Boulder, CO, 2000, 33<sup>rd</sup> Tromso,  
 Norway, 2003, 34<sup>th</sup> Boulder CO, 2004, 2006  
 Antarctic Offshore Acoustic Stratigraphy Symposium, Siena Italy, 1994  
 Canadian Geotech. Workshop on Offshore In Situ Techniques, Quebec QU, 1990  
 Canadian Hydrology Symposia - 1990, Burlington ON,  
 Canadian Quaternary Association: Coastal Glaciomarine Environments, Fredricton NB, 1991  
 Canadian Workshop of Ocean Drilling Program, Waterloo ON, 1989  
 Canyons Workshop –European Commission: Sitges, Spain 2002  
 COLDSEIS Workshop, Halifax, Canada, 1995  
 Congress Assoc. of Canadian Francophone Academics, Chicoutimi QU, 1985  
 ExxonMobil, Huston TX, Margins Source to Sink Short Course, 2002  
**Geological Association of Canada**: Halifax NS, 1980; Victoria BC, 1983; Toronto ON, 1991; Wolfville NS, 1992;  
 Edmonton, AL, 1993; Victoria, BC, 1995  
**Geological Society London**: 1) Deltas, London UK, 1986; 2) Glaciomarine Processes, London UK, 1988; 3) Glacier-  
 influenced Sedimentation, Bristol UK, 2001; 4) Landscapes into Rock, 2010  
**Geological Society of America**: Denver, 1996; Philadelphia, 2006  
 George H.W. Bush 3<sup>rd</sup> China-US Relations: Energy, Security, Environment, DC, 2007,  
 IAHS Sediment Dynamics in Changing Environments, Christchurch, New Zealand, 2008  
**Int'l Assoc. of Mathematical Geosciences**: 3<sup>rd</sup> Barcelona Spain, 1997; 7<sup>th</sup> Cancun Mexico, 2001; 8<sup>th</sup> Berlin Germany, 2002;

15<sup>th</sup> Stanford U, California, 2009.  
 International Conf. Abrupt Climate Change in Clastic Sedimentary Environments, Stockholm, Sweden, 1998  
 International Conference on Arctic Research Planning, Hanover, NH, 1996  
 International Congress of Quaternary Research, Ottawa ON, 1987  
**International Geological Congress:** 28<sup>th</sup> Washington DC, 1989, 29<sup>th</sup> Kyoto, Japan, 1992, 32<sup>nd</sup> Florence, Italy 2004  
**International Sedimentological Congress:** 11<sup>th</sup> Hamilton ON, 1982, 13<sup>th</sup> Nottingham UK, 1990; 17<sup>th</sup> Fukuoka, Japan, 2006, 18<sup>th</sup> Mendoza, Argentina, 2010  
 International Workshop on Sedimentary Processes and Paleoenvironments in Fjords, Tromso, Norway, 1998.  
**IUGS-COS Particle Characterization:** Dartmouth NS, 1986; Heidelberg Germany, 1987  
**Land-Ocean Interaction in the Coastal Zone (LOICZ)** Noordwijkerhout, Netherlands, 1998; Bahia Blanca, Argentina; 1999; Shonan, Japan, 2000; Archachon, France, 2000; Amsterdam, 2001; Miami 2002  
 Modeling Turbidity Currents and Related Gravity Flows, Santa Barbara, 2009  
 Numerical Experiments in Stratigraphy, Lawrence, KS, 1996  
**Ocean Sciences Meeting (AGU/ASLO/TOS):** San Diego, 1996; Honolulu, 2006, Orlando, 2008  
 ONR Microstructure Workshop - Stennis Space Centre, Slidell LA, 1988  
**ONR STRATAFORM Modelers Workshops:** Boulder, CO, 1996; Minneapolis, MN, 1997; Dallas, TX, 1998; Durham, NC, 2000; Arlington, 2001  
**ONR STRATAFORM Slope Workshops:** Arlington, VA, 1995; Monterey, CA, 1997; Boulder, CO, 1999  
**ONR STRATAFORM:** San Diego, CA, 1996; San Francisco, CA, 1997; Keystone, CO, 1998; Monterey, CA, 1999  
 Paleooceanography of the North Atlantic Margin, Edinburgh UK, 1995  
 Pierre Beghin Gravity Flow Workshop, Grenoble, France, 1993  
 PONAM Workshop, Cambridge UK, 1993.  
 Quantitative Dynamic Stratigraphy Workshop, Golden CO, 1988  
 Quatrimies Entretiens Jacques Cartier re: Hazards, Lyon/Grenoble FRA, 1990  
 Québec Quaternary Association Workshop, Rimouski QU, 1988  
 SEPM Fine-grained Sediment Research Workshop, San Jose CA, 1984  
 SEPM-IAS STRATCON 98, Sicily, 1998  
 TEXACO workshop on Dynamic Geological Modeling, Houston TX, 1991

### INVITED LECTURES Universities, Institutes, Learned Societies, Academies

ARCO, Plano, TX	McGill University, Canada
Cambridge University, UK	MOBIL Technology Center, Dallas
Chinese Geological Academy, Beijing, China	Mount Sinai Medical Center, New York, USA
City College, CUNY, New York	Naval Oceanographic Office, Stennis Space Center
Colorado School of Mines, Golden USA	Oceans University of China, Qingdao, China
Columbia University, USA	Polish Geological Academy, Krakow, Poland
Dalhousie University, Canada	SAGA Petroleum, Oslo, Norway
Delft University of Technology, Netherlands	Scipps Oceanographic Institute, La Jolla CA
Desert Research Institute, Reno, USA	Simon Fraser, University, Canada
Duke University, Durham, NC, USA	St. Mary's University, Canada
ExxonMobil Technology, Huston, TX	Taiwan National University, Taipei
Geological Nuclear Science, Wellington, NZ	TEXACO Technology, Dallas
Geological Society of America, Houston, TX	University of Alberta, Canada
Geological Society, Edinburgh, UK	University of Barcelona, Spain
Geological Survey of Canada Branches: Vancouver, Ottawa, Dartmouth, Calgary, Victoria	University of Bellingham, USA
Institute of Arctic and Alpine Research, Boulder, USA	University of Bergen, Norway
Institute Of Hydroengineering, Gdansk, Poland	University of Bergen, Norway
Institute of Marine Geology (CNR)- Bologna	University of British Columbia, Canada
Institute of Ocean Sciences, Patricia Bay, Canada	University of Calgary, Canada
Institute of Ocean Sciences, Wormley, UK	University of Chicago, IL
Kangwon National University, Chuncheon, Korea	University of East Anglia, UK
Korean Ocean Research Development Institute, Assan	University of Glasgow, UK
Korean Polar Research Institute, Incheon	University of Heidelberg, Germany
Lakehead University, Canada	University of Illinois at Chicago
Lamont-Doherty Geological Observatory, USA	University of Milwaukee, USA
Laval University, Canada	University of Nebraska, Lincoln, USA
Macquarie University, Sydney, Australia,	University of New Hampshire, Durham
	University of Northern Illinois, Dekalb, USA

University of Oslo, Norway  
 University of Québec at Montreal, Canada  
 University of Québec at Rimouski, Canada  
 University of Stockholm, Sweden  
 University of Texas, Austin, USA  
 University of Toronto, Canada  
 University of Tromsø, Norway  
 University of Virginia, Charlottesville, USA

University of Wyoming, Laramie, USA  
 Woods Hole Oceanographic Institute, USA  
 Yale, New Haven, USA

<b>PUBLICATION STATISTICS (Feb 14, 2011)</b>	
ISI Peer-reviewed Journal Publications	127
Peer-reviewed Books and Book Chapters	57
Editor of Peer-reviewed Special Issues	9
Reviews & Communications in Peer-Reviewed Journals	14
Peer-reviewed Conference Proceedings, Newsletters & Reports	43
Manuscripts in preparation or review or in press	11
Peer-reviewed Government Reports	56
Unpublished & Limited-Distribution Manuscripts	9
Published Conference Abstracts	<u>234</u>
<b>TOTAL</b>	<b>557</b>

### Key Publications by Career Research Topics

Statistics for ISI Citations are as of Feb 1 2011: ISI Web of Knowledge journal citations — 4,286 with an h-index of 34; ISI citations including books & book chapters & reports — 5,201 ISI citations with an h-index of 39. **Only citation hits  $\geq 25$  are highlighted below.** Papers are also listed chronologically, by publication category, further down in the CV. This section is a commentary on significant contributions by research category.

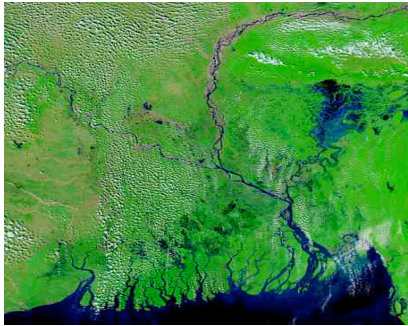
### FJORD RESEARCH



My first love in environmental research was to explore the dynamics of fjords: biology, hydrology, physical oceanography, biogeochemistry, glaciology, sedimentology and stratigraphy. Fjords are giant experimental systems from which fundamental theorems can be developed. My fjord research began in 1975, at the University of British Columbia with my Doctoral studies. Fundamentals of river plumes, turbidity currents, sediment failure, flocculation dynamics, carbon sequestration, ice age processes were advanced (see other sections as well). The scholarly text (1) was well received (e.g. “*simply outstanding in breadth and depth*” Science, 1988). In 1998 in Tromsø Norway, at an international conference on fjords, I provided the keynote address, reflecting on 25 years of fjord research.

1. Syvitski, J.P.M., Burrell, D.C. & Skei, J.M. 1987 *Fjords: Processes & Products*. Springer-Verlag, N.Y. 379 pp. **Citations: 225**
2. Syvitski, J.P.M. 1989. On the deposition of sediment within glacier-influenced fjords: Oceanographic controls. *Marine Geology* 85: 301-329. **Citations: 99**
3. Syvitski, J.P.M. and Farrow, G.E. 1989. Fjord sedimentation as an analogue for small hydrocarbon-bearing submarine fans. In: M.K.G. Whateley & K.T. Pickering (eds.) *Deltas: Sites and Traps for Fossil Fuels*. Geological Society of London Special Publication No. 41: 21-43. **Citations: 42**
4. Syvitski, J.P.M., Andrews, J.T., and Dowdeswell, J.A. 1996. Sediment deposition in an iceberg-dominated glacial marine environment, East Greenland: basin fill implications. *Global and Planetary Change* 12: 251-270. **Citations: 62**
5. Syvitski, J.P.M. and Schafer, C.T. 1996. Evidence for an earthquake-triggered basin collapse in Saguenay Fjord, Canada. *Sedimentary Geology*, 104: 127-153. **Citations: 50**
6. Syvitski, J.P.M. and Shaw, J. 1995. Sedimentology and Geomorphology of Fjords. Edited by G.M.E. Perillo, *Geomorphology and Sedimentology of Estuaries*, Elsevier Publ., 113-178 pp.
7. Syvitski, J.P.M. and Hein, F.J. 1991. Sedimentology of an arctic basin: Itirbilung Fiord, Baffin Island, Canada. *Geological Survey of Canada Professional Paper* 91-11, 67 pp. **Citations: 29**
8. Syvitski, J.P.M., LeBlanc, K.W.G. and Cranston, R.E. 1990. The flux and preservation of organic carbon in Baffin Island fjords. In: J.A. Dowdeswell and J.D. Scourse (eds.) *Glaciomarine Environments: Processes and Sediments*. Geological Society, London, Spec. Publ. 53: 217-239. **Citations: 41**

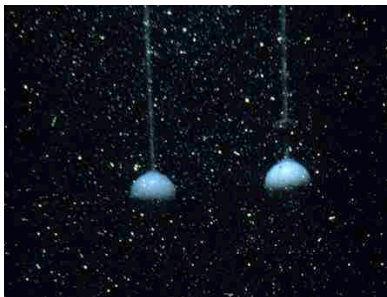
9. Andrews, J.T. and Syvitski, J.P.M. 1994. Sediment fluxes along high latitude glaciated continental margins: Northeast Canada and Eastern Greenland. In: W. Hay (ed.) *Global Sedimentary Geofluxes*. National Academy of Sciences Press, Washington, Ch. 7: p. 99-115.
10. Overeem, I., Syvitski, J.P.M., 2010, Experimental exploration of the stratigraphy of fjords fed by glacio-fluvial systems, Howe, J. A., Austin, W. E. N., Forwick, M. & Paetzel, M. (eds) *Fjord Systems and Archives*. Geological Society, London, Special Publications, 344, 127–144.



### SEDIMENT DELIVERY BY RIVERS

A fundamental problem in biogeochemistry is to predict the sediment delivery by World Rivers since so few are monitored. Twenty-five highly cited papers, review papers, and special journal issues. A paper with John Milliman (2) led to insight that the long-term fluvial fluxes could be predicted. With other colleagues, more advanced methods were developed for predicting fluxes across shorter (dynamic) time scales and subsequently applied to ice-age, global warming scenarios, and the impact of humans.

1. Syvitski, J.P.M., Peckham, S.D., Hilberman, R.D., and Mulder, T. 2003. Predicting the terrestrial flux of sediment to the global ocean: A planetary perspective. *Sedimentary Geology* 162: 5-24. Citations: 71
2. Milliman, J.D. and Syvitski, J.P.M. 1992. Geomorphic/tectonic control of sediment discharge to the ocean: The importance of small mountainous rivers. *Journal of Geology* 100: 525-544. Citations: 914
3. Mulder, T. and Syvitski J.P.M. 1996. Climatic and morphologic relationships of rivers. Implications of sea level fluctuations on river loads. *Journal of Geology* 104: 509-523. Citations: 59
4. Syvitski, J.P. and Morehead, M.D., 1999. Estimating river-sediment discharge to the ocean: application to the Eel Margin, northern California. *Marine Geology* 154: 13-28. Citations: 100
5. Syvitski, J.P.M., Morehead, M.D., Bahr, D., and Mulder, T., 2000. Estimating fluvial sediment transport: the Rating Parameters. *Water Resource Research* 36: 2747-2760. Citations: 60
6. Morehead, M.D., Syvitski, J.P.M., Hutton, E.W.H., and Peckham, S.D. 2003. Modeling temporal variability in the flux of sediment in ungauged river basins. *Global and Planetary Change* 39: 95-110. Citations: 42
7. Meybeck, M., Laroche, L., Darr, H.H. and Syvitski, J.P.M., 2003, Global variability of total suspended solids and their fluxes in rivers. *Global and Planetary Change* 39 (1/2): 65-93. Citations: 56
8. Syvitski, J.P.M., 2003. Supply and flux of sediment along hydrological pathways: Research for the 21<sup>st</sup> Century. *Global and Planetary Change* 39 (1/2): 1-11. Citations: 54
9. Kettner, A.J., Restrepo, J.D., Syvitski, J.P.M., 2010, A spatial simulation of fluvial sediment fluxes within an Andean drainage basin, the Magdalena River, Colombia. *J Geology* 118: 363-379.



### SUSPENDED PARTICLE DYNAMICS

From early graduate times, I have worked to understand how river-borne particles clump together once they reach the marine environment. The work led to advanced understanding of sedimentation beneath river plumes through the complexities of flocculation. Later, by determining the *in situ* behavior of marine suspended particles using underwater photography, settle velocity, floc size, floc concentration and density of flocs could be measured leading to new theories on marine sedimentation.

1. Syvitski, J.P.M. and Murray, J.W. 1981. Particle interaction in fjord-suspended sediment. *Marine Geology* 39: 215-242. Citations: 71
2. Syvitski, J.P.M., Asprey, K.W., Clattenburg, D.A. and Hodge, G.D. 1985. The prodelta environment of a fjord: suspended particle dynamics. *Sedimentology* 32: 40-65. Citations: 49
3. Syvitski, J.P.M. 1991. The changing microfabric of suspended particulate matter - the fluvial to marine transition: flocculation, agglomeration and pelletization. In: R.H. Bennett, W.R. Bryant and M.H. Hulbert (eds.) *The Microstructure of Fine-grained Sediment - from Muds to Shale*. Frontiers in Sedimentary Geology, Springer-Verlag, New York: 131-137.
4. Syvitski, J.P.M., and Lewis, A.G. 1992. The seasonal distribution of suspended particles, and their iron and manganese loading, in a glacial runoff fjord. *Geoscience Canada* 19(1): 13-20.
5. Domack, E.W., Foss, D.J.P., Syvitski, J.P.M., and McClennen, C.E. 1994. Transport of suspended particulate matter in

- an Antarctic fjord. *Marine Geology* 121: 161-170. Citations: 29
6. Syvitski, J.P.M. and Hutton, E.W.H. 1996. *In situ* characteristics of suspended particles as determined by the Floc Camera Assembly FCA. *Journal of Sea Research* 36: 1-12.
  7. Syvitski, J.P.M., Asprey, K.W. and LeBlanc, K.W.G. 1995. In-situ characteristics of particles settling within a deep-water estuary. *Deep-Sea Research II* 42(1): 223-256. Citations: 60
  8. Syvitski, J.P.M. and Hutton, E.W.H., 1997. FLOC: Image analysis of marine suspended particles. *Computers and Geoscience* 23(9): 967-974.
  9. Hill, P.; J P Syvitski, R D Powell, E A Cowan. 1998. In situ observations of floc settling velocities in Glacier Bay, Alaska. *Marine Geology* 145 (1-2): p. 85-94. Citations: 58
  10. Azetsu-Scott, K., and Syvitski, J.P.M. 1999. How melting icebergs influence particle distribution in the water column. *J Geophysical Research* 104: 5321-5328.
  11. Curran, K.J., Hill, P.S., Milligan, T.G., Cowan, E.A., Syvitski, J.P.M., and Konings, S.M. 2004. Fine-grained sediment packaging below the Hubbard Glacier meltwater plume, Disenchantment Bay, Alaska. *Marine Geology* 203: 83-94.



### DELTA and PRODELTA

I grew up living on a delta. This early appreciation led to insights on how deltas evolve from both autocyclic responses and allocyclic forces. River plume behavior plays an important role in sediment dispersal. The number, dimensions and shapes of distributary channels have been strongly biased by the impact of humans, leading to a redefining of the ternary diagram of waves, tides, and river power that earlier textbooks had as their paradigm for understanding the morphodynamics of deltas.

1. Syvitski, J.P.M. and Farrow, G.E. 1983. Structures and processes in bayhead deltas: Knight and Bute Inlet, British Columbia. *Sedimentary Geology*, 36: 217-244.

Citations: 37

2. Syvitski, J.P.M., Smith, J.N., Boudreau, B. and Calabrese, E.A. 1988. Basin sedimentation and the growth of prograding deltas. *J. Geophysical Research*, 93: 6895-6908. Citations: 57
3. Morehead, M.D., and Syvitski, J.P., 1999. River Plume Sedimentation Modeling for Sequence Stratigraphy: Application to the Eel Shelf, California. *Marine Geology* 154:29-41. Citations: 34
4. Overeem, I., Syvitski, J.P.M., and Hutton, E.W.H., 2005. Three-dimensional numerical modeling of deltas. In: L. Giosan and J.P. Bhattacharya (Eds.) *River Deltas — Concepts, Models, and Examples*. SEPM Special Publication No. 83, pp. 13-30.
5. Syvitski, J.P.M., Kettner, A.J., Correggiari, A., Nelson, B.W. 2005, Distributary channels and their impact on sediment dispersal. *Marine Geology* 222-223: 75-94. Citations: 28
6. Syvitski, J.P.M., Saito, Y. 2007, Morphodynamics of Deltas under the Influence of Humans. *Global and Planetary Changes*. 57: 261-182. Citations: 29



### GLACIAL SEDIMENTATION and STRATIGRAPHY

The largest body of literature I have written (i.e. > 60 papers, books, maps) is on the imprint of former ice sheets as they advanced and retreated across world continental margins. The body of work redefined paradigms of ice marginal sedimentation through a mass balance approach using very-high resolution geophysical data. Community response for this effort was an acoustic atlas edited by Davies, T.W. et al., (Chapman & Hall, London) dedicated to me. The 82 pg review (Ballantyne, C. 2002, QSR) states: “no other aspect of

paraglacial geomorphology has advanced so far, so fast or so fruitfully, largely through the compelling advocacy of D.L. Forbes, J.P.M. Syvitski and their research collaborators.”

1. Syvitski, J.P.M. and Praeg, D.B. 1989. Quaternary sedimentation in the St. Lawrence Estuary and adjoining areas. An overview based on high-resolution seismo-stratigraphy. *Géographie physique et Quaternaire* 43(3): 291-310. Citations: 64
2. Syvitski, J.P.M. 1991. Towards an understanding of sediment deposition on glaciated continental shelves: sequence stratigraphy. *Continental Shelf Research* 11: 897-937. Citations: 38
3. Syvitski, J.P.M. 1993. Glacimarine environments in Canada: An overview. *Canadian Journal of Earth Sciences* 30:

- 354-371. Citations: 25
4. Williams KM, Short SK, Andrews JT, Syvitski, JPM, 1995. The eastern Canadian arctic at ca.6 ka BP - a time of transition. *Géographie physique et Quaternaire* 49(1): 13-27. Citations: 26
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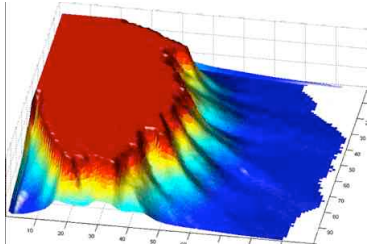


## GLOBAL ENVIRONMENTAL CHANGE

I first took up the challenge in thinking globally by putting fjord research into a global perspective. I became involved global environmental change science during the birth of the International Geosphere Biosphere Programme; activities continued through other international programs including the Land Ocean Interaction in the Coastal Zone, and the Global Water System Project. This led to writing a variety of papers that involved the impact of humans on the global environment. Recent studies on delta subsidence and changes in the relative sea levels of deltas have pointed to the negative impact of upstream damming and subsurface mining for water, oil and gas.

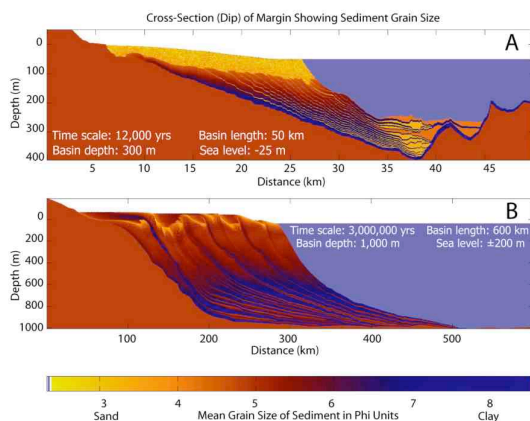
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## SIMULATION OF SEDIMENT TRANSPORT AND STRATIGRAPHY



I have combined my understanding of transport physics with numerical skills to develop a suite of computer models to: (i) predict discharge and sediment flux from rivers, (ii) investigate the impact of climate on river deltas, and (iii) show how multiple transport pathway affect the long term fill of sedimentary basins. The models have been applied by the U.S. Navy and by environmental and energy companies. This effort forms my second largest body of literature (>50 papers and books). The Millennium Review by Paola (Sedimentology, 2000) noted that these models “would be to sedimentary geology what global climate models are to atmospheric science”.

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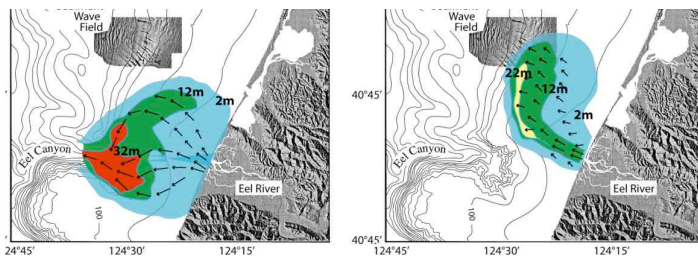


## CONTINENTAL MARGIN SEDIMENTATION

Andrew Miall in his 1995 review “Whither Stratigraphy” (Sedimentary Geology) states that three revolutions in sedimentary geology have taken place: (i) plate tectonics, (ii) process-response sedimentary models, and (iii) sequence stratigraphy. Application of my models have been used to understand the formation of continental margins, sediment dispersal patterns on continental slopes, how rare events combine with ambient processes, and to calibrate sea level curves. By characterizing global data on margin morphology with experimental data, new understandings on defining processes have been established.

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## HYPERPYCNAL FLOWS

Work that I have done with former post-doc Thierry Mulder, Jasim Imran and others has revolutionized our understanding of how rivers discharging to the ocean may generate currents that can transport sediment long distances into the ocean, bypassing the continental shelf environment.

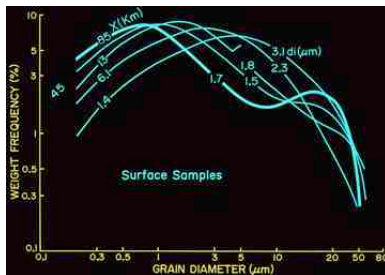
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## SEDIMENT-ANIMAL INTERACTIONS

I am fascinated on the interactions between biology and geology. This interest has led to research on the impact and response of zooplankton to the ingestion of suspended sediment, how large sea mammals resuspend seafloor sediment in deep arctic environments, the role corals play in moving large boulders through their current drag, and how benthos adapt to turbid river mouths and tidewater glaciers.

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## GRAIN SIZE ANALYSIS

While not glamorous, developmental work for the International Union of Geological Sciences, led to the standardization of analytical techniques in sediment laboratories. This effort was built on my experience in running arguably the largest and most advanced sediment lab in the world while working for the Geological Survey of Canada. The work below is a subset of that effort. "The [Syvitski] book provides fundamental and detailed practical information to any scientist, who wants to apply sediment particle characterization ... we now have a comprehensive and balanced synthesis of this broad theme" Earth Science Reviews. The book is now in its 3<sup>rd</sup> edition (2007).

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Petrobras – Rorigues  
USGS Menlo - Lee

Norwegian Geotechnical Institute - Norem, Karlsrud  
Laval -Locat, Konrad  
U Calgary -Hein  
INRS-Océanologie - Long  
Polish Inst. Hydroengineering - Sawicki  
UAlberta -Robertson

### SAFE

UAlberta -Hein, Longstaffe, Sego, Reasoner,  
Laval -Locat, Masson  
Canadian Hydrography -Rodgers, Lamplugh  
Royal Roads Military College-Mothersill, Tabrez  
QueensU-Gilbert, Dale, Aitken, McKenna-Neuman, Horvath  
UGlasgow-Farrow  
Simon FraserU-Albright, Stroh  
UNetherlands -van der Meer, Cameraat  
C-CORE - Emory-Moore

Environment Canada, NHRI  
MUN -Hay, Foley, Colbourne, Gardner, Macko, Pulchan, Ivy  
INSTAAR-Stravers, Andrews, Jennings, Osterman, Williams, Short  
UEast Anglia- Boulton  
US. ONR -Kravitz  
DFO-Smith, Ellis, Trites, Petrie  
Scottish Biol. Station - Atkinson, Moore

### **SEDFLUX**

McGill -D'Anglejan  
UQAM -Occhiatti,  
Dalhousie -Gibling  
Environment Canada CCIW -Hamblin, Coakley  
UCalgary -Hein,  
INSTAAR - Andrews  
GSC-PGC - Luternauer  
QueensU - Gilbert  
WHOI - Milliman

UQAR -Hill  
NIU -Stravers, Powell  
MUN -Hay, Aksu  
Water survey of Canada - Day  
ULaval - Chagnon, Locat, Frenette  
INRS-Océanologie - Long  
GSC -TS - Dredge  
COGLA - Hale

### **CANAM-PONAM**

Geomar - Meinert  
Danish Geological Survey -Larsen  
Scott Polar Research Institute - Dowdeswell  
W&M VIMS -Milliman  
UOslo -Elverhoi

British Geological Survey -Stoker,  
Icelandic Marine Institute - Thors  
Norwegian Polar Institute - Solheim  
INSTAAR -Andrews, Jennings, Williams

### **COLDSEIS**

U. Bergen - Aarseth  
Rice U - Anderson  
RutgersU - Ashley  
USGS - Barnes, Carlson, Cooper, Hampton, Molnia  
Norsk Hydro - Nyland Berg  
U Edinburgh - Boulton, Praeg  
Hamilton College - Domack  
U Oslo Elverhoi  
Norsk Polar Institute - Forsberg, Solheim  
QueensU - Gilbert  
BGS - Holmes, Stoker, Wingfield  
University of Wales - Kidd  
British Antarctic Survey - Larter  
UNew Brunswick - Mayer  
Uillinois at Chicago Circle - Philips, Smith  
Hi-Res Geoservice - Stewart  
UAberystwyth- Whittington

Penn. State - Alley  
INSTAAR - Andrews, Jennings  
UTexas at Austin - Austin, Davies, Lagoe  
Victoria U Wellington - Barrett, Henrys  
UTromso - Vorren  
Moscow State University - Danilov  
Scott Polar Research Institute - Dowdeswell  
Byrd Polar Research Centre - Forman  
UToronto - Gipp  
Liverpool Polytechnic - Hambrey  
ONR - Kravitz  
Geological Survey of Denmark - Larsen  
UConnecticut - Lewis  
GEOMAR - Meinert  
Northern Illinois U - Stravers, Powell  
Marine Research Institute, Iceland - Thors

### **Reservoir (HydroCarbon) MODELING**

Marathon Oil - Ross, Watts  
Texaco Oil - Matthews, Perlmuetter;  
Mobil Oil - Sarg, Gouvies, Deutsch, Cullick  
ExxonMobil - Jones, Gosslin, Sarg, Patterson, Sun  
ConocoPhillips - John Suter, Michael Hoffmann, Ron Boyd,

## **STRATAFORM**

Nittrouer, Parsons  
Friedricks, Wright  
Fulthorpe, Goth, Austin  
Orange  
Drake  
Swift  
Borgeld  
Locat  
Garcia  
Milligan  
Hill  
Wiberg

U. Washington  
VIMS, William & Mary  
U. Texas  
U. California-Santa Cruz  
Consultant  
Old Dominion U.  
Humboldt U.  
Laval U.  
U. Illinois-Urbana Champagne  
Bedford Inst. of Oceanography  
Dalhousie  
U. Virginia

Niederoda, Reed  
Alexander  
Summerfield  
Cacchione  
Prior  
Lee, Gardner, Field  
Irish, Lynch, Driscoll, Traykovski, Geyer  
Mayer  
Steckler, Mountain  
Parker  
Pratson  
Flood  
URScorp.com  
Skiddaway  
U. Delaware  
Woods Hole Research Group  
Texas A&M  
USGS-Menlo Park  
WHOI  
U. New Hampshire  
Lamont-Doherty EO  
U. Minnesota  
Duke University  
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## **CSDMS**

See [http://csdms.colorado.edu/wiki/Working\\_groups](http://csdms.colorado.edu/wiki/Working_groups)