#### **CURRICULUM VITAE: JAMES P.M. SYVITSKI**

## Last update Dec 2008



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

**Address:** *Work* INSTAAR, University of Colorado-Boulder

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Voice: 1-303-735-5482; Fax: 1-303-735-8180

Email: james.syvitski@colorado.edu

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, Simulation of Sediment Transport & Stratigraphy, Continental Margin Sedimentation, Gravity Flows, Animal-Sediment Interactions,

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

## Summary

- Expertise in earth system science, reflecting an education in the fields of quantitative Oceanography and Geoscience with double bachelors and double doctorate degrees.
- Employment history in industry, academia, government, and as an environmental consultant, working to balance applied and pure research, and economic potential given environmental concerns, having demonstrated the multi-layered meaning of "the public good".
- Forefront of Computational Geosciences: Sediment transport, land-ocean interactions and landscape evolution, including high performance computing.
- Flexible in problem solving, relying less on established paradigms, resulting in a well-cited (>3300) publication record. Co-authors come from industry, government, and academia and from many countries.
- Experienced scientific editor (journals, books) and history with international publishing houses.
- Both a player and leader of large international scientific teams.
- Supported efforts of world scientific bodies (IUGS, IGBP, INQUA, LOICZ, IAS, GWSP).
- Provided advice to Canadian, Polish, Chinese and US scientific academies on issues related to the environment and global change.
- Provided confidential advice to the Canadian Government, and US Departments of Justice, Commerce, Interior and Defense. I respect their security arrangements.
- Supervisor of undergraduate and graduate students, post-graduate fellows, laboratory and field technicians, research faculty, teaching faculty, finance and clerical staff.
- As Head, Sediment Dynamics (GSC Atlantic), coordinated a staff of 20 engaged in environmental marine problems: tidal power, iceberg scouring, cable routing, and slope stability.
- As Director of CU's INSTAAR, 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, CSDMS, coordinate 250 scientists in an international effort to develop, support, and disseminate to the earth-science research and teaching community integrated software modules that are aimed at predicting the erosion, transport, and deposition of sediment and solutes in landscapes and their repository sedimentary basins.
- 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**

# **Degrees:**

B.Sc. Lakehead University 1974 Geology; minor Mathematics

H.B.Sc. Lakehead University 1975 Geochemistry

Ph. D. U. British Columbia 1978 Geological Sciences & in Oceanography

## **University Courses Taken:**

General	Geology	Mathematics	Sed Strat.	Geochemistry	Geophysics	<b>Oceanography</b>
Astronomy	Geology	Dif. Calculus	Sed. & Strat.	Phys. Chemistry	Gen. Physics	Synoptic Ocgy.
Phys. Geog.	Structural Geol	Comp. Science	PreCamb. Strat.	Geochemistry	Exploration G.P1	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	Dynamic Ocgy.
	Mineral Deposits	App. Comp. Sim.	Colloidal Prop.	Thesis	Exploration G.P2	Thesis
	Petrology	Geomathematics	Problems in Sed.			
	Petrography & Min.		Thesis			
	Metamorphic Pet.					
	Reading Course					

## **Theses:**

H.B.Sc. Water-Sediment Interactions in a Fresh Water Environment: Western Thunder Bay

Supervisor: J.S. Mothersill

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 Supervisor: J.W. Murray

## **ACADEMIA**

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Geology for Engineers	University of Calgary	2nd year
Sedimentary Petrology	University of Calgary	3rd year
Field School	University of Calgary	3rd year
Sedimentary Environments	University of Calgary	4th year
Advanced Geomathematics	University of Calgary	graduate
Advanced Clastic Sedimentology	University of Calgary	graduate
Intro to Oceanography	University of Colorado	3rd year
Quantitative Dynamic Stratigraphy	University of Colorado	graduate
High Latitude Glacimarine Processes	University of Colorado	graduate
Oceanography	University of Colorado	$4^{th}yr-5^{th}yr$
Polar Marine Sedimentary Environments	University of Tromsö	graduate
Modeling Margins: Sources to Sink	Delft Univ. of Technology	graduate
Modeling Margins: Sources to Sink	CNRS/IGM-Bologna	graduate
Modeling Margins: Sources to Sink	University of Barcelona	graduate

# **Graduate - Supervision**

1995-99	Mark D. Morehead	Ph.D.	CU-Boulder	2003-04	David Pyles	Ph.D.	CU-Boulder
1996-01	Damian B. O'Grady	Ph.D.	CU-Boulder	2004-07	Alex Sinclair	M.Sc.	CU-Boulder
1999-02	David Mixon	M.Sc.	CU-Boulder	2004-07	Albert J. Kettner	Ph.D.	Delft U Tech
1999-03	David Kinner	Ph.D.	CU-Boulder	2007—	Mark T. Hannon	Ph.D.	CU-Boulder
2000-05	Gita Dunhill	Ph.D.	CU-Boulder	2009—	Scott Bachman	Ph.D.	CU-Boulder
2001-07	Eric W.H. Hutton	Ph.D.	CU-Boulder				

# **Graduate - Examiner or Committee Support**

1985-86	Kenneth Asprey	M.Sc.	U Wales	1995-97	Andrew Stein	M.Sc.	CU-Boulder
1990-92	J. Berry	M.Sc.	Dalhousie U	1995-00	Donald Barber	Ph.D.	CU-Boulder
1992-95	Jo Birch	Ph.D.	Dalhousie U	1995-96	Thomas Cooper	M.Sc.	CU-Boulder
1992-95	Ken Skene	Ph.D.	Dalhousie U	1996-00	Kathy Licht	Ph.D.	CU-Boulder
1992-93	Hazen Russell	M.Sc.	Laval U	1996-97	Micalea Smith	M.Sc.	CU-Boulder

1996-97 1996-99 1997-00 1998-01 1998-03 1999-00 2000-02	Dan Levish Brian Welch Stephanie Cartee Micalea Smith Greta Bjork Shane Elipot Sarah Principato	Ph.D. CU-Bo M.Sc. CU-Bo M.Sc. CU-Bo Ph.D. CU-Bo Ph.D. CU-Bo Ph.D. ENSIE Ph.D. CU-Bo	pulder 2001-02 pulder 2001-02 pulder 2004-06 pulder 2002-07 TA, Fr 2008-09	J. Scott Stewart Isla Castenada Irina Overeem Ursula Quillman Remco Groenenberg Yun-zhen CHEN	Ph.D. M.Sc. Ph.D M.Sc. g Ph.D. Ph.D.	CU-Boulder CU-Boulder Delft U Tech CU-Boulder Delft U Tech Nanjing U			
U	Post-graduate Supervision								
1987-89 1993-95	Jay Stravers	PDF Bedford Ins	0.	zaman o orany		J-Boulder J-Boulder			
	Azetsu Scott	PDF Bedford Ins	0.						
1994-95	Thierry Mulder	PDF Bedford Ins	0.	1 0		J-Boulder			
1995-96	Hee Jun Lee	PDF CU-Boulde	r 2002-05	Yu'suke Kubo	PDF CU	J-Boulder			
1996-98	David Bahr	PDF CU-Boulde	r 2007-10	Albert J. Kettner	PDF CU	J-Boulder			
1999-00	Scott Peckham	PDF CU-Boulde	r 2009—	Beichuan Yan	PDF CU	J-Boulder			

# University of Colorado—Boulder Service

Director of INSTAAR

Director of Environmental Computation & Imaging Facility Environmental Program Advisory Committee

Institute Directors Committee

Graduate School Budget Sub-committee

East Campus Research Association

Academic Affairs Budget Advisory Committee Environmental Sciences Building Committee

Administrator Appraisal Oversight Committee

CU Foundation fundraising

CU Research Cabinet

Program Review for CEA Engineering

Interdisciplinary Computational Science and Engineering

Steering Committee

Dean's small grant Committee

Total Learning Environment Scholar

Accounting Streamlining Project

Chair of Summer School Task Force

## PROFESSIONAL EXPERIENCE

Industry:	Position Title	Employer
1973,1975	Geophysicist, Geologist	Falconbridge Nickel Mines
University:		
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—	Professor (Geological Sciences)	University of Colorado at Boulder
1997—	Professor (Geophysics)	University of Colorado at Boulder
1995-07	Director (INSTAAR)	University of Colorado at Boulder
1995—	Fellow (INSTAAR)	University of Colorado at Boulder
2007—	Professor (Oceanography)	University of Colorado at Boulder
2007—	Executive Director of CSDMS	University of Colorado at Boulder
Government:		
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

## **Journal Editorships**

1982-1983 Guest Editor, Sedimentary Geology, Elsevier

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

#### **Professional Services**

Steering Committee: Turbid Water Symposia, 1982, Halifax, Canada

Symposia Chair Sedimentology of Fjords, ISC, 1982, Hamilton, Canada

Chair Arctic Fjords, GSC, 1983, Dartmouth, Canada

Technical Chair Arctic Land-Sea Interactions, 1985, Dartmouth, Canada

Chair Particle Characterization, IUGS, 1986-87, Dartmouth, Canada, Heidelberg, Germany

Session Chair Glaciomarine Processes, Geol Soc, 1989, London, UK
Symposia Chair Glaciomarine Facies Models, ISC, 1990, Nottingham, UK
Session Chair Record of the Continental Ice Sheets, GAC, 1991, Toronto
ONR STRATAFORM Modelers Workshops, 1995-2000.

Convener: High res. seismic Stratigraphy of Quaternary deposits, 1991-1996
Session Chair Quaternary Sedimentation, GAC, 1992, Wolfville, Canada
Session Chair Numerical Modeling of Basins, GAC, 1993, Edmonton, Canada
Numerical Experiments in Stratigraphy, Lawrence, Kansas, 1996

Session Chair: High-resolution records of Climate from Marginal Seas, GSA, Denver, 1996.
Session Chair: Geophysical Flows and Sediment Transport, AGU, San Francisco, 1997.
Co-Convenor: AOSB's Arctic Paleo River Discharge conference, 1997, Boulder, CO.

Session Chair: STRATCON '98, IAS-SEPM, 1998, Sicily

Steering Committee IGBP Land Ocean Interactions in the Coastal Zone 1998 - 2004

Co-Convenor The Oceanographic Society: Extreme & Unexpected Phenomena, Reno 1999

Convenor IGBP-Water Group Sediments Meeting, Boulder, CO 2000

Session Chair

Session Chair Littoral Sediment Transport. EuroDelta Workshop, Bologna, 2002

Session Chair Processes, record, utilization management of Continental Shelves, Hong Kong, 2002

Session Chair

Session Chair Marine Records, 33<sup>rd</sup> Arctic Workshop, Tromso, Norway, 2003

Session Chair River-Estuary Interactions, ERF, Seattle, 2003

Session Chair Coastal Processes and Evolution, Oceans Conference, San Diego, 2003
Session Chair Mechanisms and Magnitudes: Global Water System Project: Portsmouth, 2003

Session Chair Coupled process-response models, IGC, Florence 2004

Session Chair Strata Formation on European Continental Margins, AGU San Francisco, 2004

Session Chair 34th Arctic Workshop, Boulder, 2004

Steering Committee
Session Chair
Session Chair
Ex-officio SSC
SCOR-sponsored Sediment Retention in Estuaries
Large Continental Rivers, AGU New Orleans, 2005
IGBP Land Ocean Interactions in the Coastal Zone 2005

Session Chair Ecological Dynamics of Deltas, LOICZ, 2005, Egmand von Zee, Netherlands
Session Chair Dynamics of the Adriatic, EuroSTRATAFORM, Salamanca, Spain, 2005

Dynamics of the Adriatic Chair C

Session Chair Particle Dynamics of Rivers, Coasts, Estuarine Morphdynamics – Urbana, 2005

Session Chair Integrated Strata Analysis, IAS Congress, Fukuoka, Japan, 2006

Session Chair New Models for Fluvial & Coastal Sediment Transport & Surface Dynamics, AGU San Fran, 2006

Session Chair Sediment Transfer From Land Through the Ocean, AGU San Francisco, 2006

Convenor Dynamics and Vulnerability of River Delta Systems, GWSP/LOICZ/CSDMS, 2007, Boulder Convenor Mechanisms of Sediment Retention in Estuaries, SCOR/LOICZ/CSDMS, 2007, Boulder

Steering Committee Arctic Coastal Zones at Risk, LOICZ/IASC, Tromsø, Norway, 2007

Session Chair IAHS Sediment Dynamics in Changing Environments, Christchurch, New Zealand, 2008

# **Funded Research Projects**

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Period	\$Can	Agency	Research Site	Project Funded
1978-79	\$20 K	NSERC	University of Calgary	Sedimentation in Lakes
1979-80	\$50 K	NSERC	University of Calgary	Particle Floatation
1981-89	\$820 K	EMR	GSC	Sedimentology of Arctic Fjords Experiment
1982-89	\$190 K	EMR	GSC	Suspended Particulate Matter In Situ
1986-95	\$1100 K	EMR	GSC & NSERC	Transfer of Sediment from Land to Sea
1987-93	\$2200 K	EMR/NSERC	C/NGI GSC	ADFEX: Arctic Delta Failure Experiment
1992-95	\$700 K	NRCan	GSC-Global Change	Marine Proxy Climatic Record & Models
1995	\$130 K	ONR	GSC	STRATAFORM: Formation of strata on Margins

# **Principal Investigator United States**

Principal Investigator United States									
Period	\$US	Agency	Research Site	Project Funded					
1996-99	\$110 K	ONR	INSTAAR	Numerical Coupling of discharge to sedimentation models					
1995-02	\$702 K	ONR	INSTAAR	STRATAFORM					
1997-98	\$91 K	ONR	INSTAAR	Particle Dynamic Laser and Camera System					
1997-99	\$360 K	Mobil	INSTAAR	Data Base Development and Models for Stratigraphy					
1998-99	\$135 K	Raytheon	INSTAAR	Satellite Data Model Fusion: Littoral Sed. Transport					
2000-01	\$1100 K	ONR&Sun	INSTAAR	Environmental Computation & Imaging (ECI) Facility					
2000-04	\$650 K	ONR	INSTAAR	Geoclutter: Buried Channels on Continental Shelves					
2001-04	\$200 K	ONR	INSTAAR	Sediment Flux to the Coastal Zone: Prediction for the Navy					
2001-04	\$143 K	NSF	INSTAAR+	MARGINS: Experimental and Theoretical Studies					
2001-04	\$437 K	ExxonMobil	INSTAAR	Development of 2D and 3D-SedFlux					
2001-04	\$343 K	ONR	INSTAAR+	Seabed variability and its influence on acoustic prediction					
2002-03	\$440 K	ONR	INSTAAR	EuroSTRATAFORM: Modeling Margin Sedimentation					
2001-02	\$50 K	NSF	INSTAAR	Community Sediment Model					
2004-06	\$189 K	NASA	INSTAAR	Changing C & N & Water Cycles in the Earth System					
2004-06	\$24 K	Indiana St U	INSTAAR	Sediment production & buffering in the Waipaoa R., NZ					
2005-09	\$540 K	ONR	INSTAAR	Sediment dynamics of World deltas & Estuaries					
2006-11	\$4.5 M	NSF	CSDMS	Community Surface Dynamics Modeling System					
2007-10	\$313 K	NASA	CSDMS	Analysis of inland and coastal water fluxes					
2007-09	\$150 K	ConocoPhil	CSDMS	Sedimentary Environments					
2008-09	\$70 K	ExxonMob	CSDMS	Community Surface Dynamics Modeling System					
2009-10	\$30K	StatoilHydro	CSDMS	Community Surface Dynamics Modeling System					

# **Funded Research Projects as Co-PI**

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

# **Ship-based Research**

1974	M/V Martin Carlson	Lake Superior	Geochemistry	1981	HMAV St. Anthony;		
1976	M/V Sea Lion	Fraser River	Sedimentology		Pisces IV	B.C. Fjords	Sedimentology
1977	HMAV Endeavor	Georgia Straight	Geophysics	1981	M/V Pandora II;		
1976	M/V Active Lass	Howe Sound	Chief Scientist		Pisces IV	Gulf St. Lawrence	Chief Scientist
1977	M/V Active Lass	Howe Sound	Chief Scientist	1982	CSS Dawson	Saguenay	Watch Leader
1979	M/V Pandora II	B.C. Fjords	Chief Scientist	1982	CSS Hudson	Baffin Fjords	Senior Scientist
1980	HMAV St. Anthony;			1983	CSS Hudson	Baffin Fjords	Chief Scientist
	Pisces IV	B.C. Fjords	Chief Scientist	1984	CSS Louis Lauzier	Saguenay	Chief Scientist

1985	M/V Pandora II;			1988	Chinese Ferry Boat	South China Sea	Watch Leader
	Pisces IV	Baffin Fjords	Chief Scientist	1989	CSS Dawson	Gulf St. Lawrence	Chief Scientist
1986	CSS Dawson	Gulf St. Lawrence	Coordinator	1989	CSS Baffin	Lake Melville	Watch Leader
1987	CSS Dawson	Gulf St. Lawrence	Chief Scientist	1991	CSS Hudson	Lake Melville	Chief Scientist
1988	CSS Dawson	Lake Melville	Watch Leader	1993	CSS Hudson	Greenland, Iceland	Chief Scientist

#### **EXAMPLES OF 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 demonstrate
  - Climate-driven impacts on discharge and sediment load.
  - How isostasy impacts the architecture of river deltas.
  - How multiple transport pathways affect the long term fill of sedimentary basins under complex sea level fluctuations
- 4. Developed new concepts on biological-sediment interactions
  - Zooplankton response to the ingestion of suspended sediment
  - Seafloor pits developed from large sea mammals in deep high arctic environments
  - Corals move large boulders through current drag on their fans.
  - Arctic benthic respond 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 to ascertain the accuracy of commercial and non-commercial methods of particle size analysis.
- 7. Emplacement of oceanographic moorings in the offshore arctic via helicopter.
- 8. New theory for the formation of arctic placer deposits as related to the concept of thermal erosion.
- 9. Use of organic carbon as a method to hindcast sedimentation rates and summer temperatures in arctic environments.
- 10. Developed method for estimating the rating coefficients related to the short term variability of rivers
- 11. First predictions on the seasonal flux of sediment discharge of global rivers
- 12. New paradigm of delta morphology under the influence of human activity.

#### PROFESSIONAL INFLUENCE

- 1. Sedimentology advisor to publishers Elsevier, Springer, Cambridge U Press, Allen Press.
- Consultant to the U.S. Office of Naval Research and NATO Naval Geoscience initiatives (Arctic seafloor acoustics, Mine Burial, Mine Countermeasures, Antisubmarine Warfare, Arctic Submarine Operations, Special Operations, Uncertainty, Korean Tidal Flats)
- 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. Journal reviewer for 20 journals;  $\approx$  25 manuscripts per year.
- 5. Journal Editor, Assoc. Editor, and Editorial Board of international journals.
- 5. Annual reviewer of research proposals to US, Canadian and European funding agencies.
- 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 (92-95).
- 8. Selection Panel for the Huntsman Award for Outstanding Achievements in Oceanography (1991-96).
- 9. Convenor of the IUGS Working Group of Particle Size Characterization (1984-90).
- 10. Convenor of the INQUA W. G. on High Res. Seismic Stratigraphy of Glacigenic Deposits (1990-96).
- 11. Advisor to U.S. Dept. of Justice with respect to marine pollution (1992-93).
- 12. Director, INSTAAR, University of Colorado at Boulder (1995-2007)
- 13. Co-leader of ONR's STRATAFORM (Strata Formation on Continental Margins) 35 PIs: (1994-2002)
- 14. Scientific Advisory Committee and Panel Reviewer for NSF/ONR SCICEX US Nuclear Submarine Science (1996-99).
- 15. Scientific Advisory Committee for NSF RAISE Land-Shelf Interaction Program (1996-00).
- 16. Scientific Steering Committee IGBP Land Ocean Interactions in the Coastal Zone 1998 2002
- 17. Scientific Steering Committee for AOSB Arctic Paleo River Discharge (1998-01).
- 18. Scientific Advisor to IGBP (Global Change) Water Initiative (2000-02)
- 19. Co-leader of EuroSTRATAFORM with ONR and EC funding 100 PIs: (2002-)
- 20. Scientific Advisory Committee for NSF Arctic Hydrology Program CHAMPS (2002-03)
- 21. Scientific Advisory Committee for NSF Margins: Source to Sink Program (2001-02)
- 22. Co-leader of the Community Surface Dynamic Modeling Initiative (2001-06); Executive Director CSDMS (2007-)
- 23. Co-leader of the Deltas at Risk GWSP/LOICZ/CSDMS Initiative (2007-)
- 24. Co-leader of the Sediment Retention in Estuaries SCOR/LOICZ Initiative (2006-08)

#### RECOGNITION

- 1. International project leader or co-leader:
  - SAFE: 4 countries (Canada, US, UK, Netherlands); 35 scientists
  - IUGS Size Characterization: 20 countries (North America, Western Europe, Asia, Africa and India); 54 scientists
  - ADFEX: 5 countries (Can., Norway, France, UK, Poland); 22 scientists
  - SEDFLUX: 6 countries (Canada, US, Iceland, China, Denmark, Germany); 40 scientists
  - ODP/CCDP Global Change Drilling: 4 countries (Canada, US, UK, Norway), 19 scientists
  - STRATAFORM (US, Canada): 35 PIs and 45 Co-Is
  - EuroSTRATAFORM (US, Canada, Europe); 100 PIs
  - CSDMS (US, Europe): 250 PIs, 22 countries
- 2. Executive member of ad hoc committee on Sedimentology of the International Union of Geological Sciences, 1985-88
- 3. Panel Expert on the 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, UQAR, 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 Cyberinfomatics 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

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

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

### Presentations & Addresses Symposia, Congresses, Conferences, Workshops

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; 28th, Boulder CO, 1998; 29th Seattle, WA, 1999; 30th Boulder, CO, 2000, 32nd Boulder, CO, 2000, 33rd Tromso, Norway, 2003, 34th Boulder CO, 2004

2nd Canadian Workshop of Ocean Drilling Program, Waterloo ON, 1989

2nd Canadian Geotech. Workshop on Offshore In Situ Techniques, Quebec QU, 1990

53rd Congress Assoc. of Canadian Francophone Academics, Chicoutimi QU, 1985

12th International Congress of Quaternary Research, Ottawa ON, 1987

International Geological Congress, 28th Washington DC, 1989, 29th Kyoto, Japan, 1992, 32nd Florence, Italy 2004

International Sedimentological Congress, 11th Hamilton ON, 1982, 13th Nottingham UK, 1990; 17th Fukuoka, Japan, 2006

1st Mid-year SEPM Conference, San Jose CA, 1984

4th PONAM Workshop, Cambridge UK, 1993.

American Geophysical Union (AGU) Fall meeting, San Francisco, 1995-2007

American Geophysical Union (AGU) Spring meeting, New Orleans, 2005

AGU Chapman Conference, Puerto Rico, 2001

Antarctic Offshore Acoustic Stratigraphy Symposium, Siena Italy, 1994

Canadian Hydrology Symposia - 1990, Burlington ON,

Canadian Quaternary Association: Coastal Glaciomarine Environments, Fredricton NB, 1991

Canyons Workshop –European Commission: Sitges, Spain 2002

COLDSEIS Workshop, Halifax, Canada, 1995

Conference of the Geological Association of Canada, Halifax NS, 1980; Victoria BC, 1983; Toronto ON, 1991; Wolfville NS, 1992; Edmonton, AL, 1993; Victoria, BC, 1995

AAPG/SEPM Conference, Calgary, Canada, 1997; Houston, 2006, Orange County, 2007, San Antonio, 2008

Geological Society London: Deltas, London UK, 1986; Glaciomarine Processes, London UK, 1988; Glacier-influenced Sedimentation, Bristol UK, 2001

Geological Society of America (GSA), Denver, 1996; Philadelphia, 2006

George Bush 3<sup>rd</sup> China-US Relations: Energy, Security, Environment, DC, 2007,

ExxonMobil, Huston TX, Margins Source to Sink Short Course, 2002

International Conf. Abrupt Climate Change in Clastic Sedimentary Environments, Stockholm, Sw. 1998

International Workshop on Sedimentary Processes and Paleoenvironments in Fjords, Tromso, Norway, 1998.

International Assoc. of Mathematical Geologists, 3rd Barcelona Spain, 1997; 7th Cancun Mexico, 2001

IUGS-COS Workshop on Particle Characterization, Dartmouth NS, 1986; Heidelberg Germany, 1987

ICARP: International Conference on Arctic Research Planning, Hanover, NH, 1996

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

Quantitative Dynamic Stratigraphy Workshop, Golden CO, 1988

Quatriemes Entretiens Jacques Cartier re: Hazards, Lyon/Grenoble FRA, 1990

Québec Quaternary Association Workshop, Rimouski QU, 1988

Ocean Sciences Meeting (AGU/ASLO/TOS), San Diego, 1996; Honolulu, 2006, Orlando, 2008

ONR Microstructure Workshop - Stennis Space Centre, Slidell LA, 1988

ONR STRATAFORM Workshop, San Diego, CA, 1996; San Francisco, CA, 1997; Keystone, CO, 1998; Monterey, CA, 1999

ONR STRATAFORM Modelers Workshop, Boulder, CO, 1996; Minneapolis, MN, 1997; Dallas, TX, 1998; Durham, NC, 2000; Arlington, 2001

ONR STRATAFORM Slope Workshop, Arlington, VA, 1995; Monterey, CA, 1997; Boulder, CO, 1999

Numerical Experiments in Stratigraphy, Lawrence, KS, 1996

Paleoceanography of the North Atlantic Margin, Edinburgh UK, 1995

Pierre Beghin Slope Stability Workshop, Grenoble, France, 1993

SEPM Fine-grained Sediment Research Workshop, San Jose CA, 1984

SEPM-IAS STRATCON 98, Sicily, 1998

SEPM-AAPG, Denver, CO, 2001

TEXACO workshop on Dynamic Geological Modeling, Houston TX, 1991

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

ARCO, Plano, TX

Chinese Geological Academy, Beijing, China City College, CUNY, New York

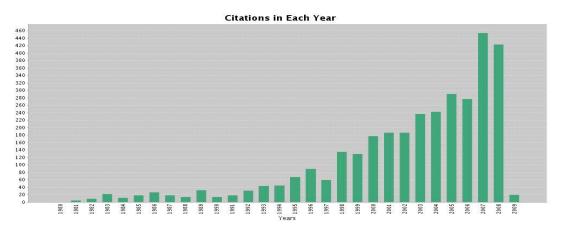
Cambridge University, UK

Colorado School of Mines, Golden USA
Columbia University, USA
Dalhousie University, Canada
Delft University of Technology, Netherlands
Desert Research Institute, Reno, USA
Duke University, Durham, NC, USA
ExxonMobil Technology, Huston, TX
Geological Nuclear Science, Wellington, NZ
Geological Society of America, Houston, TX
Geological Society, Edinburgh, UK
Geological Survey of Canada Branches: Vancouver,
Ottawa, Dartmouth, Calgary, Victoria
Institute of Arctic and Alpine Research, Boulder, USA

Institute Of Hydroengineering, Gdánsk, Poland Institute of Marine Geology (CNR)- Bologna Institute of Ocean Sciences, Patricia Bay, Canada Institute of Ocean Sciences, Wormley, UK Korean Ocean Research Development Institute, Assan Korean Polar Research Institute, Incheon Lakehead University, Canada Lamont-Doherty Geological Observatory, USA Laval University, Canada Macquarie University, Sydney, Australia, McGill University, Canada MOBIL Technology Center, Dallas Mount Sinai Medical Center, New York, USA Naval Oceanographic Office, Stennis Space Center Polish Geological Academy, Krákow, Poland SAGA Petroleum, Oslo, Norway Scipps Oceanographic Institute, La Jolla CA Simon Fraser, University, Canada

St. Mary's University, Canada TEXACO Technology, Dallas University of Alberta, Canada University of Barcelona, Spain University of Bellingham, USA University of Bergen, Norway University of Bergen, Norway University of British Columbia, Canada University of Calgary, Canada University of Chicago, IL University of East Anglia, UK University of Glasgow, UK University of Heidelberg, Germany University of Illinois at Chicago University of Milwaukee, USA University of Nebraska, Lincoln, USA 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, Sweeden 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

PUBLICATION STATISTICS (Jan 2009)						
ISI Peer-reviewed Journal Publications (includes in press).	117					
Manuscripts in preparation or review	9					
Peer-reviewed Books and Book Chapters	51					
Editor of Peer-reviewed Special Issues	9					
Peer-reviewed Conference Proceedings	39					
Journal Published Book Reviews	11					
Peer-reviewed Government Reports	56					
Unpublished & Limited-Distribution Manuscripts	9					
Published Conference Abstracts	<u>207</u>					
TOTAL	508					



### **Kev** (≤ 10) **Publications by Career Research Topics**

Note: Statistics were updated for publications and ISI Citation hits as of Jan 2009. The total number of journal citations then was 3,313 (excluding books and book chapters) with an h-index = 31. Only citation hits  $\geq$ 25 are highlighted below. Papers are also listed chronologically, by publication category, further down in the CV.

#### 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 1978 Doctoral studies. Fundamentals of river plumes, turbidity currents, sediment failure, flocculation dynamics, carbon sequestration, and ice age processes were advanced (see other sections as well). The scholarly text (5) was well received (e.g. "simply outstanding in breadth and depth" Science, 1988). In 1998 in Tromso Norway, at an international conference on fjords, I provided the keynote address, reflecting on my 25 years of fjord research.

- 1. Syvitski, J.P.M. 1989. On the deposition of sediment within glacier-influenced fjords: Oceanographic controls. Marine Geology, 85: 301-329. Citation hits: 89
- 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.) <u>Deltas: Sites and Traps for Fossil Fuels</u>. Geological Society of London Special Publication No. 41: 21-43. <u>Citation hits: 33</u>
- 3. Syvitski, J.P.M., Andrews, J.T., and Dowdeswell, J.A. 1996. Sediment deposition in an iceberg-dominated glacimarine environment, East Greenland: basin fill implications. Global and Planetary Change: 12: 251-270. Citation hits: 52
- 4. Syvitski, J.P.M. and Schafer, C.T. 1996. Evidence for an earthquake-triggered basin collapse in Saguenay Fjord, Canada. <u>Sedimentary Geology</u>, 104: 127-153. <u>Citation hits: 43</u>
- 5. Syvitski, J.P.M., Burrell, D.C. & Skei, J.M. 1987 Fjords: Processes & Products. Springer-Verlag, N.Y. 379 pp. Citation hits: 170
- 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.
- 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.) <u>Glaciomarine Environments: Processes and Sediments</u>. Geological Society, London, Spec. Publ. 53: 217-239. <u>Citation hits: 25</u>
- 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.) <u>Global Sedimentary Geofluxes</u>. National Academy of Sciences Press, Washington, Ch. 7: p. 99-115.

#### SEDIMENT DELIVERY BY RIVERS



A fundamental problem in biogeochemistry is to predict the sediment delivery by rivers since so few are monitored. Twenty-five papers highly cited were published on this hydrological topic, including review papers, and a special journal issue, including a paper with John Milliman (2) that led to insight into 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. <u>Sedimentary Geology</u>, 162: 5-24. Citation hits: 41
- 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. <u>Journal of Geology</u> 100: 525-544. <u>Citation hits: 734</u>
- 3. Mulder, T. and Syvitski J.P.M. 1996. Climatic and morphologic relationships of rivers. Implications of sea level

- fluctuations on river loads. Jour. of Geology 104: 509-523. Citation hits: 47
- 4. Syvitski, J.P. and Morehead, M.D., 1999. Estimating river-sediment discharge to the ocean: application to the Eel Margin, northern California. <u>Marine Geology</u>, 154: 13-28. <u>Citation hits: 85</u>
- 5. Syvitski, J.P.M., Morehead, M.D., Bahr, D., and Mulder, T., 2000. Estimating fluvial sediment transport: the Rating Parameters. <u>Water Resource Research</u>, 36: 2747-2760. <u>Citation hits: 45</u>
- 6. Morehead, M.D., Syvitski, J.P.M., Hutton, E.W.H., and Peckham, S.D. 2003. Modeling the inter-annual and intra-annual variability in the flux of sediment in ungauged river basins. Global and Planetary Change. 39 (1/2): 95-110. Citation hits: 31
- 7. Vorosmarty, C., Meybeck, M., Fekete, B., Sharma, K., Green, P. and Syvitski, J.P.M., 2003, Anthropogenic sediment retention: Major global-scale impact from the population of registered impoundments. <u>Global and Planetary Change</u>, 39 (1/2): 169-190. <u>Citation hits:</u> 79
- 8. 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. Citation hits: 41
- 9. Syvitski, J.P.M., Vörösmarty C, Kettner A.J., Green, P. 2005, Impact of humans on the flux of terrestrial sediment to the global coastal ocean. <u>Science</u>, 308: 376-380. <u>Citation hits: 96</u>
- 10. 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. Citation hits: 36
- 11. Syvitski, J.P.M. 2002, Sediment Transport Variability in Arctic Rivers: Implications for a Warmer Future. <u>Polar Research</u>, 21(2): 323-330. <u>Citation hits: 26</u>
- 12. Syvitski, J.P.M. and Milliman, J.D., 2007, Geology, geography and humans battle for dominance over the delivery of sediment to the coastal ocean. <u>J. Geology</u>, 115: 1-19.

#### SUSPENDED PARTICLE DYNAMICS



From early graduate times, I have worked to understand how river sediment clumps together once it reaches the marine environment. The work led to pioneering 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, size, concentration and density of individual particles was determined leading to new theories on sedimentation.

- Syvitski, J.P.M. and Murray, J.W. 1981. Particle interaction in fjordsuspended sediment. <u>Marine Geology</u>, 39: 215-242. <u>Citation hits:</u> 70
- 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. Citation hits: 46
- 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.) <u>The Microstructure of Fine-grained Sediment from Muds to Shale</u>. 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. Syvitski, J.P.M. and Hutton, E.W.H. 1996. *In situ* characteristics of suspended particles as determined by the Floc Camera Assembly FCA. <u>Journal of Sea Research</u> 36: 1-12.
- 6. Syvitski, J.P.M., Asprey, K.W. and LeBlanc, K.W.G. 1995. In-situ characteristics of particles settling within a deepwater estuary. <u>Deep-Sea Research</u> II 42(1): 223-256. Citation hits: 56
- 7. Syvitski, J.P.M. and Hutton, E.W.H., 1997. FLOC: Image analysis of marine suspended particles. <u>Computers and Geoscience</u>, 23(9): 967-974.
- 8. 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. Citation hits: 53
- 9. Azetsu-Scott, K., and Syvitski, J.P.M. 1999. How melting icebergs influence particle distribution in the water column. <u>Journal of Geophysical Research</u>, 104: 5321-5328.
- 10. 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. <u>Marine Geology</u>. 203: 83-94.

#### **DELTAS and PRODELTAS**



I began with an early appreciation for how deltas result from both autocyclic responses and allocyclic forces, as do their prodelta environments. River plume behavior plays an important crucial 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. <u>Sedimentary Geology</u>, 36: 217-244. Citation hits: 35
- 2. Syvitski, J.P.M., Smith, J.N., Boudreau, B. and Calabrese, E.A. 1988. Basin sedimentation and the growth of prograding deltas. <u>Journal of Geophysical Research</u>, 93: 6895-6908. <u>Citation hits: 54</u>
- 3. Morehead, M.D., and Syvitski, J.P., 1999. River Plume Sedimentation Modeling for Sequence Stratigraphy: Application to the Eel Shelf, California. <u>Marine Geology</u> 154:29-41. Citation hits: 29
- 4. Syvitski, J.P.M., Kettner, A., 2007, On the flux of water and sediment into the Northern Adriatic. <u>Continental Shelf Research</u>, 27: 296-308.
- 5. Trincardi, F., and Syvitski, J.P.M. (Eds.) 2005, Mediterranean prodelta systems. Marine Geology Special Issue, vol. 222-223: 520 pp.
- 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. <u>SEPM Special Publication</u> No. 83, pp. 13-30.
- 7. Syvitski, J.P.M., Kettner, A.J., Correggiari, A., Nelson, B.W. 2005, Distributary channels and their impact on sediment dispersal. <u>Marine Geology</u> 222-223: 75-94.
- 8. Syvitski, J.P.M., Saito, Y. 2007, Morphodynamics of Deltas under the Influence of Humans. Global and Planetary Changes. 57: 261-182.
- 9. Syvitski, J.P.M., Harvey, N., Wollanski, E., Burnett, W.C., Perillo, G.M.E., and Gornitz, V. 2005. Dynamics of the Coastal Zone. In: C. J. Crossland, H.H. Kremer, H.J. Lindeboom, J.I. Marshall Crossland, M.D.A. Le Tissier (Eds.) Global Fluxes in the Anthropocene. Springer, Berlin, pp. 39-94.
- 10. Syvitski, J.P.M., 2008. Deltas at Risk. Sustainability Science, 3: 23-32.

#### GLACIAL & PARAGLACIAL SEDIMENTATION and STRATIGRAPHY

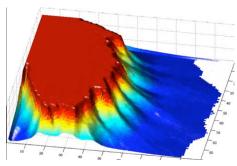


The largest body of literature I have written (i.e. > 60 papers, books, map series) is on the imprint of former ice sheets as they advanced and retreated across world continental margins. The body of work redefined paradigms of ice marginal sedimentation through a mass balance approach using very-high resolution geophysical data. Community response for this effort was an acoustic atlas edited by Davies, T.W. et al., (Chapman & Hall, London), that was 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." Fieldwork ranged included the Gulf of St. Lawrence, Baffin region, and the North Atlantic.

- 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. <u>Géog. physique et Quaternaire</u>, 43(3): 291-310.
- 2. Syvitski, J.P.M. 1991. Towards an understanding of sediment deposition on glaciated continental shelves: sequence stratigraphy. Continental Shelf Research 11: 897-937. Citation hits: 38
- 3. Syvitski, J.P.M. 1993. Glacimarine environments in Canada: An overview. <u>Canadian Journal of Earth Sciences</u> 30: 354-371. Citation hits: 25
- 4. Syvitski, J.P., Stoker, M., and Cooper, A. K. (Editors) 1997. COLDSEIS: Seismic Facies of Glacigenic Deposits. Marine Geology 143 (1/4): 262 p.
- 5. Syvitski, J.P.M. Lewis, C.F.M., and Piper, D.J.W.\_1996. Paleoceanographic information derived from acoustic surveys of glaciated continental margins: examples from eastern Canada. In: J.T. Andrews, W.E.N. Austin, H. Bergsten, and A.E. Jennings (eds.) <u>Late Quaternary Palaeoceanography of the North Atlantic Margins</u>,

- Geological Society Special Publication No. 111, pp. 51-76.
- 6. Forbes, D. and Syvitski, J.P.M., 1995. Paraglacial Coasts. In C. Woodruffe and R.W.G. Carter (eds.) <u>Coastal Evolution</u>. Cambridge University of Press, Cambridge, UK. Chapter 10: p. 373-424.
- 7. Andrews, J.T., Hardardottir, J., Helgadottir, G., Jennings, A. E., Sveinbjornsdottir, A, Geirsdottir, A., Schoolfield, S., Kristjansdottir, G.B., Smith, L.M., Thors, K., and Syvitski, J.P. 2000. The N and W Iceland shelf: insight into Last Glacial Maximum ice extent and deglaciation based on acoustic stratigraphy and basal radiocarbon AMS dates. Quaternary Science Reviews 19: 619-631. Citation hits: 45
- 8. Stravers, J.A. and Syvitski, J.P.M. 1991. Early Holocene land-sea correlations and deglacial evolution of the Cambridge Fiord basin, Northern Baffin Island. <a href="Quaternary Research">Quaternary Research</a> 35: 72-90.
- 9. Syvitski, J.P.M., Jennings, A., Andrews, J.T.1999 High-resolution seismic evidence for multiple glaciations across the southwest Iceland Shelf. Arctic, Antarctic and Alpine Research, 31: 50-57. Citation hits: 25
- Jennings, A.E., Syvitski, J.P., Gerson, L., Gronvold, K., Geisdottir, A., Hardardottir, J., Andrews, J.T., Hagen, S.
   2000. Chronology and paleoenvironments during the late Weichselian deglaciation of the SW Iceland Shelf.
   Boreas, 29: 167-183. Citation hits: 31

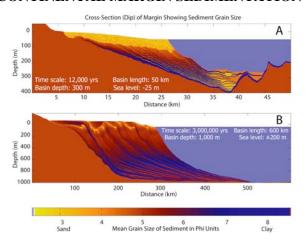
## SIMULATION OF SEDIMENT TRANSPORT AND STRATIGRAPHY



Over the last half of my career, 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 ungauged rivers, (ii) investigate the impact of climate on the architecture of river deltas, and (iii) show how multiple transport pathway affect the long term fill of sedimentary basins under complex sea level fluctuations. The models are being applied to understand the seafloor environment for the U.S. Navy, and to aid in the characterization of petroleum reservoirs. The effort forms my second largest body of literature (>50 papers and books). My models were highlighted in the review by Chris Paola (Sedimentology, 2000) that noted that these models "would be to sedimentary geology what global climate models are to atmospheric science".

- 1. Syvitski, J.P.M. 1989. The process-response model in Quantitative Dynamic Stratigraphy. In: T.A. Cross (ed.) Quantitative Dynamic Stratigraphy. Prentice-Hall, N.Y., p. 309-334.
- Syvitski, J.P.M., Morehead, M. and Nicholson, M. 1998. HYDROTREND: A climate-driven hydrologic-transport model for predicting discharge and sediment to lakes or oceans. <u>Computers and Geoscience</u>, 24(1): 51-68. <u>Citation hits: 26</u>
- 3. Syvitski, J.P.M., Nicholson, M., and Skene, K., Morehead, M.D.1998. PLUME1.1: Deposition of sediment from a fluvial plume. <u>Computers and Geoscience</u>, 24(2): 159-171. <u>Citation hits: 25</u>
- 4. Syvitski, J.P., and Hutton, E.H., 2001. 2D SEDFLUX 1.0C: An advanced process-response numerical model for the fill of marine sedimentary basins. <u>Computers and Geoscience</u> 27(6): 731-754.
- 5. Syvitski, J.P.M. and Daughney, S. 1992. DELTA-2: Delta progradation and basin filling. <u>Computers and Geosciences</u> 18(7): 839-897. <u>Citation hits: 26</u>
- 6. Mulder, T., Savoye, B. and Syvitski, J.P.M. 1997. Numerical modelling of the sediment budget for a mid-sized gravity flow: the 1979 Nice turbidity current. <u>Sedimentology</u>, 44: 305-326. <u>Citation hits: 55</u>
- 7. Skene, K., Mulder, T., and Syvitski, J.P.M., 1997, INFLO1: A model predicting the behaviour of turbidity currents generated at a river mouth. <u>Computers and Geoscience</u>, 23(9): 975-991. <u>Citation hits: 29</u>
- 8. Overeem, I., Syvitski, J.P.M., Hutton, E.W.H., and Kettner, A.J. 2005. Stratigraphic variability due to uncertainty in model boundary conditions: a case-study of the New Jersey Shelf over the last 21,000 years. Marine Geology 224: 23-41.
- 9. Morehead, M.D., Syvitski, J.P.M., Hutton, E.W.H., and Peckham, S.D. 2003. Modeling the inter-annual and intraannual variability in the flux of sediment in ungauged river basins. <u>Global and Planetary Change</u>, 39 (1/2): 95-110. <u>Citation hits:</u> 31
- Syvitski, J.P.M., Pratson, L.F., Wiberg, P.L., Steckler, M.S., Garcia, M.H., Geyer, W.R., Harris, C.K., Hutton, E.W.H., Imran, J., Lee, H.J., Morehead, M.D., and Parker, G., 2007. Prediction of margin stratigraphy. In: C.A. Nittrouer, J.A. Austin, M.E. Field, J.H. Kravitz, J.P.M. Syvitski, and P.L. Wiberg (Eds.) Continental-Margin Sedimentation: From Sediment Transport to Sequence Stratigraphy. <u>IAS Spec. Publ.</u> No. 37: 459-530.

## CONTINENTAL MARGIN SEDIMENTATION



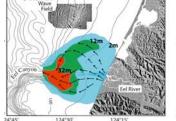
Andrew Miall in his 1995 review "Whither Stratigraphy" (Sedimentary Geology) states that three revolutions in sedimentary geology have taken place: (i) plate tectonics, (ii) process-response sedimentary models, and (iii) sequence stratigraphy. Recently my application of these models to understanding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

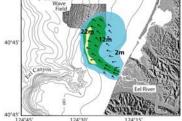
 Ross, W. C., Halliwell, B. A., May, J. A., Watts, D. E., and Syvitski, J. P. M. 1994. The Slope Readjustment Model: A New Model for the Development of

Submarine Fan/Apron Deposits. Geology: 22: 511-514. Citation hits: 43

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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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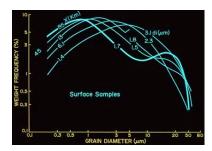
#### SEDIMENT-ANIMAL INTERACTIONS



I have always been 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.

- 1. Syvitski, J.P.M. and Lewis, A.G. 1980. Sediment ingestion by Tigriopus californicus and other zoo plankton: Mineral transformation and sedimentological considerations. <u>J. Sedimentary Petrology</u>, 50:869-880. Citation hits: 33
- 2. Smith, N.D. and Syvitski, J.P.M.1982. Sedimentation in a glacier-fed lake: The role of pelletization on deposition of fine-grained suspensates. <u>Journal of Sedimentary Petrology</u>, 52: 503-513.
- 3. Lewis, A.G. and Syvitski, J.P.M.1983. Interaction of plankton and suspended sediment in fjords: <u>Sedimentary Geology</u>, 36: 81-92.
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- 5. Tunnicliffe, V. and Syvitski, J.P.M. 1983. Corals assist boulder movement: An unusual mechanism of sediment movement. <u>Limnology and Oceanography</u>, 28: 564-568.
- Farrow, G.E., Syvitski, J.P.M. and Tunnicliffe, V. 1983. Suspended particulate loading on the macrobenthos in a highly turbid fjord; Knight Inlet, British Columbia. <u>C. J. Fisheries and Aquatic Sciences</u>, 40: p. 100-116. <u>Citation hits: 42</u>
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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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- 3. Coakley, J.P. and Syvitski, J.P.M. 1991.SediGraph technique. In: J.P. Syvitski (ed.) <u>Principles, Methods and Application of Particle Size Analysis</u>. Cambridge University Press, N. Y. p. 129-142.
- 4. Syvitski, J.P.M. (ed.) 1991. <u>Principles, Methods and Applications of Particle Size Analysis</u>. Cambridge University Press. New York. 368 p. <u>Citation hits:</u> 85
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# Published comments on the 1987 Fjord book

"useful for a wide variety of scientific specialists...well written, logically constructed and clearly presented"

Sedimentology

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"A book for which many scientists have been waiting" American Scientist

"welcomed by coastal geomorpholgists, oceanographers and Pleistocene climatologists ... suburb summary ... a bibliography goldmine" Geo journal

## Some published comments on the 1991 Grain Size book

"The volume is a must for every worker or institution spending time with particle-size analysis" AAPG Bulletin

"The book provides fundamental and detailed practical information to any scientist, who wands to apply sediment particle characterization ... we now have a comprehensive and balanced synthesis of this broad theme"

Earth Science Reviews

"This book is a must to own for all who are involved in the field" Basin Research

## Collaborators on large projects

**ADFEX** 

Environment Canada CCIW - Hamblin Norwegian Geotechnical Institute - Norem, Karlsrud

Laval -Locat, Konrad UBC -LeBlond. U Calgary -Hein MUN -Hay,

INRS-Océanologie - Long CEMAGREF - Brugnot, Beghin

GSC Terrain Science - Dave Sharp Polish Inst. Hydroengineering - Sawicki

Petrobras – Rorigues UAlberta -Robertson

USGS Menlo - Lee

**SAFE** 

UAlberta -Hein, Longstaffe, Sego, Reasoner, Environment Canada, NHRI

Laval -Locat, Masson MUN -Hay, Foley, Colbourne, Gardner, Macko, Pulchan, Ivy

INSTAAR-Stravers, Andrews, Jennings, Osterman, Williams, Canadian Hydrography -Rodgers, Lamplugh Royal Roads Military College-Mothersill, Tabrez

Short UEast Anglia- Boulton QueensU-Gilbert, Dale, Aitken, McKenna-Neuman, Horvath

UGlasgow-Farrow US. ONR -Kravitz

Simon FraserU-Albright, Stroh DFO-Smith, Ellis, Trites, Petrie

UNetherlands -van der Meer, Cameraat Scottish Biol. Station - Atkinson, Moore

C-CORE - Emory-Moore

**SEDFLUX** 

McGill -D'Anglejan UQAR -Hill

UQAM -Occhietti, NIU -Stravers, Powell Dalhousie -Gibling MUN -Hay, Aksu

Environment Canada CCIW - Hamblin, Coakley Water survey of Canada - Day UCalgary -Hein, ULaval - Chagnon, Locat, Frenette

INSTAAR – Andrews INRS-Océanologie - Long

GSC -TS - Dredge GSC-PGC – Luternauer QueensU – Gilbert COGLA - Hale

WHOI - Milliman

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UOslo -Elverhoi

**COLDSEIS** 

U. Bergen – Aarseth Penn. State - Alley

INSTAAR - Andrews, Jennings Rice U – Anderson

UTexas at Austin - Austin, Davies, Lagoe RutgersU - Ashley

USGS - Barnes, Carlson, Cooper, Hampton, Molnia

Victoria U Wellington - Barrett, Henrys

Norsk Hydro - Nyland Berg Moscow State University - Danilov U Edinburgh - Boulton, Praeg

Hamilton College – Domack Scott Polar Research Institute - Dowdeswell

Byrd Polar Research Centre - Forman U Oslo Elverhoi

UToronto - Gipp Norsk Polar Institute - Forsberg, Solheim

Liverpool Polytechnic - Hambrey QueensU – Gilbert

BGS - Holmes, Stoker, Wingfield ONR - Kravitz University of Wales - Kidd Geological Survey of Denmark - Larsen

British Antarctic Survey – Larter UConnecticut - Lewis UNew Bruswick - Mayer GEOMAR - Meinert

UIllinois at Chicago Circle - Philips, Smith Northern Illinois U - Stravers, Powell Hi-Res Geoservice – Stewart Marine Research Institute, Iceland - Thors

UTromso - Vorren UAberystwyth- Whittington

## Reservoir (HydroCarbon) MODELLING

Marathon Oil - Ross, Watts

Texaco Oil - Matthews, Perlmuetter;

Mobil Oil – Sarg, Gouvies, Deutsch, Cullick

ExxonMobil — Jones, Gosslin, Sarg, Patterson, Sun

#### **STRATAFORM**

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