G. Peter van Walsum, Ph.D., P.E., P.Eng.

Associate Professor
Forest Bioproducts Research Initiative
Department of Chemical and Biological Engineering
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EDUCATION

Ph.D.	Biochemical Engineering Thayer School of Engineering, Dartmouth College, Hanover, NH.	1998
M.Eng.	Chemical Engineering McGill University, Montreal, PQ, Canada.	1992
B.Eng.	Chemical Engineering, With Distinction McGill University, Montreal, PQ, Canada.	1988
B.A.	Geology, Cum Laude Williams College, Williamstown, MA.	1985

ACADEMIC AND ENGINEERING EXPERIENCE

Associate Professor Fall 2007 - present
Department of Chemical and Biological Engineering
University of Maine, Orono, ME

- Recruited to lead the bioconversion component of the **>$10MM** NSF EPSCoR Forest Bioproducts Research Initiative (FBRI).
- Initiating a leading research activity in bioconversion of forest-, agriculture- and marine-derived biomass feedstocks for production of sustainable fuels and chemicals. Awarded **>$1MM** in external funding the first year.
- Promoting technology transfer through research & development collaboration with industrial partners.

Process Engineering Group Leader Summer 2007
Kearl Oil Sands Project (Client: Imperial Oil/ ExxonMobil)
AMEC Americas, Calgary, AB, Canada

- Supervised a group of six process engineers in froth treatment design group.
- Raised team morale and accelerated group productivity amid high stress schedule requirements.
- Presented PFDs and P&IDs for client review, effectively facilitated the client/EPC interface.

Associate Professor and Director of Graduate Studies 2005 - 2007
Assistant Professor 1998 - 2004
Department of Environmental Studies and Glasscock Energy Research Center
Baylor University, Waco TX

- Recruited to revitalize the science and engineering research in the department.
- Led relocation to new building and laboratory facilities, designed floor plan, set up labs,

- Led and participated in two year-long search committees for new faculty and department chair.
- Initiated a nationally-recognized research program which attracted >**$1.2MM** in external funding.
- Completed seven externally funded research grants and contracts on budget and on schedule.
- Spearheaded departmental research improvement **from $50k to over $750k/yr** in external funding.
- Increased college support for graduate researchers **by 43% over two years.**
- Greatly surpassed expectations by developing a leading research program in a Masters-level department.

Research Engineer 1998

Thayer School of Engineering, Dartmouth College, Hanover, NH

- Addressed learning curve for future bio-refineries, applying multiple emerging technologies in a comprehensive ASPEN-Plus Biorefinery process model.

Doctoral Research Associate in Biochemical Engineering 1993-1998

Thayer School of Engineering, Dartmouth College, Hanover, NH

"Consolidated Bioprocessing and Liquid Hot Water Pretreatment for Conversion of Lignocellulosic Materials to Ethanol."

- Conducted leading studies on thermophillic consolidated bioprocessing, conversion of paper mill sludges to ethanol and biomass pretreatment.
- Developed and programmed a first-of-a-kind metabolic model of cellulose-utilizing fermentation.

Masters Research Associate in Chemical Engineering 1990-1992

Chemical Engineering Department, McGill University, Montreal, PQ

"Self Cycling Fermentation in a Stirred Tank Reactor."

- Increased fermentation productivity by an order of magnitude by designing and demonstrating the use of a computer-controlled sequencing batch fermentation system.

Instrumentation Engineer 1988-1990

Shell Canada Products Limited, Montreal East Refinery, Montreal, PQ.

- Improved plant reliability and operation stability through instrument system upgrades and technical support (Temperature, flow, level, pressure, PLC, compressor surge, lock-up systems, valves, etc.)
- Project-managed (designed, procured, installed and commissioned) new instrumentation and on-line analyzer systems for heavy oil (asphalt, crude, lube) unit operations, including refractive index, pour-point, viscosity, O_2, pH, and color analyzers.

AFFILIATIONS AND LICENSES

P.E. Licence in State of Texas.
American Institute of Chemical Engineering
Canadian Society of Chemical Engineers
Association of Energy Engineers
P. Eng. license Province of Alberta
American Chemical Society.
Chemical Institute of Canada

PROFESSIONAL CONSULTING

Advisory board, StarRotor Corporation, College Station, TX. (Advanced compressors and engines)
Advisory board, Terrabon LLC, Bryan, TX. (Fuels and chemicals from biomass)
Professional engineer consulting on Biocommodity, Energy and Chemical Engineering

PEER-REVIEWED PUBLICATIONS

Du, Bowen, Sharma, Lekh N. Chambliss, C. Kevin and van Walsum, G. Peter. "Effect of pH, temperature and reaction time on the accumulation of degradation products resulting from pretreatment of biomass," Manuscript in preparation for submission to *Biotechnology and Bioengineering*

Um, Byung, van Walsum, G. Peter. Mass Balance on the Pulping Extraction of Northeast Mixed Hardwood using High Performance Liquid Chromatography and High Performance Anion Exchange Chromatography. Submitted to *Bioresource Technology.*

Sara Walton, Adriaan van Heiningen, Peter van Walsum. Inhibition effects on fermentation of hardwood extracted hemicelluloses by acetic acid and sodium. Submitted to *Bioresource Technology.*

18. Sara Walton, G. Peter van Walsum, Adriaan van Heiningen, Fermentation of Near-Neutral pH Extracted Hemicellulose Derived from Northern Hardwood. Accepted to the peer-reviewed proceedings of the 8th World Congress on Chemical Engineering. Montreal, August 23-27, 2009

17. Um, Byung-Hwan, van Walsum, G. Peter. 2009. Acid Hydrolysis of Hemicellulose in Green Liquor Pre-Pulping Extract of Mixed Northern Hardwoods. *Applied Biochemistry and Biotechnology,* **153**, 1: 127-139**.**

16. Blackman, Erin, D., van Walsum, G. Peter. 2009. Production of Renewable Fuels and Bioproducts and Reduction of Phosphate Pollution Through the Lime Pretreatment and Acidogenic Digestion of Dairy Manure. *Environmental Progress & Sustainable Energy* **28**:1 April 121-133.

15. Nichols, Nancy N., Sharma, Lekh N., Mowery, Richard A., Chambliss, C. Kevin, van Walsum, G. Peter, Dien, Bruce S., Iten, Loren B.,2008. Fungal Metabolism of Pretreatment Side-Products Present in Corn Stover Dilute Acid Hydrolysate. *Enzyme and Microbial Technology,* **42**, 624-630.

14. Shou-Feng Chen, Richard Mowery, C. Kevin Chambliss, G. Peter van Walsum. 2007. "Pseudo Reaction Kinetics of Organic Degradation Products in Dilute-Acid-Catalyzed Corn Stover Pretreatment Hydrolysates." *Biotechnology and Bioengineering*, **98,** 6: 1135 – 1145.

13. G. Peter van Walsum, Maurilio Garcia-Gil, Shou-Feng Chen, Kevin Chambliss., 2007. Effect of Dissolved Carbon Dioxide on Accumulation of Organic Acids in Liquid Hot Water Pretreated Biomass Hydrolysates. *Applied Biochemistry and Biotechnology, **136-140**:301-311*.

12. Chen, S.-F.; Mowery, R. A.; Castleberry, V. A.; van Walsum, G. P.; Chambliss, C. K., 2006 "High performance liquid chromatography method for simultaneous determination of aliphatic acid, aromatic acid and neutral degradation products in biomass pretreatment hydrolysates," *J. Chrom. A.*, **1104**: 54-61.

11. A. Coté, W. A. Brown, D, Cameron, G. P. van Walsum, 2004. Hydrolysis of lactose in whey permeate for subsequent fermentation to ethanol. *Journal of Dairy Science,* **87**: 6, 1608-1620.

10. Kemantha Jayawardhana, G. Peter van Walsum. 2004 Modeling of Carbonic Acid Pretreatment Process Using ASPEN-Plus. *Applied Biochemistry and Biotechnology,* **115**(1-3) 1087-1102

9. Damon Yourchisin, G. Peter van Walsum, 2004 Comparison of the Microbial Inhibition and Enzymatic Hydrolysis Rates of Liquid and Solid Hydrolysates Produced from Pretreatment of Biomass with Carbonic Acid and Liquid Hot Water. *Applied Biochemistry and Biotechnology,* **115**(1-3) 1073-1086

8. G. Peter van Walsum, Helen Shi, 2004. Carbonic Acid Enhancement of Hydrolysis in Aqueous Pretreatment of Corn Stover. *Bioresource Technology,* **93**:3, 217-226

7. Z. Fan, C. South, K. Lyford, J. Munsie, P. van Walsum, and L.R. Lynd, 2003. Conversion of paper sludge to ethanol in a semincontinous solids-fed bioreactor. *Bioprocess and Biosystems Engineering* **26**: (2) 93-101.

6. Robert C. McWilliams, G. Peter van Walsum, 2002. Comparison of Aspen Wood Hydrolysates Produced by Pretreatment with Liquid Hot Water and Carbonic Acid. *Applied Biochemistry and Biotechnology* **98-100:**109-121.

5. G. Peter van Walsum, 2001. Severity Function Describing the Hydrolysis of Xylan using Carbonic Acid. *Applied Biochemistry and Biotechnology*. **91-93:**317-329.

4. Lee R. Lynd, Kimberly Lyford, Colin R. South, G. Peter van Walsum, Keith Levenson, 2001. Evaluation of paper sludges for amenability to enzymatic hydrolysis and conversion to ethanol. TAPPI J. **84:**2, 50.

3. G. Peter van Walsum, Lee R. Lynd, 1998. Allocation of ATP to Synthesis of Cells and Hydrolytic Enzymes in Cellulosic Fermentative Microorganisms: Bioenergetics, Kinetics, and Bioprocessing. *Biotechnology and Bioengineering*, **58:** 2-3, 316-320.

2. G. Peter van Walsum, Stephen. G. Allen, Mark. S. Laser, Mark. J. Spencer, Michael. J. Antal Jr., Lee. R. Lynd, 1996. Conversion of Lignocellulosics Pretreated with Hot Compressed Liquid Water to Ethanol. *Applied Biochemistry and Biotechnology* **57/58**:157-170

1. G. Peter van Walsum, David G. Cooper 1993. Self-Cycling Fermentation (SCF) in a Stirred Tank Reactor. *Biotechnology and Bioengineering* **42:** 1175-1180

OTHER TECHNICAL PUBLICATIONS

12 Stephen Shaler, Michael Biolodeau, Robert J. Lilieholm, G. Peter van Walsum. February 2009. The meaning of a changing environment: sector issues and opportunities – Forest products in: Maine's Climate Future: An Initial Assessment. Report to the State of Maine office of the Governor. pp. 43-47.

11. G. Peter van Walsum , Michael Flatt, Erin Doyle, Reddy Adapala, In-situ Bioconversion of waste biomass to organic acids for production of alcohol fuels via the MixAlco Process. Conference proceedings for Energex 2006, June 12 – 15 2006, Stavanger, Norway.

10. G. Peter Van Walsum, Michael Flatt, Erin Doyle and Reddy Adapala, Application of the Mixalco Process to in-Situ Conversion of Dairy Manure and Chipped Yard Waste for Production of Fuels and Chemicals. Conference proceedings of the AIChE annual meeting, Cincinnati, OH, Oct. 30 – Nov 4, 2005. Paper # 279e, 14 pages.

9. Shou-Feng Chen, Richard A. Mowery, G. Peter van Walsum, and C. Kevin Chambliss Identification and Quantitation of Organic Degradation Products in Dilute-Acid-Catalyzed Corn Stover Pretreatment Hydrolysates. Conference proceedings of the AIChE annual meeting, Cincinnati, OH, Oct. 30 – Nov 4., 2005. Paper # 371e, 19 pages.

8. G. Peter van Walsum, Kemantha Jayawardhana, Damon Yourchisin, Robert McWilliams, Vanessa Castleberry, 2003. Carbonic Acid Pretreatment of Biomass. Final Report to DOE contract DE-FC36-01GO11070, A000.

7. G. Peter van Walsum, Robert McWilliams, Helen Shi, 2002. Analysis of Carbonic Acid Pretreatment Hydrolysates Derived From Aspen Wood and Corn Stover. Proceedings of the 12th European Conference and Technology Exhibition on Biomass for Energy, Industry and Climate Protection. Amsterdam, NL, 17-21 June 2002. p 809-812.

6. G. Peter van Walsum, Sean Casten, Lee R. Lynd 1999. Design, Analysis, and Evaluation of Advanced Ethanol Production Technology with Comparison to Other Alternative Fuels Subcontract. Report to NREL on sub-contract No. XCG-8-18024-01Under Prime Contract No. DE-AC36-83CH10093

5. G. Peter van Walsum, Sean Casten, Lee R. Lynd, 1997. Demonstration of Direct Microbial Processing. Final Report for NREL extension to sub-contract XAC-5-15162-01.

4. Sunitha Baskaran, G. Peter van Walsum, Lee R. Lynd. 1996. Demonstration of Direct Microbial Processing. Final Report for NREL sub-contract XAC-5-15162-01.

3. G. Peter van Walsum, 1996. Thermophilic Conversion of Paper Sludge to Ethanol. Research Reports of the Link Energy Fellows, **11:**95-115

2. G. Peter van Walsum, 1994. Status Report on Conversion of Paper Sludges to Ethanol. Submitted to NREL under sub-contract RE-2-13005-1.

1. G. Peter van Walsum, 1993. White paper from workshop on the Commercialization of Biomass Conversion Technology in New York. Cornell University, Ithaca, NY October 12 and 13, 1993. Submitted to New York State Energy Research and Development Authority

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NATIONAL, INTERNATIONAL AND INVITED PRESENTATIONS

71. G. Peter van Walsum. Modification of a Hardwood Pulp Mill into an Integrated Forest Biorefinery. NSERC Environmental Design Engineering Chair Seminar, Ecole Polytechnique, University of Montreal, Montreal, Quebec, Canada. Dec 1, 2008.

70. G. Peter van Walsum. Biorefinery Research at the University of Maine. Invited presentation to Thayer School of Engineering and Mascoma Inc. Dartmouth College, June 13, 2008.

69. Bowen Du, Lekh Sharma, Peter van Walsum, Kevin Chambliss. Effect of varying feedstock-pretreatment chemistry combinations on the production of potentially inhibitory degradation products in biomass hydrolysates. 30th Symposium on Biotechnology for Fuels and Chemicals, New Orleans, May 2008.

68. Byung Um, G. Peter van Walsum. Evaluation of Acid and Enzymatic Hydrolysis of Hemicellulose Extracts Produced from Northeast Hardwood. 30th Symposium on Biotechnology for Fuels and Chemicals, New Orleans, May 2008.

67. Sara Walton, Adriaan van Heiningen, G. Peter van Walsum. Fermentation of hardwood-derived hemicellulose pulp mill extract to ethanol using *E.coli* KO11. 30th Symposium on Biotechnology for Fuels and Chemicals, New Orleans, May 2008.

66. Parag Shah, G. Peter van Walsum.Process Modeling And Economic Evaluation Of Mix Alco Process To Produce Various C2 To C7 Chemicals. AIChE National Meeting, Salt Lake City, UT, November 2007.

65. Nancy N. Nichols, C. Kevin Chambliss, Lekh Nath Sharma, G. Peter van Walsum, and Bruce S. Dien. Removal of inhibitors from biomass sugars using a biological process. 29th Symposium on Biotechnology for Fuels and Chemicals, Denver CO. May 2007.

64. Lekh Nath Sharma, Bowen Du, G. Peter van Walsum, C. Kevin Chambliss. Kinetic study on the Release and Accumulation of Degradation Products Resulting from Dilute Acid Pretreatment of Poplar and Corn Stover. 29th Symposium on Biotechnology for Fuels and Chemicals, Denver CO. May 2007.

63. Bowen Du, Lekh Nath Sharma, C. Kevin Chambliss, G. Peter van Walsum. Quantitation of Organic Degradation Products Resulting from Varying Pretreatment Chemistry Applied to Poplar and Corn Stover. 29th Symposium on Biotechnology for Fuels and Chemicals, Denver CO. May 2007.

62. Bowen Du, Lekh Nath Sharma, C. Kevin Chambliss, G. Peter van Walsum. Quantitation of Organic Degradation Products Resulting from Varying Solids Concentration in Dilute Acid pretreatment of Poplar and Corn Stover. 29th Symposium on Biotechnology for Fuels and Chemicals, Denver CO. May 2007.

61. G. Peter van Walsum. Adding value to hemicellulose extracts: Comparison of alternate processing paradigms. Presented to the department of Chemical and Biological Engineering, University of Maine, April 2007,

60. Lekh N. Sharma, Bowen Du, Shou-Feng Chen, Richard Mowery, G. Peter van Walsum, and C. Kevin Chambliss. HPLC-UV/Vis-MS/MS Identification and Quantitation of Organic Degradation Products in Biomass Pretreatment Hydrolysates. World Congress on Industrial Biotechnology. Orlando, FL, March 2007.

58. Nancy N. Nichols, C. Kevin Chambliss, G. Peter van Walsum, and Bruce S. Dien. Biological abatement for removal of inhibitors from biomass sugars. American Chemical Society, Spring meeting 2007.

57. Lekh N. Sharma, Chris Becker, Richard Mowery, G. Peter Van Walsum, Kevin Chambliss. Identification and Quantitation of Organic Degradation Products in Dilute-Acid-Catalyzed Corn Stover Pretreatment Hydrolysates by HPLC-UV-MS/MS method. AIChE annual meeting, San Francisco, CA. Nov 19-24, 2006.

56. Shou-Feng Chen, Richard A. Mowery, C. Kevin Chambliss, G. Peter van Walsum. Identification of Quantitation of Water Extractives in Corn Stover. 28th Symposium on Biotechnology for Fuels and Chemicals. Nashville, TN, April 30 – May 3, 2006.

55. Erin Doyle, G. Peter van Walsum. Comparisson of methanogenic and acidogenic digestion of cattle manure for production of fuels and reduction of phosphorous bioavailability. 28th Symposium on Biotechnology for Fuels and Chemicals. Nashville, TN, April 30 – May 3, 2006.

54. Michael Flatt, G. Peter van Walsum. On-site Lime Pretreatment and Acidogenic Digestion of Dairy Manure Employing Counter-Current Fermentation with Minimal Solids Handling. 28th Symposium on Biotechnology for Fuels and Chemicals. Nashville, TN, April 30 – May 3, 2006.

53. G. Peter van Walsum, Shou-Feng Chen, Richard A. Mowery, C. Kevin Chambliss. Quantitation of Organic Degradation Products in Response to Severity of Dilute Acid Pretreatment of Corn Stover. 28th Symposium on Biotechnology for Fuels and Chemicals. Nashville, TN, April 30 – May 3, 2006.

52. Maurilio Garcia-Gill, G. Peter van Walsum, Effect of Dissolved Carbon Dioxide on Accumulation of Organic Acids in Liquid Hot Water Pretreated Biomass Hydrolysates. 28th Symposium on Biotechnology for Fuels and Chemicals. Nashville, TN, April 30 – May 3, 2006.

51. Kerry O'Bric, Shou-Feng Chen, C. Kevin Chambliss, G. Peter van Walsum. Analysis of modes of detoxification of dilute acid pretreatment hydrolysate by ion exchange and overliming treatments. 28th Symposium on Biotechnology for Fuels and Chemicals. Nashville, TN, April 30 – May 3, 2006.

50. Reddy Adapala, G. Peter van Walsum. Pretreatment and Bioconversion of Chipped Yard Waste to Carboxylic Acids using a Percolation Column Apparatus. 28th Symposium on Biotechnology for Fuels and Chemicals. Nashville, TN, April 30 – May 3, 2006.

49. G. Peter Van Walsum, Michael Flatt, Erin Doyle and Reddy Adapala, Application of the Mixalco Process to in-Situ Conversion of Dairy Manure and Chipped Yard Waste for Production of Fuels and Chemicals. AIChE annual meeting, Cincinnati, OH, Oct. 30 – Nov 4, 2005.

48. Shou-Feng Chen, Richard A. Mowery, G. Peter van Walsum, and C. Kevin Chambliss Identification and Quantitation of Organic Degradation Products in Dilute-Acid-Catalyzed Corn Stover Pretreatment Hydrolysates. AIChE annual meeting, Cincinnati, OH, Oct. 30 – Nov 4, 2005.

47. G. Peter van Walsum, Michael Flatt, Erin Doyle, Reddy Adapala, Bennet Lane, Dayo Fadelu, Rene Massengale. Application of the MixAlco Process to In-Situ Conversion of Agricultural and Municipal Wastes for Production of Fuels and Chemicals. 27th Symposium on Biotechnology for Fuels and Chemicals, Denver, CO. May 1-4, 2005.

46. Erin Doyle, G. Peter van Walsum. Closure of the Phosphate Balance in the Conversion of Lime-Pretreated Dairy Manure to Mixed Acids. 27th Symposium on Biotechnology for Fuels and Chemicals, Denver, CO. May 1-4, 2005.

45. Michael Flatt, G. Peter van Walsum. On-site Lime Pretreatment and Conversion of Dairy Manure to Mixed Acids for the Production of Chemical Feedstocks via the MixAlco Process. 27th Symposium on Biotechnology for Fuels and Chemicals, Denver, CO. May 1-4, 2005.

44. Reddy Adapala, G. Peter van Walsum. Operation of a Percolation Column Apparatus for Oxidative Lime Pretreatment and Solid State Conversion of Chipped Yard Waste to Carboxylic Acids. 27th Symposium on Biotechnology for Fuels and Chemicals, Denver, CO. May 1-4, 2005.

43. Shou-Feng Chen, Richard A. Mowery, Melinka Arispe-Angulo, Vanessa A. Castleberry, G. Peter van Walsum, and C. Kevin Chambliss. Identification and Quantitation of Organic Degradation Products in Dilute-Acid-Catalyzed Corn Stover Pretreatment Hydrolysates. 27th Symposium on Biotechnology for Fuels and Chemicals, Denver, CO. May 1-4, 2005.

42. G. Peter van Walsum Towards a Diagnostic Assessment of Microbial Inhibition in Bioconversion of Lignocellulose to Fuels and Chemicals. University of Minnesota Research Colloquium. April 14, 2005.

41. Erin Doyle, G. Peter van Walsum, Bryan W. Brooks**.** Ultimate fate of phosphate in counter-current acidogenic MixAlco fermentation of lime-pretreated cattle manure. 26th Symposium on Biotechnology for Fuel and Chemicals in Chatanooga, TN, May 9 – 12, 2004.

40. Michael Flatt, G. Peter van Walsum, Erin Doyle, Rene D. Massengale. On-site acidogenic fermentation of cattle manure for production of chemical feedstocks via the MixAlco process. 26th Symposium on Biotechnology for Fuel and Chemicals in Chatanooga, TN, May 9 – 12, 2004.

39. Reddy Adapala, G. Peter van Walsum. Percolation column apparatus for investigation of solid state conversion of chipped yard waste to carboxylic acids through the MixAlco process. 26th Symposium on Biotechnology for Fuel and Chemicals in Chatanooga, TN, May 9 – 12, 2004.

38. Vanessa Castleberry, G. Peter van Walsum, C. Kevin Chambliss, Shou-Feng Chen, Richard A. Mowrey.Improved analytical methods for analysis of carbohydrate monomers and oligomers in dilute-acid pretreated biomass. 26th Symposium on Biotechnology for Fuel and Chemicals in Chatanooga, TN, May 9 – 12, 2004.

37. G. Peter van Walsum, Dayo Fadelu, Erin Doyle, Rene D. Massengale. Biolog characterization of microbial cultures in acidogenic fermentation of lime-pretreated cattle manure. 26th Symposium on Biotechnology for Fuel and Chemicals in Chatanooga, TN, May 9 – 12, 2004.

36. Shou-Feng Chen, Richard A. Mowrey, Vanessa A. Castleberry, G. Peter van Walsum, C. Kevin Chambliss. HPLC-MS Analysis of Organic Acids & Phenols in Biomass Pretreatment Hydrolysates 26th Symposium on Biotechnology for Fuel and Chemicals in Chatanooga, TN, May 9 – 12, 2004.

35. Kerry L. O'Bric, Vanessa A. Castleberry, Shou-Feng Chen, Rene D. Massengale, G. Peter van Walsum, C. Kevin Chambliss. Comparison of Commercially Available Ion Exchangers for Detoxification of Corn Stover Hydrolysates. Accepted to the 26th Symposium on Biotechnology for Fuel and Chemicals in Chatanooga, TN, May 9 – 12, 2004.

34. G. Peter van Walsum, Michael Flatt, Erin Doyle. On-site acidogenic fermentation of cattle manure for production of chemical feedstocks via the MixAlco process. ACS Symposium Feedstocks for the Future: Renewables for the Production of Chemicals and Materials, ACS annual meetin, Anaheim, CA, March 28 – April 1, 2004.

33. G. Peter van Walsum, Erin Doyle. Improving the economic incentive for effective manure treatment:

Removal of phosphate through MixAlco conversion of dairy cattle manure to value-added fuels and chemicals. Accepted for presentation at:Water for a Sustainable and Secure Future, 4th National Conference on Science, Policy and the Environment in Washington, DC, January 29-30, 2004.

32. Kemantha Jayawardhana, G. Peter van Walsum. Modeling of Carbonic Acid Pretreatment Process Using ASPEN-Plus. 25th Annual Symposium on Biotechnology for Fuels and Chemicals. Breckenridge, CO, May 4 – 8, 2003.

31. Kemantha Jayawardhana, G. Peter van Walsum. Modeling of Biomass Conversion to Mixed Alcohol Fuels (MixAlco Process) Using ASPEN-Plus. 25th Annual Symposium on Biotechnology for Fuels and Chemicals. Breckenridge, CO, May 4 – 8, 2003.

30. Damon Yourchisin, G. Peter van Walsum. Comparison of the Microbial Inhibition and Enzymatic Hydrolysis Rates of Liquid and Solid Hydrolysates Produced from Pretreatment of Biomass with Carbonic Acid and Liquid Hot Water. 25th Annual Symposium on Biotechnology for Fuels and Chemicals. Breckenridge, CO, May 4 – 8, 2003.

29. G. Peter van Walsum, Rene D. Massengale. Characterization of Microbial Populations in Non-Sterile Acidogenic Fermentations. Big-12 Faculty Fellowship invitational presentation to the Chemical Engineering Department, Texas A&M University. December 16, 2002.

28. Kemantha Jayawardhana, G. Peter van Walsum. Modeling the MixAlco Process Using Aspen-Plus. Big-12 Faculty Fellowship invitational presentation to the Chemical Engineering Department, Texas A&M University. December 16, 2002.

27. G. Peter van Walsum, Robert McWilliams, Helen Shi, Vanessa Castleberry, Damon Yourchisin, Kemantha Jayawardhana, John Lam. Evaluation of Carbonic Acid Pretreatment of Biomass. 12th European Biomass Conference and Technology Exhibition on Biomass for Energy, Industry and Climate Protection, Amsterdam, NL, June 17-21, 2002.

26. G. Peter van Walsum, Robert McWilliams, Damon Yourchisin, Helen Shi. Evaluation of Carbonic Acid Pretreatment of Biomass. 24th Annual Symposium on Biotechnology for Fuels and Chemicals, Gatlinburg TN. April 28- May 2, 2002

25. Zhiliang Fan, Colin South, Kimberly Lyford, Jeffrey Munsie, Mateusz M. Nowak, Peter van Walsum, Lee R. Lynd. Conversion of Paper Sludge to Ethanol in a Novel Semi-continuous Solids-fed Reactor System Capable of Metered Aseptic Delivery of Solid Substrates. 24th Annual Symposium on Biotechnology for Fuels and Chemicals, Gatlinburg TN. April 28- May 2, 2002

24. Robert McWilliams, G. Peter van Walsum. Effects of Carbonic Acid on Endogenous Acid Accumulation in Pretreatment Hydrolysates. 24th Annual Symposium on Biotechnology for Fuels and Chemicals, Gatlinburg TN. April 28- May 2, 2002

23. Kemantha Jayawardhana, G. Peter van Walsum. Modeling of Carbonic Acid Pretreatment Process Using Aspen Plus. 24th Annual Symposium on Biotechnology for Fuels and Chemicals, Gatlinburg TN. April 28- May 2, 2002

22. Vanessa Castleberry, G. Peter van Walsum. Thermodynamic Evaluation of Carbonic Acid Pretreatment of Biomass 24th Annual Symposium on Biotechnology for Fuels and Chemicals, Gatlinburg TN. April 28- May 2, 2002

21. Damon Yourchisin, G. Peter van Walsum. Determination of the Microbial Inhibition and Enzymatic Hydrolysis Rates of Carbonic Acid Pretreated Aspen Wood. 24th Annual Symposium on Biotechnology for Fuels and Chemicals, Gatlinburg TN. April 28- May 2, 2002

20. G. Peter van Walsum, Robert McWilliams, Helen Shi, Vanessa Castleberry. Evaluation of Carbonic Acid Pretreatment of Biomass. American Chemical Society National Meeting, Orlando, FL. April 7–11, 2002.

19. G. Peter van Walsum. Transient Emergence of Waste Elimination Processes: the Development of Natural and Engineered Closed-Loop Material Flows. Conference on Ecology, Theology and Judeo-Christian Environmental Ethics, University of Notre Dame, February 21-24, 2002.

18. Annie Coté, Wayne A. Brown, G. Peter van Walsum: Hydrolysis of Lactose and Lactoserum Using Hot Compressed Carbonic Acid. Presented at the Annual meeting of the Canadian Society of Chemical Engineers, Halifax NS, October, 2001

17. G. Peter van Walsum, Comparison of Carbon Dioxide and Sulfur Dioxide For Acid-Catalyzed Steam Explosion of Biomass: a Thermodynamic Investigation. Sixth International Conference on Carbon Dioxide Utilisation (ICCDU VI), Breckenridge, CO. Sept 10 –14, 2001

16. Robert McWilliams, G. Peter van Walsum, Comparison of Aspen Wood Hydrolysates Produced by Pretreatment with Liquid Hot Water and Carbonic Acid. 23rd Symposium on Biotechnology for Fuels and Chemicals, Breckenridge, CO. May 6-9, 2001

15. Haiming Jin, Sean Casten, Peter van Walsum, Lee H. Lynd, Advanced Technology for Ethanol and Power Coproduction from Biomass: Evaluation of Advanced Power Generation Alternatives and Design of Integrated Processes using ASPEN. 23rd Symposium on Biotechnology for Fuels and Chemicals, Breckenridge, CO. May 6-9, 2001

14. G. Peter van Walsum. Carbonic Acid Pretreatment—An Opportunity for Closing the Loop in Biocommodity Engineering. Presented to the Department of Chemical Engineering, McGill University, Montreal, Quebec, Canada. March 29, 2001.

13. G. Peter van Walsum, Use of Carbonic Acid for Hydrolysis of Xylan. 22nd Symposium on Biotechnology for Fuels and Chemicals, Gatlinburg, TN. May 7-11, 2000.

12. G. Peter van Walsum + Lee R. Lynd, Evaluation of Mature Biomass Ethanol Technology Using an Aspen Plus Process Model. 22nd Symposium on Biotechnology for Fuels and Chemicals, Gatlinburg, TN. May 7-11, 2000

11. L.R. Lynd, C. E. Wyman, T. U. Gerngross, G. P. van Walsum, S. Casten. Use of process analysis to evaluate economics, research priorities, and life-cycle impacts for biomass processing. ACS National Meeting, San Francisco, CA. March 26-30, 2000.

10. G. Peter van Walsum, Sean Casten, Lee R. Lynd. Design, Analysis, and Evaluation of Advanced Ethanol Production Technology. Presented to the National Renewable Energy Laboratory, Golden, CO. February 1999.

9. Lee R. Lynd, Colin R. South, Kimberly Lyford, Keith Levenson, G. Peter van Walsum, Conversion of Paper Sludge to Ethanol. 20th Symposium on Biotechnology for Production of Fuels and Chemicals.Gatlinburg TN. May 1998.

8. G. Peter van Walsum, Advancing Technologies for Biomass Processing: Liquid Hot Water Pretreatment and Consolidated Bioprocessing. Presented to Cargill Inc., Minneapolis, MN. March 1998.

7. G. Peter van Walsum, Consolidated Bioprocessing of Lignocellulosic Substrates to Ethanol. Presented to Iogen Corporation, Ottawa, Ontario. February 1998.

6. Lee R. Lynd, Colin R. South, Kimberly Lyford, Keith Levenson, G. Peter van Walsum, Sean Casten, Kathryn Miller, Daniel Mazzucco. Conversion of Paper Sludges to Ethanol. Green Chemistry and Engineering Conference: Implementing Vision 2020 for the Environment. Washington, D.C., June 23-34, 1997.

5. Lee R. Lynd, Colin R South, G. Peter van Walsum. Bioprocessing for Large Scale Production of Plant Based Products. Biochemical Engineering X Engineering Foundation Conference, Kananaskis, B.C. May 1997.

4. G. Peter van Walsum, Lee R. Lynd, Allocation of ATP to Synthesis of Cells and Hydrolytic Enzymes in Cellulosic Fermentative Microorganisms: Bioenergetics, Kinetics, and Bioprocessing. Engineering Fundamentals Conference, Danvers, MA. November 1996.

3. Lee R. Lynd, G. Peter van Walsum, Sean T. Casten, Ethanol Production using thermophilic bacteria: pathway engineering and fermentation studies. AIChE Annual Meeting, Chicago, IL. November 1996.

2. G. Peter. van Walsum, Stephen. G. Allen, Mark. S. Laser, Mark. J. Spencer, Michael. J. Antal Jr., Lee. R. Lynd. Conversion of Lignocellulosics Pretreated with Hot Compressed Liquid Water to Ethanol. 17th Symposium on Biotechnology for Production of Fuels and Chemicals. Aspen CO. May 1995.

1. G. Peter van Walsum, David G. Cooper. Self-Cycling Fermentation (SCF) in a Stirred Tank Reactor. First prize student presentation at the Annual meeting of the Canadian Society of Chemical Engineers, Montreal, PQ. September 1992.

REGIONAL AND LOCAL PRESENTATIONS

27. G. Peter van Walsum. Bioconversion Research in the FBRI. AAAS-NSF EPSCoR Review meeting. University of Maine, October 30, 2008.

26. Byung-Hwan Um, G. Peter van Walsum, Evaluation of Acid and Enzymatic Hydrolysis of Hemicellulose Extracts Produced from Northeast Hardwood. 1st Annual Conference on Cellulosic Biofuels. U. Mass Amherst, Sept 19 2008.

25. Sara Walton, G. Peter van Walsum, Adriaan van Heiningen, Fermentation of Near-Neutral pH Extracted Hemicellulose Derived from Northern Hardwood. 1st Annual Conference on Cellulosic Biofuels. U. Mass Amherst, Sept 19 2008.

24. Lekh N. Sharma, Bowen Du, G. Peter van Walsum and C. Kevin Chambliss, Identification and Quantitation of Potential Fermentation Inhibitors Resulting from Chemical Pretreatment of Lignocellulosic Biomass. 64th SW Regional Meeting ACS conference.

23. G. Peter van Walsum. Biocommodities and Biorefining. Presentation to project Learning Tree, University of Maine, August 12, 2008.

22. G. Peter van Walsum. Biorefinery Research at the University of Maine. NCASI North Eastern regional meeting, May 21, Auburn, ME. 2008.

21. G. Peter van Walsum Biomass Fermentation Paradigms. Presented to U. Maine FBRI Biofuels workshop, Jan 10, 2008.

20. G. Peter van Walsum. Energy: Where have we been and where are we going? Presented in the town of Dover, ME. December 12, 2007.

19. G. Peter van Walsum. Value and Sustainability from Biological Resources. Research Presentation to Department of Chemical and Biological Engineering, University of Maine, Dec 7, 2007.

18. G. Peter van Walsum. Biomass Conversion Technology Development. Growing Maine's Green Economy: Technology Development Panel. University of Southern Maine, October 26, 2007.

17. G. Peter van Walsum Bioprocessing Research. NSF EPSCoR Review meeting, U. of Maine, October 17, 2007.

16. Lekh N. Sharma, Bowen Du, Shou-Feng Chen, Richard Mowery, G. Peter van Walsum, and C. Kevin Chambliss. Characterization of Accumulation Trends for Carbohydrate, Lignin, and Extractive Degradation Products in Lignocellulose Pretreatment. USDA NRI PD meeting, Washington DC. March 2007.

15. G. Peter van Walsum Enhanced Ethanol Yields from Sorghum and Other Sweet Cellulosic Feedstocks. Big 12 Innovation and Capital Formation Conference. March 1, 2007.

14. G. Peter van Walsum. Humans, Energy and the Environment: Where have we been and where are we going? Presented to St Paul's Church Christian Education. February 2007.

13. G. Peter van Walsum. Production of Fuels and Chemicals from Fiber. Presented to the Dallas Agricultural Club, Dallas, TX, February 6, 2006.

12. G. Peter van Walsum, Michael Flatt, Erin Doyle. Assessment of On-Site Treatment and Conversion of Dairy Effluent to Marketable Products via the MixAlco process. SETAC South Central Regional Meeting, Baylor University, Waco TX. May 21-22 2004.

11. Vanessa Castleberry, G. Peter van Walsum, C. Kevin Chambliss, Shou-Feng Chen, Richard A. Mowrey. Improved analytical methods for analysis of carbohydrate monomers and oligomers in dilute-acid pretreated biomass. Baylor University Scholars day, March 8, 2004.

10. Michael Flatt, G. Peter van Walsum, Erin Doyle. On-site acidogenic fermentation of cattle manure for production of chemical feedstocks via the MixAlco process. Baylor University Scholars day, March 8, 2004.

9. Erin Doyle, G. Peter van Walsum, Bryan W. Broooks. Ultimate fate of phosphate in acidogenic MixAlco fermentation of lime-pretreated cattle manure. University Scholars day, March 8, 2004.

8. Damon Youchisin, G. Peter van Walsum. In Vitro Determination of the Microbial Inhibition of Hydrolysates Derived from Carbonic Acid Pretreated Biomass. Baylor University Scholars day, Jan 30, 2002.

7. Kemantha Jayawardhana, G. Peter van Walsum. Modeling of Carbonic Acid Pretreatment Process Using ASPEN-Plus. Baylor University Scholars day, Jan 30, 2002.

6. Robert C. McWilliams, G. Peter van Walsum, John Lam. Comparison of Aspen Wood Hydrolysates Produced by Pretreatment with Liquid Hot Water and Carbonic Acid. Baylor University Scholars day, Jan 30, 2002.

5. G. Peter van Walsum, Vanessa Castleberry. Apparent Influence of Pressure on the Distribution of the Degree of Polimerization of Xylose Oligomers Produced Through Acid Hydrolysis of Xylan. Baylor University Scholars day, Jan 30, 2002.

4. Kimberly L. van Walsum, G. Peter van Walsum, Towards a Sustainable Future in Family Therapy. TAMFT Annual Conference. Dallas, Texas. January 24-27, 2001.

3. G. Peter van Walsum. Use of Carbonic acid for Hydrolysis of Xylan. Baylor University Scholar's Day, Waco TX. February 23, 2000.

2. G. Peter van Walsum. Global Warming: Current understanding and Status of International Agreements. Caring for Creation Conference. Baylor University, Waco TX. October 1999.

1. G. Peter van Walsum, Predicting Optimal Displacement of Greenhouse Gas Emissions for Renewable Transportation Fuel Options. Baylor University Scholar's day, Waco TX, February 1999.

SUBMITTED ABSTRACTS

Byung-Hwan Um and G. Peter Van Walsum, Efficiencies of Designed Xylanase Combinations in Releasing Sugars from Hemicellulose Extract on Mixed Northeast Hardwood. Accepted to the 31st Symposium on Biotechnology for Fuels and Chemicals. San Francisco, May 2009.

Aymn Abdulrahman, Byung-Hwan Um, Adriaan van Heiningen, G. Peter van Walsum Acetic Acid Removal from Pre-Pulping Wood Extract. Accepted to the 31st Symposium on Biotechnology for Fuels and Chemicals. San Francisco, May 2009.

Sara Walton, Dwane Hutto, G. Peter van Walsum, Adriaan van Heiningen. Value Prior to Pulping: Extraction of Hemicellulose from Hardwood. Accepted to the 31st Symposium on Biotechnology for Fuels and Chemicals. San Francisco, May 2009.

Sara Walton, G. Peter van Walsum, Adriaan van Heiningen, Fermentation of Near-Neutral pH Extracted Hemicellulose Derived from Northern Hardwood. Accepted to 8th World Congress on Chemical Engineering. Montreal, August 23-27, 2009

PEER-REVIEW AND PROFESSIONAL SERVICE

Conference Session Chair:
AIChE National Meetings, Envisioning Biorefineries Topical Conference. 2006, 2007.
AIChE Spring Meetings, Energy and Transport division 2008, 2009.
26th Symposium on Biotechnology for Fuels and Chemicals, Bioprocessing and Separations, 2004.

Review panels:
Baylor University Research Council
Canada Foundation for Innovation (CFI), Expert committee for energy proposals, 2006, 2009.
AAAS-EPA P3 phase II proposals in biofuels, 2008.
NIH 2008.
SUN Grant, North Central region, 2008.
Fonds québécois de la recherche sur la nature et les technologies, 2008.

A**rticle peer reviews for:**
Applied Biochemistry and Biotechnology
Biochemical Engineering Journal
Bioresource Technology
Bioresources
Biotechnology and Bioengineering
Biotechnology Progress
Carbohydrate Chemistry
Chemical Engineering Communications
Chemical and Industrial Engineering Research
Holzforschung
Journal of Biobased Material and Bioenergy
Worldviews: Environment, Culture, Religion.

ACS area representative to Texas State Legislature, 1999.

FELLOWSHIP, GRANT AND CONTRACT AWARDS—PENDING AND FUNDED

Total funding awarded to date	$2,292,503
G. Peter van Walsum, Ian Bricknell, Nicholas Brown, Jody Jellison. Developing Maine Aquaculture using Forestry and Agricultural By-Products. Congressional earmark request. Submitted February, 2009.	$2,300,000 Under review
David Nievant et. al. Environmentally and Economically Sustainable Biofuels and Bioproducts Derived from Woody Biomass. US DOE/USDA Biofuels and Biobased Product Development preproposal submitted March 2009.	$3,544,786 Under review
Jeff Benjamin, Aaron Weiskittel, Anthony halog, G. Peter van Walsum, Robert Wagner. Evaluation of Alternative Woody Biomass Harvesting Systems in the Northeast US: Long-Term Influence on Feedstock Availability, Environmental Impact, and Energy Use. US DOE/USDA Biofuels and Biobased Product Development preproposal submitted March 2009.	$1,685,000 Under review
G. Peter van Walsum, Clayton Wheeler. Production of higher alcohols liquid biofuel via acidogenic digestion and chemical upgrading of industrial biomass streams. US DOE.10/2008 – 09/2011.	$712,734 3 years
C. Kevin Chambliss, G. Peter van Walsum, Joy Peterson. Assessments of Microbial and Enzyme Inhibition by Analytically Characterized Biomass Pretreatment Hydrolysates USDA NRI. 09/2008 – 08/2011	$493,000 3 years
Stanley W. Eller et. al, Sustainable Bio-based Plastics Cluster Enhancement Proposal. Maine Technology Institute. 06/2008 – 09/2009	$200,000 1.25 year
G. Peter van Walsum, C. Kevin Chambliss (Chemistry).Advancing Texas Biofuel Production: Benefiting Agriculture, Small Business, National Security, and the Environment. White paper submission to the Texas State Energy Conservation Office. 10/2006 – 12/2007.	$250,000 1.25 year
G. Peter van Walsum, Kevin Chambliss (Chemistry), Characterization of Accumulation Trends for Carbohydrate, Lignin and Extractive Degradation Products in Lignocellulose Pretreatment. USDA NRI. 09/2005 – 08/2008.	$374,000 3 years
Kevin Chambliss (Chemistry), G. Peter van Walsum. Identification and Quantitation of Low-molecular-weight Organic Compounds and Carbohydrates in Water Extractives of Corn Stover using HPLC, GC and Tandem Mass Spectrometry. NREL Identification and Quantitation of Water Extractives in Corn Stover. 03/2005 – 02/2006	$105,000 1 year
G. Peter van Walsum, Rene Massengale, Bryan Brooks, Sara Alexander. Uniting Students from Baylor University and Area Schools To Improve Water Quality in Central Texas. 3M Vision Grant. 09/2003 – 08/2005.	$50,000 2 years
G. Peter van Walsum, C. Kevin Chambliss. Quantitative Assessment of Carbohydrate, Lignin and Extractive Degradation Products in Pretreated Lignocellulose. USDA NRI strengthening grant. 09/2003 – 08/2005.	$175,000 2 years

C. Kevin Chambliss. G. Peter van Walsum collaborator. Redox-Recyclable, Reactive Ion Exchange Extraction and Recovery of Fermentation Inhibitors from Biomass Hydrolysis. USDA NRI Young Investigator award, Strengthening Grant. 09/2003 – 08/2005	$105,000 2 years
G. Peter van Walsum. Gas Chromatograph for Application of the MixAlco Process to Digestion of Cattle Manure. USDA NRI equipment grant. 09/2003	$21,500 equipment
Susan P. Bratton, G. Peter van Walsum, Bret Stephenson. Christian Environmentalism With/Out Boundaries, Baylor Environmental Studies Faculty Participation in a Coalition of Christian Colleges and University's Seminar. Baylor Horizons Faculty Grant Program. 07/2003.	$5000 travel
G. Peter van Walsum Acid-Balance Determination of Batch and Flow-Through Pretreated Biomass. Baylor Faculty Research Incentive Program. 12/2002 – 05/2003.	$25,000 6 months
G. Peter van Walsum. Visit to the MixAlco Research Group, Department of Chemical Engineering, Texas A&M University. Big 12 Faculty Fellowship Program. 12/2002.	$2500 travel
G. Peter van Walsum, Rene Massengale. Characterization of Microbial Populations in Non-Sterile Acidogenic Fermentations. University Research Council. 11/2002 – 12/2003	$6000 1 year
G. Peter van Walsum. Group Travel to the 24th Symposium on Biotechnology for Fuels and Chemicals. Environmental Studies Internal Grant 05/2002	$3300 travel
G. Peter van Walsum. Travel funds to attend "Ecology, Theology and Judeo-Christian Environmental Ethics" Baylor Horizons.; 02/2002.	$660 travel
G. Peter van Walsum 2001. Carbonic Acid Pretreatment of Biomass. US Department of Energy. 08/2001 – 02/2003.	$117,245 1.5 years
G. Peter van Walsum. Pretreatment of Biomass for Production of Fuels and Chemicals Using Carbonic Acid. University Research Council, 10/2000 – 10/2001.	$5000 1 year
G. Peter van Walsum. Carbonic Acid Hydrolysis of Xylan. University Research Council. 10/1999 – 10/2000.	$1984 1 year
G. Peter van Walsum 1999 Demonstration of a Solar Powered Vehicle. Baylor University Faculty development grant. 01/1999-05/1999	$1000 equipment
G. Peter van Walsum. Continuous Ethanol Production from Near-Term Cellulosic Substrates. Link Energy Foundation. 08/1994-08/1995	$18,000 1 year
Lee R. Lynd. G. Peter van Walsum (ghost writer). Conversion of Paper Sludges to Ethanol. The Charles A. Lindbergh Foundation. 06/1994-06/1995	$10,580 1 year
Lee R. Lynd. G. Peter van Walsum (ghost writer). Continuous Conversion of Paper Sludge to Ethanol. New Hampshire Governor's Office of Energy and Community Services Appropriate Technology Demonstration Grants Program. 08/1994-08/1995.	$10,000 equipment

PROFESSIONAL EDUCATION

Effective Leadership Skills, AIChE Webinar	2009
Maine Technology Institute (MTI) Cluster Enhancement program overview	2009
SACHE Faculty Workshop on Chemical Process Safety.	2008
7 Habits of Highly Effective People	2006
Association of Energy Engineers: Fundamentals of Energy Auditing	2006
American Institute of Chemical Engineers: Biorefining: Feedstocks, Processes and Products.	2005
Infocast: Federal Biological/Environmental R&D Opportunities FY 2004	2003
Instrumentation and control courses, several (Foxboro, Honeywell, Keystone, etc.)	1988-1990

TEACHING

Courses taught

University of Maine Department of Chemical and Biological Engineering

Chemical Engineering Lab I (co-instructor) CHE 361
Chemical Engineering Lab II (co-instructor) CHE 363
Biochemical Engineering (co-instructor) BLE 460
Special Project Biological Engineering BLE 497
- Use of capsaicin for preservation of packaged food — Spr 2008

Chemical and Biological Engineering Capstone (co-instructor) BLE492
- Optimization of green liquor fermentation using *Pichia stipitis* — Fall 2008

Baylor University Department of Environmental Studies and Glasscock Energy Research Center.

Exploring Environmental Issues ENV 1301 and lab ENV 1101
Environmental Chemistry ENV 3387
Introduction to Environmental Engineering ENV 4349
Environmental Biodegradation and Bioremediation ENV 4383
Integrative Principles in Environmental Studies ENV 5300
Integrated Energy Resource Systems ENV 5368
Advanced Environmental Biotechnology ENV 5383
Advanced Environmental Chemistry ENV 5387
Team Problem Solving in Environmental Studies ENV 4302
- Demonstration of the Practicality of Solar Power: Assembling a Solar vehicle
- Demonstration of the Practicality of Solar Power: Improving the Solar Vehicle
- Effectiveness of artificial wetland remediation of nutrient pollution
- Clean Biomass Fuels for Cooking
- Improving Water Quality in Central Texas through the MixAlco Process
- Assessment of MixAlco Application to Treatment of Dairy manure

Individual research Problems ENV 3V90
- Environmental Chemistry Lab Development

Problems ENV 4V50
- Laboratory Management
- Low-cost wind power

Individual Research Problems ENV 4V90
- Biomass processing (2x)

Topics in Environmental Analysis ENV 5V52
- Biomass Processing (4x)
- Solar drying of citrus waste
- Aspen-Plus Modeling of the Mixalco Process
- Integration of the MixAlco process into the Hydrogen Economy
- Energy Resource Systems
- Recycling Cross-linked Polyethylene
- Current Assessment of MixAlco Conversion
- Economic Assessment of MixAlco Products

Theses Mentored

Erin E. Doyle, 2006. MS. "The Fate of Phosphate in the MixAlco Process and its Applicability to a Central Texas Watershed."

Charlemagne S. Comacho, 2003, MS. "The Development of a Pollution Prevention Assessment Model for Healthcare Facilities."

Kemantha T. Jayawardhana, 2003, MS."Proces Engineering and Economic Analysis of Carbonic Acid Pretreatment of Lignocellulosic Biomass."

Kenneth G. Ransom, 2003, MS. "An Evaluation of Photovoltaic Potential and Load Demand Usage at Baylor University."

Robert C. McWilliams, 2002, MS. "Comparison of Aspen Wood Hydrolysates Produced by Pretreatment with Liquid Hot Water and Carbonic Acid."

Damon M. Yourchisin, 2002, MS. "Comparison of the Microbial Inhibition and Enzymatic Hydrolysis Rates of Liquid and Solid Hydrolysates Produced from Pretreatment of Biomass with Carbonic Acid and Liquid Hot Water."

Current students and Post Docs

Ben Freedman, B.S. Chemical Engineering, B.S. Biological Engineering
Aymn Abdulrahman, M.E. Chemical Engineering
Rakhi Baddam, M.E. Biological Engineering
Sara Walton, Ph.D. Chemical Engineering
Dr. Byung Um, Post Doc.

Guest Lectures

"Biocommodities and Biorefining"
Guest Lecture for Introduction to Chemical and Biological Engineering I. CHB 111. Fall 2008

"Biocommodity Engineering"
Guest Lecture for Introduction to Chemical and Biological Engineering I. CHB 111. Fall 2007

"Engineering Contributions to Energy Supply and Conservation"
Invited lecture to the Baylor School of Engineering and Computer Science. Spring 2005.

"Processing Options for Production of Fuels and Chemicals from Biomass."
University of Minnesota Teaching Colloqium, April 15, 2005

"Engineering Contributions to Energy Supply and Conservation"
Invited lecture to the Baylor School of Engineering and Computer Science. Spring 2004.

"Engineering Contributions to Sustainable Energy Supply and Conservation"
Invited lecture to the Baylor School of Engineering and Computer Science. Fall 2003.

"Alternative Engineering Contributions to Sustainable Energy Supply"
Invited lecture to the Baylor School of Engineering and Computer Science. Spring 2003.

"Engineering Contributions to Sustainable Energy Supply"
Invited lecture to the Baylor School of Engineering and Computer Science. Fall 2002.

"Engineering Contributions to Energy Sustainability"
Invited lecture to the Baylor School of Engineering and Computer Science. Spring 2002.

"Impact of Technology on the Environment"
Invited lecture to the Baylor School of Engineering and Computer Science. Fall 2001.

"Engineering Challenges for Developing Sustainable Industrial Ecology."
Invited lecture to the Baylor School of Engineering and Computer Science. Fall 2000.

"Conventional Energy," "Renewable Energy," "Air Pollution," "Global Atmospheric Change"
Guest Lecture series for Exploring Environmental Issues ENV 1301. Spring 2000.

"Energy Sources," "Air Pollution," Water Pollution."
Guest Lecture series for Environmental Studies Lab ENV 1101. Spring 1999, Fall 1999.

Teaching Development
Baylor University Summer Teaching Institute, Summer 2000.

Textbook Review
Numerous text and chapter reviews in environmental science, energy and the environment, environmental engineering, environmental chemistry.

Teaching Assistantships
Engineering systems. Thayer School of Engineering, Dartmouth College, Hanover NH. 1995.
Chemical Engineering Thermodynamics. McGill University, Montreal, PQ. 1992

SERVICE

University service: University of Maine

Bioconversion Thrust leader, Forest Bioproducts Research Initiative.	2007–present
Chemical and Biological Engineering Bioengineering Curriculum Committee	2007–present
BEAR outreach program (high school research program)	2007–present
Research mentor for REU summer research students	2008-present

University Service: Baylor University

Faculty in Residence, The Arbors residence	2006- 07
Baylor curriculum committee	2004- 07
Baylor facilities committee	2004- 07
HSSSRP Committee	2001- 07
Environmental Studies Curriculum Committee	2001- 07
Environmental Studies Facilities Committee	2001- 07
Chair of facilities committee	2001- 04
Baylor Premiers: 7 times since 2000	2000- 07
Mentor, High School Summer Science Research Project	1999- 06
Chair, Environmental Studies Graduate Program SACS evaluation	2005- 06
Faculty advisor, Baylor Crew Club	1998- 2000, 2006
Baylor Academic success fair	2005
Ecology and Environmental Science PhD proposal committee	2003- 05
Environmental Studies faculty search committee	2001- 05
Chair of search committee	2003- 04
University Research Council	2000- 04
Environmental Studies Chair search committee	2000- 02
Student residences task force.	2000
Faculty advisor, Baylor Solar Racing Club	1999- 2000
Coach to Baylor Novice Crew	1999
Authored progress report on implementation of task force recommendations	1999
Participant in preliminary design of proposed new science building	1998-99
Chair, Baylor Working Group Interdisciplinary Science Center for Alternative Fuels	1998
Student Minister, Assistant to Episcopal Chaplain at Dartmouth College	1994- 96
University Residence Director, McGill University, Montreal, PQ, Canada.	1990- 92

Community service

Choir member, First Church Unitarian Universalist, Belmont MA.	2007- present
Sierra Club, Waco TX	1999- 2007
Central Texas Science Fair Judge.	1999- 2007
St. Paul's Episcopal Church, Waco TX. Member, committee chair, teacher, choir.	1998- 2007
St. Paul's Episcopal School, Waco TX. PTA, science committee, marketing board.	1998- 2006
Piper Child Development Center, Waco TX. Landscape and play ground committees.	2001- 02
Hillcrest School PTA, Waco TX	2001- 02
St.Thomas Episcopal Church, Hanover, NH. Member, lay minister, rector search committee	1993-98
St Stephen's Anglican Church, Mointreal PQ. Member, group leader.	1987-1992

DISTINCTIONS

Baylor University faculty Development grant	1999, 2006
Baylor University Semester Sabbatical	2004
Baylor University Summer Sabbatical	2001, 2003
Big 12 Faculty Fellowship	2002
Baylor University Summer Teaching Institute	2000
Baylor University Summer Scholars Institute	1999
Link Foundation Energy Fellowship	1994
Natural Sciences and Engineering Research Council of Canada Graduate Studies Award	1990, 1992
First prize presentation, Canadian Society of Chemical Engineers student conference	1992
University Scholar, McGill University	1988
Natural Sciences and Engineering Research Council of Canada Under graduate Award	1987
Dean's List, Williams College	1985

OTHER EXPERIENCE

Captain, Sailing Sloop *Seawind IV* 1992-1993
•Captain aboard a 32 foot sailing yacht navigating the east coast of the United States and the Bahamas.
•Overhauled and maintained a marine diesel and other onboard hardware.

Candidate for Canadian national rowing crew 1983

INTERESTS

Triathalon; rowing; music; sailing and outdoor activities. Church member.

CITIZENSHIP

Canadian. Permanent resident of the US.

LANGUAGES

Fluent in French and English.

REFERENCES

Available upon request.