Keith W. Hipel 教授の御略歴

氏名：　Keith William Hipel
(キース ウィリアム ハイペル)
生年月日：　1946 年　3 月 15 日（69 歳）

国籍：　カナダ
性別：　男性
称号：　University Professor, PhD, PEng, FRSC,
FIEEE,FCAE, FAWRA, FINCOSE, FEIC

所属機関名：University of Waterloo(ウォータールー大学)
部局：　Faculty of Engineering(工学部)
Department of Systems Design Engineering (システムデザイン工学科)
所在地:　Waterloo, Ontario,　N2L 3G1, Canada
(ウォータールー市, オンタリオ州, N2L 3G1, カナダ)
E－mail：　kwhipel@uwaterloo.ca
電話：　(519) 888-4567, ext. 32830

現職名：　University Professor(大学著名教授)
President,　Academy of Science, Royal Society of Canada
(カナダ王立協会科学アカデミー　会長)

専門分野：　Systems Design Engineering
(社会システム工学・安全システム)

主な学歴：　大学以降の学位を取得した機関名、学位及び取得年

University of Waterloo,	B.A.Sc.	（Civil Engineering）	1970
University of Waterloo,	M.A.Sc.	（Systems Design）	1972
University of Waterloo,	Ph.D.	（Civil Engineering）	1975

主な職歴　機関名・部局：

1975 年 10 月 1 日～1976 年 3 月 31 日

Visiting Professor，Federal University（Brazil）・Engineering Faculty

1976 年 4 月 1 日～1981 年 6 月 30 日

Assistant Professor，University of Waterloo（Canada）・Faculty of Engineering

1981 年 7 月 1 日～1985 年 6 月 30 日

Associate Professor，University of Waterloo・Faculty of Engineering

1985 年 7 月 1 日～2007 年 6 月 15 日

Full Professor，University of Waterloo・Faculty of Engineering

2007 年 6 月 16 日～現在

University Professor，University of Waterloo・Faculty of Engineering

受賞（主要なものから記載）：

●Norbert Wiener Award （IEEE SMC Society） ノーバート・ウィーナー賞 （IEEE（米国電気電子工学会）SMC 学会）（2000）

●2011 American Water Resources Association (AWRA)： Honorary Membership Award 米国水資源協会名誉会員賞（2011）

●2011 Sir John William Dawson Medal （Royal Society of Canada (RSC)） ジョン・ウィリアム・ドーソン メダル（2011）

●2011 Outstanding Engineering Educator Award (IEEE Canada) 優秀工学教育者賞 (2011)

●Fellow of the Royal Society of Canada（FRSC）カナダ王立協会フェロー (1998)

●University Professor（University of Waterloo）大学著名教授（ウォータールー大学）(2007)

●Docteur Honoris Causa from École Centrale de Lille エコール・サントラル・ドゥ・リール大学名誉博士号（2007）

●Icko Iben Award（The American Water Resources Association）イコ・イベン賞（アメリカ水資源協会）（2004）

●Fellow of the Institute of Electrical and Electronic Engineers（IEEE）米電気電子工学会フェロー（IEEE）（1996）

●Fellow of the Canadian Academy of Engineering (CAE) カナダ工学アカデミーフェロー（1997）

●2011 Best Peer-Reviewed Paper (American Society of Civil Engineers (ASCE)) アメリカ土木学会最優秀論文賞（2011）

Keith W. Hipel 教授 防災研究所への招へいの足跡

１９９９年（平成１１年）度： 外国人客員教授
　　１９９９年5月１０日～１９９９年１２月３１日

２０００年（平成１２年）度： 招へい外国人学者
　　２００１年3月１日～２００１年4月２３日

２００２年（平成１４年）度： 招へい外国人学者
　　２００３年3月２日～２００３年3月３０日

２００４年（平成１６年）度： 招へい外国人学者
　　２００４年１１月１５日～２００４年１２月１４日

２００８年（平成２０年）度： 招へい外国人学者
　　２００９年3月９日～２００９年3月２４日

２０１２年（平成２４年）度： 招へい外国人学者
　　２０１３年3月１日～２０１３年3月３１日

２０１３年（平成２５年）度： 招へい外国人学者
　　２０１４年1月２８日～２０１４年3月３１日

Distinguished Contributions of Keith W. Hipel to Scholarly Research

Overview: Keith Hipel is *University Professor* of Systems Design Engineering at the University of Waterloo, *Past President* of the Academy of Science within the Royal Society of Canada, *Senior Fellow* of the Centre for International Governance Innovation, *Fellow* of the Balsillie School of International Affairs, and *Coordinator* of the Conflict Analysis Group at Waterloo. He is globally renowned for his unique interdisciplinary research from a *Systems Engineering* perspective on the development of *conflict resolution*, *multiple criteria decision analysis (MCDA)*, *time series analysis* and other *decision-making methodologies* for addressing challenging *system of systems engineering* problems lying at the confluence of society, technology and the environment, with applications in *water resources management*, *hydrology*, *environmental engineering*, *energy*, and *sustainable development*.

Conflict Resolution: Keith Hipel and his research team are the originators of the *Graph Model for Conflict Resolution* (GMCR) which constitutes the most comprehensive and flexible formal approach available for systematically investigating real world conflict. The solid mathematical design of GMCR for representing and understanding disputes permits one to model interactive decision making realistically, forecast compromise solutions, and furnish valuable strategic insights. The GMCR methodology includes a novel *theoretical structure* for modelling the key characteristics of conflict; innovative *preference elicitation* methods for capturing stakeholders' value systems; operational techniques for handling *preference uncertainty* (unknown, fuzzy and grey) and *strength of preference*; stability concepts for analyzing different kinds of *human behaviour* under conflict; *policy analysis*; *agent-based modelling* using a GMCR perspective; formal consideration of the influence of psychological factors such as *attitudes*, *emotions* and *misunderstandings* (hypergames); *coalition analysis* for reaching cooperative win/win resolutions; extensive *implementation algorithms* some of which are based on a new matrix approach for equivalently defining GMCR; *hierarchical conflicts*; *third party intervention* using inverse GMCR; and a *decision support system* called GMCR II for permitting practical applications in diverse fields (used by 72 user groups in 25 countries). A 1993 Wiley (New York) book entitled *Interactive Decision Making: The Graph Model for Conflict Resolution* that Hipel wrote with L. Fang and D.M. Kilgour, received excellent reviews. A comprehensive new book on conflict resolution is currently being written.

Multiple Criteria Decision Analysis (MCDA): In MCDA, a set of alternative solutions for solving a given problem is evaluated and compared according to a range of criteria such as costs, benefits, environmental effects, and social impacts. Hipel and his co-workers have designed formal methods for taking *interdependence* among alternatives into account when a final resolution may consist of a combination of alternatives, such as a regional government faced with selecting a mixture of groundwater, lake water and conservation alternatives for

satisfying future water demands. They have developed different kinds of *classification techniques* to handle the elimination of inferior solutions, *sorting* of alternatives into groups ranked according to preference, and placing alternatives into *nominal categories*. As well, they have proposed special MCDA methods for use in *group decision making* and *negotiation*. To handle uncertainty, they have contributed to both *fuzzy and grey MCDA*. Their MCDA methods have been applied to societal decision problems in water supply planning, varying water levels in the Great Lakes, electrical generation, third world infrastructure redevelopment, inventory management and business.

Time Series Modelling: The classic book on *Time Series Modelling of Water Resources and Environmental Systems* (Elsevier, Amsterdam, 1994) that Hipel wrote with A.I. McLeod brings together contributions in stochastic hydrology, statistical water quality modelling and statistics, to create a unified and comprehensive approach to *environmetrics* – the development and application of statistics in the environmental sciences. They also produced an associated decision support system called the *MH Time Series Package*. A great strength of Hipel's research in environmetrics is the integrative employment of exploratory data analysis tools, intervention models (special types of transfer-function noise models), regression analysis and nonparametric trend tests for detecting, modelling, and estimating the magnitudes of trends in environmental time series. This type of *environmental impact assessment* is essential for many important societal activities related to sustainable development including the determination of the effects of land use changes upon the environment, and the effectiveness of pollution abatement policies. Other research in environmetrics to which Hipel made significant contributions includes solving a famous hydrological problem called the *Hurst Phenomenon,* designing algorithms and procedures for use in *model construction*, developing *simulation* algorithms for employment with short and long-memory models, and completing extensive split-sample experiments to ascertain which types of models are most suitable for *forecasting* nonseasonal and seasonal hydrological time series.

Other Decision Making Methodologies: Based on the extensive form of a game, Hipel and his team have constructed *compliance models* for systematically assessing the effectiveness of a range of policies for enforcing and encouraging adherence by firms to environmental laws and regulations. The cost-effectiveness of inducing compliance is assessed in terms of factors such as the private gain for violators, the costs of inspection by agencies and the social value of encouraging sustainable development. Utilizing concepts from economics, ethics, hydrology, and cooperative game theory, a complex optimization approach called the *Cooperative Water Allocation Model* has recently been developed for equitably allocating fresh water among competing users in a river basin with application to both the Aral Sea and South Saskatchewan River Basins. A journal paper on this topic that Hipel wrote with L.Wang and L. Fang won the *2012 Best Publication Award in Environment and Sustainability* from INFORMS (Institute for Operations Research and the Management Sciences). Other contributions of Hipel to *decision*

making under uncertainty include a systems approach to *risk analysis* and *information-gap modelling* in water resources.

System of Systems (SoS) Engineering: Large-scale SoS problems possess great complexity, deep uncertainty, a diversity of agents, conflicting values, interconnections, and emergent behaviour (surprises), as evidenced by the ongoing interdependent problems of climate change, energy shortages, the food crisis, over-population, lack of fresh water, economic instability, widespread pollution and regional wars. Accordingly, Hipel's foregoing research contributions are employed within an SoS framework when addressing complex interconnected problems using *integrative and adaptive governance in a participatory and interdisciplinary fashion*. Hipel and his group are developing a more general theory of SoS engineering and related governance implications to tackle the many pressing SoS problems now facing society and the natural environment.

Impacts: For his valuable contributions to research, mentoring and service, Hipel has received 49 prestigious awards including an important Japanese science prize (*Japan Society for the Promotion of Science Eminent Scientist Award* for which the previous 6 out of 7 recipients are Nobel Prize Laureates); highest international distinction in systems engineering research (*Norbert Wiener Award* from the IEEE Systems, Man and Cybernetics Society); top prizes in water resources research (*Honorary Diplomate, Water Resources Engineers (Hon.D.WRE)* from the American Academy of Water Resources Engineers within the American Society of Civil Engineers; *Honorary Member in the American Water Resources Association* (AWRA)); awards for interdisciplinary research (*Sir John William Dawson Medal* (Royal Society of Canada); *Icko Iben Award* (AWRA)); professional engineering recognition (*Engineering Medal for Research and Development* (Ontario)); and teaching awards (*Outstanding Engineering Educator Award* from IEEE Canada; *Distinguished Teacher Award* (University of Waterloo)). Hipel has influenced academia through the *publication* of highly-cited leading-edge research (4 books, 12 edited books, 289 refereed journal papers and numerous conference articles; high Hirsch Index of 48, over 10,080 citations); *mentoring students* (32 PhD and 47 Master's students have graduated; taught over 5,000 students in Canada and 1,000 more overseas); *curriculum development*; *internationalization of university education* via the establishment of successful student exchange programs with three Japanese universities and a Chinese university; and founding an ongoing sequence of water resources *conferences*. Hipel has further contributed to *technology transfer* via carrying out advanced *consulting* with engineering firms, utilities and government agencies. He was Co-Chair of the *Expert Panel on Energy Use and Climate Change* (Council of Canadian Academies) which produced the report "*Technology and Policy Options for a Low-Emission Energy System in Canada*" (2015).

January 20, 2016

RESEARCH PUBLICATION SUMMARY

(Status as January 20, 2016)

(a) **Books** - 4 refereed books have been published.
(b) **Edited Books** - 12.
(c) **Refereed Journal Papers** – 289.
(d) **Discussions, Comments and Replies in Refereed Journals** - 7.
(e) **Invited Articles in Books, Encyclopedia, and Conference Proceedings** - 173.
(f) **Refereed Conference Papers** - 97.
(g) **Technical Reports** - 57.
(h) **Magazine, Newspaper and Newsletter Articles** - 10.

Research publications under categories (a) to (h) are not directly listed in this document. Instead, representative publications are classified according to research topics.

RESEARCH TOPICS

In this section, relevant refereed journal papers, encyclopedia articles, conference papers and books are categorized according to research topics.

Graph Model for Conflict Resolution

Book

1. Fang, L., Hipel, K.W., and Kilgour, D.M. "Interactive Decision Making: The Graph Model for Conflict Resolution", Wiley, New York, 221 pp., 1993.

Edited Books

1. Hipel, K.W. (Editor), “Conflict Resolution, Volume 1”, Eolss Publishers, Oxford, United Kingdom (ISBN-978-1-84826-120-4 (Adobe e-Book), ISBN-978-1-84826-570-7 Library Edition (Hard Cover)) (Earlier versions of the papers appeared in the Encyclopedia of Life Support Systems.), 2009.
2. Hipel, K.W. (Editor), “Conflict Resolution, Volume 2”, Eolss Publishers, Oxford, United Kingdom (ISBN-978-1-84826-121-1 (Adobe e-Book), ISBN-978-1-84826-571-4 Library Edition (Hard Cover)) (Earlier versions of the papers appeared in the Encyclopedia of Life Support Systems), 2009.

Encyclopedia Articles

1. Hipel, K.W., Kilgour, D.M., and Fang, L., “The Graph Model for Conflict Resolution”, in Wiley Encyclopedia of Operations Research and Management Science, edited by J.J. Cochran (Editor-in-Chief) with L.A. Cox, P. Keskinocak, J.P. Kharoufeh, and J.C. Smith (Area Editors), Wiley, New York, Vol. 3 of 8, pp. 2099-2111, 2011.

2. Hipel, K.W., Kilgour, D.M., and Fang, L., “Conflict Analysis and Resolution”, McGraw-Hill Yearbook of Science and Technology, 2006, McGraw-Hill, New York, pp. 75-77, 2006.
3. Hipel, K.W., "Conflict Resolution", theme overview paper, in Conflict Resolution, Encyclopedia of Life Support Systems (EOLSS), Eolss Publishers, Oxford, United Kingdom, [http://www.eolss.net], 2002.
4. Hipel, K.W., "Formal Models for Conflict Resolution and Case Studies", topic overview paper, in Conflict Resolution, Encyclopedia of Life Support Systems (EOLSS), Eolss Publishers, Oxford, United Kingdom, [http://www.eolss.net], 2002.

Overviews

1. Hipel, K.W. and Bernath Walker, S., “Conflict Analysis in Environmental Management”, Environmetrics, published online in Wiley Online Library on 7 June 2010, DOI: 10.1002/env.1048, Vol. 22, pp. 279-293, 2011.
2. Kilgour, D.M. and Hipel, K.W., “Conflict Analysis Methods: The Graph Model for Conflict Resolution”, In Kilgour, D.M. and Eden, C. (Editors), “Handbook of Group Decision and Negotiation”, Springer, Dordrecht, The Netherlands, pp. 203-222, 2010.
3. Kilgour, D.M., and Hipel, K.W., “The Graph Model for Conflict Resolution: Past, Present, and Future”, Group Decision and Negotiation, Vol. 14, No. 6, pp. 441-460, 2005.
4. Hipel, K.W., Kilgour, D.M., Fang, L., and Li, W., "Resolution of Water Conflicts between Canada and the United States", invited paper published as Section 4.3 in “State-of-the-Art Report on Systems Analysis Methods for Resolution of Conflicts in Water Resources Management”, edited by K.D.W. Nandalal and S.P. Simonovic, a Report prepared for the Division of Water Sciences, United Nations Educational, Science and Cultural Organization (UNESCO), Paris, France, pp. 62-75, 2003.
5. Hipel, K.W., Fang, L., and Kilgour, D.M., "Decision Support Systems in Water Resources and Environmental Management", Keynote Paper, Proceedings of the Third International Conference on Water Resources and Environment Research, edited by G.H. Schmitz, held at the Dresden University of Technology, Dresden, Germany, July 22-25, 2002, vol. I, pp. 287-300, 2002.
6. Hipel, K.W., Fang, L., and Kilgour, D.M., "Game Theoretic Models in Engineering Decision Making", invited paper, Journal of Infrastructure Planning and

Management, Japan Society of Civil Engineering, No. 470/IV-20, pp. 1-16, July 1993.

7. Hipel, K.W., Radford, K.J., and Fang, L., "Multiple Participant Multiple Criteria Decision Making", IEEE Transactions on Systems, Man, and Cybernetics, Vol. SMC-23, No. 4, pp. 1184-1189, 1993.

Theory

1. Fang, L., Hipel, K.W., and Kilgour, D.M., "Conflict Models in Graph Form: Solution Concepts and their Interrelationships", European Journal of Operational Research, Vol. 41, No. 1, pp. 86-100, 1989.
2. Kilgour, D.M., Hipel, K.W., and Fang, L., "The Graph Model for Conflicts", Automatica, Vol. 23, No. 1, pp. 41-55, 1987.

Preference Elicitation

1. Bristow, M., Fang, L., and Hipel, K.W., “From Values to Ordinal Preferences for Strategic Governance”, IEEE Transactions on System, Man, and Cybernetics: Systems, DOI: 10.1109/TSMC.2014.2308154, published online on April, 15, 2014, Vol. 44, No. 10, pp. 1364-1383, 2014.
2. Ke, Y., Fu, B., De, M., and Hipel, K.W., “A Hierarchical Multiple Criteria Model for Eliciting Relative Preferences in Conflict Situations”, Journal of Systems Science and Systems Engineering, DOI: 10.1007/s11518-012-5187-0, Vol. 21, No. 1, pp. 56-76, 2012.
3. Ke, Y., Li, K.W., and Hipel, K.W., “An Integrated Multiple Criteria Preference Ranking Approach to the Canadian West Coast Port Congestion Problem”, Expert Systems with Applications, DOI: 10.1016/j.eswa.2012.02.086, Vol. 39, Issue 10, pp. 9181-9190, August 2012.

Attitudes

1. Bernath Walker, S., Hipel, K.W., and Inohara, T., “Dominating Attitudes in the Graph Model for Conflict Resolution”, Journal of Systems Science and Systems Engineering, DOI: 10.1007/s11518-012-5198-x, Vol. 21, No. 3, pp. 316-336, 2012.
2. Bernath Walker, S.G., Hipel, K.W., and Inohara, T., “Attitudes and Preferences: Approaches to Representing Decision Maker Desires”, Applied Mathematics and Computation, DOI: j.amc.2011.11.102, published online since January 11, 2012, Vol. 218, Issue 12, pp. 6637–6647, February 2012.
3. Bernath Walker, S., Hipel, K.W., and Inohara, T., "Strategic Decision Making for Improved Environmental Security: Coalitions and Attitudes in the Graph Model for

Conflict Resolution", Journal of Systems Science and Systems Engineering, special issue on Strategic Decision Making for Global Security from a Systems Engineering Perspective in the Post-911 Environment, Vol. 18, No. 4, pp. 461-476, 2009.

4. Inohara, T., Hipel, K.W., and Walker, S., "Conflict Analysis Approaches for Investigating Attitudes and Misperceptions in the War of 1812", Journal of Systems Science and Systems Engineering, Vol. 16, No. 2, pp. 181-201, 2007.

Fuzzy Preferences

1. Bashar, M.A., Obeidi, A., Kilgour, D.M., and Hipel, K.W., "Modeling Fuzzy and Interval Fuzzy Preferences within a Graph Model Framework", IEEE Transactions on Fuzzy Systems, accepted for publication subject to making a minor change on April 13, 2015.
2. Bashar, M.A., Hipel, K.W., Kilgour, D.M., and Obeidi, A., "Coalition Fuzzy Stability Analysis in the Graph Model for Conflict Resolution", Journal of Intelligent and Fuzzy Systems, DOI: 10.3233/IFS-141336, accepted for publication on June 11, 2014.
3. Bashar, M.A., Kilgour, D.M., and Hipel, K.W., "Fuzzy Option Prioritization for the Graph Model for Conflict Resolution", Fuzzy Sets and Systems, DOI: 10.1016/j.fss.2014.02.11, appeared online on February 26, 2014, Vol. 246, pp. 34-48, 2014.
4. Bashar, Md.A., Kilgour, D.M., and Hipel, K.W., "Fuzzy Preferences in the Graph Model for Conflict Resolution", IEEE Transactions on Fuzzy Systems", DOI: 10.1109/TFUZZ.2012.2183603, Vol. 20, No. 4, pp. 760-770, August 2012.
5. Hipel, K.W., Kilgour, D.M., and Bashar, M.A., "Fuzzy Preferences in Multiple Participant Decision Making", Scientia Iranica, Transactions D: Computer Science & Engineering and Electrical Engineering, special publication dedicated to the lifelong achievements of Professor Lotfi A. Zadeh, Vol. 18, No. 3(D1), pp. 627-638, June 2011.
6. Al-Mutairi, M.S., Hipel, K.W., and Kamel, M.S., "Fuzzy Preferences in Conflicts", Journal of Systems Science and Systems Engineering, Vol. 17, No. 3, pp. 257-276, 2008.
7. Al-Mutairi, M.S., Hipel, K.W., and Kamel, M.S., "Trust and Cooperation from a Fuzzy Perspective". Mathematics and Computers in Simulation, online since April 6, 2007, doi:10.1016/j.matcom.2007.04.006, Vol. 76, pp. 430-446, 2008.

Grey Preferences

1. Kuang, H., Bashar, M.A., Kilgour, D.M., and Hipel, K.W., “Strategic Analysis of a Brownfield Revitalization Conflict Using the Grey-based Graph Model for Conflict Resolution”, EURO Journal on Decision Processes, DOI: 10.1007/s40070-015-0042-4, accepted for publication on April 8, 2015.
2. Kuang, H., Bashar, M.A., Hipel, K.W., and Kilgour, D.M., “Grey-based Preference in a Graph Model for Conflict Resolution with Multiple Decision Makers”, IEEE Transactions on Systems, Man and Cybernetics: Systems”, DOI: 10.1109/TSMC.2014.2387096, to appear, 2015.

Unknown Preferences

1. Li, K.W., Hipel, K.W., Kilgour, D.M., and Noakes, D.J., “Integrating Uncertain Preferences into Status Quo Analysis with Application to an Environmental Conflict,” Group Decision and Negotiation, Vol. 14, No. 6, pp. 461-479, 2005.
2. Li, K.W., Hipel, K.W., Kilgour, D.M., and Fang, L., "Preference Uncertainty in the Graph Model for Conflict Resolution", IEEE Transactions on Systems, Man, and Cybernetics, Part A, Vol. 34, No. 4, pp. 507-520, 2004.

Preference Robustness

1. Ben-Haim, Y., and Hipel, K.W., "The Graph Model for Conflict Resolution with Information-Gap Uncertainty in Preferences", Applied Mathematics and Computation, Vol. 126, pp. 319-340, 2002.

Strength of Preference

1. Xu, H., Hipel, K.W., Kilgour, D.M., and Chen, Y., “Combining Strength and Uncertainty for Preferences in the Graph Model for Conflict Resolution with Multiple Decision Makers”, Theory and Decision, DOI 10.1007/s11238-009-9134-6, Vol. 69, No. 4, pp. 497-521, 2009.
2. Xu, H., Hipel, K.W., and Kilgour, D.M., “Multiple Levels of Preference in Interactive Strategic Decisions”, Discrete Applied Mathematics, Vol. 57, pp. 3300-3313, 2009.
3. Hamouda, L., Kilgour, D.M., and Hipel, K.W., “Strength of Preference in Graph Models for Multiple Decision-Maker Conflicts”, Applied Mathematics and Computation, Vol. 179, pp. 314-327, 2006.
4. Hamouda, L., Kilgour, D.M., and Hipel, K.W., "Strength of Preference in the Graph Model for Conflict Resolution", Group Decision and Negotiation, Vol. 13, pp. 449-462, 2004.

Emotions

1. Obeidi, A., Kilgour, D.M., and Hipel, K.W., “Perceptual Stability Analysis of a Graph Model System”, IEEE Transactions on Systems, Man, and Cybernetics, Part A, Humans and Systems”, Vol. 39, No. 5, pp. 993-1006, 2009.
2. Obeidi, A., Kilgour, D.M., and Hipel, K.W., “Perceptual Graph Model Systems”, Group Decision and Negotiation, special issue on Emotion and Interactive Technology, Vol. 18, No. 3, pp. 261-277, 2009.
3. Obeidi, A., Hipel, K.W., and Kilgour, D.M., “The Role of Emotions in Envisioning Outcomes in Conflict Analysis”, Group Decision and Negotiation, Vol. 14, No. 6, pp. 481-500, 2005.

Coalitions

1. Inohara, T. and Hipel, K.W., “Coalition Analysis in the Graph Model for Conflict Resolution”, Systems Engineering, Vol. 11, No. 4, pp. 343-359, 2008.
2. Inohara, T. and Hipel, K.W., “Interrelationships among Noncooperative and Coalition Stability Concepts”, Journal of Systems Science and Systems Engineering, Vol. 17, No. 1, pp. 1-29, 2008.
3. Kilgour, D.M., Hipel, K.W., Peng, X., and Fang, L., "Coalition Analysis in Group Decision Support", Group Decision and Negotiation, Vol. 10, pp. 159-175, 2001.

Evolution of a Conflict

1. Xu, H., Kilgour, D.M., Hipel, K.W., and Kemkes, G., “Using Matrices to Link Conflict Evolution and Resolution within the Graph Model”, European Journal of Operational Research, Vol. 207, pp. 318-329, 2010.
2. Xu, H., Li, K.W., Hipel, K.W., and Kilgour, D.M., “A Matrix Approach to Status Quo Analysis in the Graph Model for Conflict Resolution”, Applied Mathematics and Computation, Vol. 212, No. 2, pp. 470-480, 2009.
3. Li, K.W., Kilgour, D.M., and Hipel, K.W., “Status Quo Analysis in the Graph Model for Conflict Resolution”, Journal of the Operational Research Society, Vol. 56, pp. 699-707, 2005.
4. Li, K.W., Kilgour, D.M., and Hipel, K.W., “Status Quo Analysis of the Flathead River Conflict”, Water Resources Research, Vol. 40, No. 5, W05S03, doi:10.1029/2003WR002596 (9 pages), 2004.

Hierarchical Conflicts

1. He, S, Kilgour, D.M., Hipel, K.W., and Bashar, M.A., “A Basic Hierarchical Graph Model for Conflict Resolution with Application to Water Diversion Conflicts in

China", INFOR: Information Systems and Operational Research, Vol. 51, No. 3, pp. 103-119, 2013.

2. He, S., Hipel, K.W., and Kilgour, D.M., "Water Diversion Conflicts in China: A Hierarchical Perspective", Water Resources Management, Vol. 28, No. 7, pp. 1823-1837, 2014.

Inverse Graph Model for Conflict Resolution

1. Kinsara, R.A., Petersons, O., Hipel, K.W., and Kilgour, D.M., "Advanced Decision Support System for the Graph Model for Conflict Resolution", Journal of Decision Systems, Special Issue on Integrated Decision Support Systems, accepted for publication on March 12, 2015.
2. Kinsara, R.A., Kilgour, D.M., and Hipel, K.W., "Inverse Approach to the Graph Model for Conflict Resolution", IEEE Transactions on Systems, Man, and Cybernetics: Systems, DOI: 10.1109/TSMC.2014.2376473, Vol. 45, No. 5, pp. 734-742, 2015.

Policy Analysis

1. Zeng, D-Z., Fang, L., Hipel, K.W., and Kilgour, D.M., "Policy Equilibrium and Generalized Metarationalities for Multiple Decision-Maker Conflicts", IEEE Transactions on Systems, Man, and Cybernetics, Part A, Vol. 37, No. 4, pp. 456-463, 2007.
2. Zeng, D-Z., Fang, L., Hipel, K.W., and Kilgour, D.M., "Generalized Metarationalities in the Graph Model for Conflict Resolution", Discrete Applied Mathematics, Vol. 154, No. 16, pp. 2430-2443, 2006.
3. Zeng, D.Z., Fang, L., Hipel, K.W., and Kilgour, D.M.,"Policy Stable States in the Graph Model for Conflict Resolution", Theory and Decision, Vol. 57, pp. 345-356, 2005.

Matrix Representation of the Graph Model.

1. Xu, H., Kilgour, D.M., Hipel, K.W., and McBean, E.A., "Theory and Implementation of Coalition Analysis in Cooperative Decision Making", Theory and Decision, DOI: 10.1007/s11238-013-9363-6, Vol. 76, No. 2, pp. 147-171, 2014.
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