



Department of Geography – Orillia Campus.

GEOG/ENST 4451

'Geography of Risk and Hazard'

Winter 2018: January - April

Globally, the vulnerability of our communities to the impacts of natural hazards is on the rise, while as a society at large, we have generated the greatest innovation and wealth in our history. We are technologically and scientifically 'better off' today, but unfortunately these resources are not transforming into community capacity and resilience to address uncertainty. The global costs of natural hazards and disasters will continue to increase under a 'dominant view' of risk management that devotes expert attention to politically 'relevant' risks but ignores human vulnerability.

Students will explore an interdisciplinary perspective of environmental risk and hazards that is centered on the geography of disasters. Information on the physical processes and impacts of natural and technological hazards will be essential to our understanding of disaster, however the underlying theory of the course looks at *how society lives with risk and responds to disasters and environmental change*. Risk and hazards are often viewed as accidents that are separated from normal life, however *vulnerability* is largely a product of our socio-economic, political and resource relationships that create the conditions for disaster to occur. Physical and social sciences explore natural and technical disasters to provide diverse definitions of risk and hazards; explore diverse risk perceptions and assessments; individual and societal acceptance of the

management of risk; human vulnerability; and the social and cultural context of risk.

Course readings provide theoretical implications of natural hazards impacts and human vulnerability (social and environmental justice and security) while the seminars will be a composition of interactive workshops, presentations, and class discussions covering a range of local, regional and international disaster and risk-based case studies. Course participation is a critical element of this fourth year seminar, and complete attendance is expected (within reasonable limitations), as well as the required readings. The course grade will be a product of a student research project carried out over the entire term, as well as article presentations and participation during each seminar. The research project is broken down into task components designed to develop your topic, writing and research skills as we proceed through the course material.

Calendar: An examination of the geographic theories, constructs, frameworks and methods used in the study of risk and hazard. Emphasis is placed upon human-environment interaction in environmental and technological hazards.

Prerequisites: Geography 1150 or 1170 or permission of the Chair of the Department of Geography and the Environment (Dr. Rob Stewart).

Notes: Open only to students in third and fourth year of any program except with permission of the Chair of the Department of Geography and the Environment.

Course classifications:

Type B: Social Sciences

Type C: Engineering, Mathematical and Natural Sciences

Credit weight: 0.5.

Tuesdays and Thursdays 1:00pm – 2:30pm in OA2006

Instructor: Lisa TUTTY BSc (hon) MSc **Contact information:**

Email: ltutty@lakeheadu.ca (*that is an “L” for Lisa*); please email using your lakeheadu email and put the course code in the subject line. You can generally expect a response within 48 hours.

Office hours: are in my cubicle on the third floor of Simcoe Hall, this is a *shared* cubicle and I am only there on Wed noon-1pm. Sometimes I will be in OA1002 during my office hours (computer lab), please email if you'd like my precise location.

Course website: through D2L (you will find lecture notes and readings there, as well as much important information).

Course goals:

By the end of this course, you will be able to:

- a) *Conduct scientific research* to create an academic project
- b) *Communicate scientific research* to your peers
- c) *Properly paraphrase and cite* (in APA format) *scientific literature*
- d) *Critically analyze scientific literature and apply ideas and concepts to new risk/hazard situations*

Marks breakdown:

Participation (useful, respectful) in seminar each class - **10%**

Weekly Article analysis and presentation – **40%** (groups assigned to specific journal readings, see groups at bottom of this page)

Term project: Individual.

Research topic statement **5% Fri Feb 2** before end of day on D2L

Research proposal and outline **15% Fri Mar 2** before end of day on D2L

Research project (website OR magazine OR poster): **30% Th Mar 31** in class

Group A: Kinsie, Laura, Patrick

Group B: Andrew, April, Bradie, Katherine

Group C: David, Ian, Megan, Meghan

If these groups need to be changed please switch with someone and let me know.

Course schedule found on pages 8-10.

A+	90 to 100%	Outstanding understanding of the course concepts including integration of materials and ideas, ability to apply knowledge to situations
A	80 to 89%	
B	70 to 79%	Above average to excellent knowledge, ability to apply knowledge to situations
C	60 to 69%	Satisfactory knowledge including ability to recognise and apply major course concepts, and to progress to next level of course
D	50 to 59%	Some grasp of course concepts; will likely encounter difficulty with higher levels
E	40 to 49%	Failed to meet minimum requirements of the course
F	1 to 39%	Failure
F	0	Failure resulting from academic dishonesty

Mark descriptions from Lakehead University. Students are advised to refer to the University Calendar to ensure that they have adequate grades and/or average to proceed in their program. Grades in this course are numerical (not letters).

Textbook: Smith, K. (2013). Environmental Hazards: Assessing risk and reducing disaster. Routledge.

Course policies on lateness and absence:

Late submissions may be accepted however the late penalty is 10% per day, including weekends.

Absences and lateness: You may receive consideration for your late work (meaning no late penalty) if you submit the **Certificate of Illness or Incapacitation** (for all health related concerns) or an appropriate piece of documentation for other excuses (ex. certification from the funeral home for the death of a close relative). The proper documentation must be received as soon as possible after the missed deadline. For absences for reasons of illness use the **Certificate of Illness or Incapacitation**, for compassionate reasons or representing the university off-campus you will require written documentation in order to be receive *potential consideration* for an assignment extension. The late penalty for assignments (without consideration as described above) is 10% per day late, including weekends. Late assignments should be submitted to Lisa via the D2L website. You may email copies of your documentation to Lisa but must submit proper paper copies when you return to class.

https://www.lakeheadu.ca/sites/default/files/forms/Certificate%20of%20Illness_Incapacity.pdf

Student services:

Lakehead University has **counselling services, a nurse practitioner, and a naturopathic doctor** available, at the Wellness Centre-Orillia Campus the Centre makes appointments in person or by phone. Please contact the Centre at 705-330-4008 ext. 2115. The Wellness Centre is located in OA 1015.

<https://www.lakeheadu.ca/current-students/student-services/or/health-and-wellness>

The University provides academic accommodations for students with disabilities in accordance with the terms of the Ontario Human Rights Code. This occurs through a collaborative process that acknowledges a collective obligation to develop an accessible learning environment that both meets the needs of students and preserves the essential academic requirements of the University's courses and programs.

Lakehead University has a **Student Accessibility Services (SAS)** office which provides support services and advocacy on behalf of students with disabilities. The SAS office is located in OA 1030 (Orillia Academic Building).

Phone: +1 (705) 330-4008 ext. 2103 Email: rudffhvvC@nhkhdx1fd#

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Student Success Centre: They have advisors, tutoring and peer-assisted learning and are located on the first floor of Simcoe Hall in OA 1031. This includes help with writing and editing and math. If you have questions please call 1 (705) 330-4008 ext. 2118 <https://www.lakeheadu.ca/current-students/student-success-centre/academic-support-zone/orillia>

Lakehead University Library services: Use it to search for journal articles for your term project for example <http://library.lakeheadu.ca/>

Technology Services Centre Helpdesk: TSC Helpdesk is the liaison between Lakehead University's IT services and users (Students, Faculty & Staff and by extension to guests and visitors). The principal purpose of the Helpdesk is to provide quick resolution to inquiries. <https://www.lakeheadu.ca/faculty-and-staff/departments/services/tsc>

Academic integrity – Code of student behaviour and disciplinary procedures.
<https://www.lakeheadu.ca/faculty-and-staff/policies/student-related/code-of-student-behaviour-and-disciplinary-procedures>

Academic Integrity:

Academic integrity is fundamental to learning and scholarship at Lakehead University. Participating honestly, respectfully, responsibly, and fairly in this academic community ensures that the degree that you earn will be valued as a true indication of your individual academic achievement, and will continue to receive the respect and recognition it deserves. The University takes a most serious view of offences against academic honesty such as plagiarism, cheating and impersonation. Penalties for dealing with such offences will be strictly enforced.

The "Code of Student Behaviour and Disciplinary Procedures" including sections on plagiarism and other forms of misconduct may be found on the Lakehead University Senate website. See the Code under “Policies - Student Related” in the University Policies at policies.lakeheadu.ca.

Potential offences include, but are not limited to:

In papers and assignments:

- Using someone else’s ideas or words without appropriate acknowledgement.
- Copying material word-for-word from a source (including lecture and study group notes) and not placing the words within quotation marks.

- Submitting your own work in more than one course without the permission of the instructor.
- Making up sources or facts.
- Including references to sources that you did not use.
- Obtaining or providing unauthorized assistance on any assignment including:
 - Working in groups on assignments that are supposed to be individual work;
 - Having someone rewrite or add material to your work while “editing”.
 - Lending your work to a classmate who submits it as his/her own without your permission.

Misrepresentation:

- Falsifying or altering any documentation required by the University, including doctor’s notes.
- Falsifying institutional documents or grades.

The following rules shall govern the treatment of candidates who have been found guilty of attempting to obtain academic credit dishonestly.

(a) The minimum penalty for a candidate found guilty of plagiarism, or of cheating on any part of a course will be a zero for the work concerned.

(b) A candidate found guilty of cheating on a formal examination or a test, or of serious or repeated plagiarism, or of unofficially obtaining a copy of an examination paper before the examination is scheduled to be written, will receive zero for the course and may be expelled from the University.

Neat 15 minute exercise from Cardiff University (Avoiding plagiarism):

https://xerte.cardiff.ac.uk/play_4216

	Topic	Textbook readings: Smith, K. (2013). Environmental hazards: Assessing risk and reducing disaster.	Readings: Journal articles NOTE GROUP A, B, C tags on some articles. That group is responsible for article summary and critique. Everyone reads all articles tagged 'everyone'.	Due dates:
Week 1: Jan 9 and 11	The Nature of Hazard I (Risk perception and communication)	1. Hazard in the Environment 2. Dimensions of Disaster	<p>GROUP A Calka, B., Da Costa, J.N., and Bielecka, E. (2017). Fine scale population density data and its application in risk assessment. Geomatics, Natural Hazards, and Risk, 8(2), 1440-1455.</p> <p>EVERYONE Khan, S., Mishra, J.L., Lin, K.E., and Doyle, E.E.H. (2016). Rethinking communication in risk interpretation and action. Natural Hazards, 88(3), 1709–1726.</p> <p>GROUP B Lo, A.Y., and Chan, F. (2017). Preparing for flooding in England and Wales: the role of risk perception and the social context in driving individual action. Natural Hazards, 88, 367–387.</p> <p>GROUP C Wei, B., Nie, G., Su, G., Sun, L., Bai, X., and Qi, W. (2017). Risk assessment of people trapped in earthquake based on km grid: a case study of the 2014 Ludian earthquake, China. Geomatics, Natural Hazards, and Risk, 8(2), 1289-1305.</p>	Group A/B/C and Everyone summary & critiques uploaded on D2L before Thursday class and brought to class with you on Thursday
Week 2: Jan 16 and 18	The Nature of Hazard II (Risk management and adaptation, Community risk and resilience)	3. Complexity, Sustainability and Vulnerability 4. Risk Assessment and Management 5. Reducing the Impacts of Disaster	<p>GROUP A Husby, T.G., and Koks, E.E. (2017). Household migration in disaster impact analysis: incorporating behavioural responses to risk. Natural Hazards, 87, 287–305.</p> <p>GROUP B Iwasaki, K., Sawada, Y., and Aldrich, D.P. (2017). Social capital as a shield against anxiety among displaced residents from Fukushima. Natural Hazards, 89(1), 405–421.</p> <p>EVERYONE Martín, Y., Rodrigues Mimbreno, M., Zúñiga-Antón, M. (2017). Community vulnerability to hazards: introducing local expert</p>	Group A/B/C and Everyone summary & critiques uploaded on D2L before Thursday class and brought to class with you on Thursday

			<p>knowledge into the equation. Natural Hazards, 89(1), 367–386.</p> <p>GROUP C Qin, W., Lin, A., Fang, J., Wang, L., and Li, M. (2017). Spatial and temporal evolution of community resilience to natural hazards in the coastal areas of China. Natural Hazards, 89(1), 331–349.</p>	
Week 3: Jan 23 and 25	The Experience and Reduction of Hazard – Tectonic Hazards I (<i>Geographic Regions of Risk</i>)	6. Tectonic Hazards - Earthquakes and Tsunamis	<p>GROUP A Jahanandish, A., and Nirupama, N. (2017). Quantitative analysis of earthquake fatalities: case of Iran. Natural Hazards, 87, 567–579.</p> <p>GROUP B Golabi, M., Shavarani, S.M., and Izbirak, G. (2017). An edge-based stochastic facility location problem in UAV-supported humanitarian relief logistics: a case study of Tehran earthquake. Natural Hazards, 87, 1545–1565.</p> <p>GROUP C Sadeghi, M., Ghafory-Ashtiany, M., and Pakdel-Lahiji, N. (2017). Multi-objective optimization approach to define risk layer for seismic mitigation. Geomatics, Natural Hazards, and Risk, 8(2), 257-270.</p> <p>EVERYONE Wronna, M., Baptista, M.A. and Götz, J. (2017). On the construction and use of a Paleo-DEM to reproduce tsunami inundation in a historical urban environment – the case of the 1755 Lisbon tsunami in Cascais. Geomatics, Natural Hazards, and Risk, 8(2), 841-862.</p>	Group A/B/C and Everyone summary & critiques uploaded on D2L before Thursday class and brought to class with you on Thursday
Week 4: Jan 30 and Feb 1	Tectonic Hazards II	7. Tectonic Hazards - Volcanoes	<p>EVERYONE Toulkeridis, T. and Zach, I. (2017). Wind directions of volcanic ash-charged clouds in Ecuador – implications for the public and flight safety. Geomatics, Natural Hazards, and Risk, 8(2), 242-256.</p>	Research topic statement due Fri Feb 2 - 5% ‘Everyone’ summary & critique uploaded on D2L before Thursday class and brought to class with you on Thursday

Week 5: Feb 6 and 8	Mass movement	8. Landslide and Avalanche Hazards	<p>EVERYONE Bianchini, S., Raspini, F., Ciampalini, A., Lagomarsino, D., Bianchi, M., Bellotti, F., and Casagli, N. (2017). Mapping landslide phenomena in landlocked developing countries by means of satellite remote sensing data: the case of Dilijan (Armenia) area. 225–241.</p> <p>EVERYONE Kanwal, S., Atif, S., and Shafiq, M. (2017). GIS based landslide susceptibility mapping of northern areas of Pakistan, a case study of Shigar and Shyok Basins. Geomatics, Natural Hazards, and Risk, 8(2), 348-356.</p>	'Everyone' summary & critique uploaded on D2L before Thursday class and brought to class with you on Thursday
Week 6: Feb 13 and 15	Severe storms	9. Severe Storm Hazards	<p>GROUP A Hoekstra, S., and Montz, B. (2017). Decisions under duress: factors influencing emergency management decision making during Superstorm Sandy. Natural Hazards, 88, 453–471.</p> <p>GROUP B Huang, S., Wu, H., Lindell, M.K., Wei, H., and Samuelson, C.D. (2017). Perceptions, behavioral expectations, and implementation timing for response actions in a hurricane emergency. Natural Hazards, 88, 533–558.</p> <p>GROUP C Hung, L. (2017). Married couples' decision-making about household natural hazard preparedness: a case study of hurricane hazards in Sarasota County, Florida. Natural Hazards, 87, 1057–1081.</p>	Group A/B/C summary & critique uploaded on D2L before Thursday class and brought to class with you on Thursday
Week 7: READING WEEK				
Week 8: Feb 27 and Mar 1	Weather, disease, and wildfire	10. Weather Extremes, Disease Epidemics and Wildfires	<p>GROUP A Grasso, N., Lingua, A.M., Musci, M.A., Noardo, F., and Piras, M. (2018). An INSPIRE-compliant open-source GIS for fire-fighting management. Natural Hazards, 90(2), 623–637.</p> <p>GROUP B Valdez, M.C., Chang, K., Chen, C., Chiang, S., and Santos, J.L. (2017). Modelling the spatial variability of wildfire susceptibility in Honduras using remote sensing and</p>	<p>Research proposal and outline due Fri Mar 2 - 15%</p> <p>Group A/B/C summary & critiques uploaded on D2L before Thursday class and brought to</p>

			<p>geographical information systems. Geomatics, Natural Hazards, and Risk, 8(2), 876-892.</p> <p>GROUP C Zhao, J., Xu, J., Li, X., Zhong, Y., Han, D., and Qui, H. (2017). Characteristics analysis of spatial and temporal variation on extreme weather events in Anhui Province for recent 50 years. Natural Hazards, 89(2), 817–842.</p>	class with you on Thursday
Week 9: Mar 6 and 8	Hydrologic I	11. Hydrological Hazards - Floods	<p>GROUP A Bhatt, C.M., Rao, G.S., Farooq, M., Manjusree, P., Shukla, A., Sharma, S.V.S.P., Kulkarni, S.S., Begum, A., Bhanumurthy, V., Diwakar, P.G. and Dadhwal, V.K. (2017). Satellite-based assessment of the catastrophic Jhelum floods of September 2014, Jammu & Kashmir, India. Geomatics, Natural Hazards, and Risk, 8(2), 309-327.</p> <p>GROUP B Bhatt, C.M., Rao, G.S., Diwakar, P.G., and Dadhwal, V.K. (2017). Development of flood inundation extent libraries over a range of potential flood levels: a practical framework for quick flood response. Geomatics, Natural Hazards, and Risk, 8(2), 384-401.</p> <p>GROUP C Soetanto, R., Mullins, A., and Achour, N. (2017). The perceptions of social responsibility for community resilience to flooding: the impact of past experience, age, gender and ethnicity. Natural Hazards, 86, 1105-1126.</p>	Group A/B/C and summary & critique uploaded on D2L before Thursday class and brought to class with you on Thursday
Week 10: Mar 13 and 15	Hydrologic II	12. Hydrological Hazards - Droughts	<p>GROUP A Chen, C.F., Son, N.T., Chen, C.R., Chiang, S.H., Change, L.Y., and Valdez, M. (2017). Drought monitoring in cultivated areas of Central America using multi-temporal MODIS data. Geomatics, Natural Hazards, and Risk, 8(2), 402-417.</p> <p>GROUP B Li, Y., Wang, Y., and Chen, X. (2017). The roles of community assets in mitigating the impact of drought on grain yields in Northwest</p>	Group A/B/C summary & critiques uploaded on D2L before Thursday class and brought to class with you on Thursday

			<p>China. Natural Hazards, 89(2), 801–815.</p> <p>GROUP C Ullah, R., Shivakoti, G.P., Zulfiqar, F., Iqbal, M.N., and Shah, A.A. (2017). Disaster risk management in agriculture: tragedies of the smallholders. Natural Hazards, 87, 1361–1375.</p>	
Week 11: Mar 20 and 22	Technological (and social) hazards	13. Technological Hazards	<p>GROUP A Bhaganagar, K., and Bhimireddy, S.R. (2017). Assessment of the plume dispersion due to chemical attack on April 4, 2017, in Syria. Natural Hazards, 88(3), 1893–1901.</p> <p>GROUP B Bickerstaff, K., and Simmons, P. (2009). Absencing/presencing risk: Rethinking proximity and the experience of living with major technological hazards. Geoforum, 40(5), 864-872.</p> <p>GROUP C Mayhorn, C.B., and McLaughlin, A.C., (2014). Warning the world of extreme events: A global perspective on risk communication for natural and technological disaster. Safety Science, 61, 43-50.</p>	Group A/B/C summary & critique uploaded on D2L before Thursday class and brought to class with you on Thursday
Week 12: Mar 27 and 29	Changing Earth (Disaster and development)	14. Environmental Hazards in a Changing World	<p>GROUP A Rawat, P.K., Pant, C.C., and Bisht, S. (2017). Geospatial analysis of climate change and emerging flood disaster risk in fast urbanizing Himalayan foothill landscape. Geomatics, Natural Hazards, and Risk, 8(2), 418-447.</p> <p>GROUP B Sun, Y., Wang, S., Li, J., Zhao, D., and Fan, J. (2017). Understanding consumers' intention to use plastic bags: using an extended theory of planned behaviour model. Natural Hazards, 89(3), 1327–1342.</p> <p>EVERYONE Wei, J., Zhan, W., Guo, X., Marinova, D.(2017). Public attention to the great smog event: a case study of the 2013 smog event in</p>	<p>Research project (website OR magazine OR poster) due Thurs Mar 31 in class - 40%</p> <p>Group A/B/C and Everyone summary & critiques uploaded on D2L before Thursday class and brought to class with you on Thursday</p>

			<p>Harbin, China. Natural Hazards, 89(2), 923–938.</p> <p>GROUP C Wu, X., Qi, W., Hu, X., Zhang, S., and Zhao, D. (2017). Consumers’ purchase intentions toward products against city smog: exploring the influence of risk information processing. Natural Hazards, 88, 611–632.</p>	
<p>Week 13: Apr 3 and 5</p>	<p>Urban Hazards (Mapping and Emergency Management, People with disabilities)</p>		<p>EVERYONE Carmen-Paz Castro, C., Sarmiento, J., Edwards, R., Hoberman, G., and Wyndham, K. (2017). Disaster risk perception in urban contexts and for people with disabilities: case study on the city of Iquique (Chile). Natural Hazards, 86, 411-436.</p> <p>EVERYONE Qie, Z., and Rong, L. (2017). An integrated relative risk assessment model for urban disaster loss in view of disaster system theory. Natural Hazards, 88, 165–190.</p>	<p>‘Everyone’ summary & critique uploaded on D2L before Thursday class and brought to class with you on Thursday</p>

***Schedule subject to change.**

Group A: Kinsie, Laura, Patrick

Group B: Andrew, April, Bradie, Katherine

Group C: David, Ian, Megan, Meghan

If these groups need to be changed please switch with someone and let me know.