

# **ENV-MA75: Narratives of Environmental Change**

## **Module Syllabus**

Semester 1, 2012/2013: Teaching slot EJL

Convenor: Professor Mike Hulme

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## **Pre-requisites**

Students will be admitted to this Module if: (a) they have been accepted for the MA/MSc in Environmental Sciences and Humanities; or (b) they have an undergraduate (Bachelors) degree in any field of natural or environmental sciences or studies, geography, social sciences or humanities subject and are registered for a MSc in the School of Environmental Sciences.

## **Synopsis**

The ways in which we think about and study environmental change – its natural and human causes and the human responsibilities and responses it invokes - are heavily shaped by the concepts, metaphors and models we develop and deploy. Collectively, these elements contribute to the making of narratives, stories which have coherence, structure, resonance and credibility. This is as true for scientists as it is for artists as it is for lay citizens. And yet these constructed narratives of environmental change are not timeless. They emerge at particular times and places and have their own history; they change over time and they vary across cultures.

Nor do they go uncontested. Different narratives of environmental change can be hugely influential in shaping public discourses about the environment and, in particular, in shaping the types of policy interventions that different actors and institutions may propose. The stories told about past environmental changes, and the human implication in them, have significant bearing on future types and goals of policy interventions. The aim of this Module is to introduce students to a range of different narratives of environmental change which have been influential in Western thought and action over the last 200 years and especially over the last 50 years. It also aims to show how different narratives of past and present changes can be used to shape different environmental policy futures.

The Module draws upon the sub-disciplines of environmental history, cultural geography, futures studies and systems theory and is taught by three experts in these fields. The Module is divided into two parts. In Part 1 (Weeks 1 to 7), each week will introduce a different narrative of environmental change which has acquired salience and rhetorical power over recent decades. Each narrative will be introduced through seminal papers/books which have given powerful expression and influence to the narrative and then by examining how the narrative has been taken-up in scientific study, policy development and popular discourse. The Faculty-led seminar each week will offer the opportunity for students to read more widely around the respective narrative and to discuss and debate in class its assumptions and implications. The narratives will be selected from the following long-list (\*\* those selected for 2012/13):

- Anthropocene – e.g. Dukes (2011)
- \*\*Apocalypse – e.g. Killingsworth & Palmer (1986)

- Climate change – e.g. Fleming (1998/2005)
- Collapse – e.g. Diamond (2005)
- Earth System Science – e.g. Schellnhuber & Wenzel (1998)
- \*\*Industrialisation – e.g. Wrigley (2010)
- \*\*Limits – e.g. Malthus (1798); Meadows et al. (1972)
- Pathways – e.g. Leach et al. (2010)
- \*\*Planetary boundaries – e.g. Rockström et al. (2010)
- \*\*Resilience – e.g. Holling (1986)
- Revolutions – e.g. Lenton & Watson (2011)
- \*\*Tipping points – e.g. Lenton et al. (2008); Skrimshire (2010)
- \*\*Transitions – e.g. Grin et al. (2010)
- Worldviews – e.g. Tarnas (1991/2010)

In Part 2 of the Module (Weeks 8 to 12), students will work in pairs (or triplets) to present and lead an assessed hour-long seminar on an agreed topic which brings together one or more historical narratives with areas of live policy debate or social change. These topics will be selected (negotiated) from a list provided by the Module Convenor. Students will be required to research and then critically examine how different narratives of environmental change are being deployed in these policy/social domains and with what effect (in terms of knowledge, ethics, power, participation, etc.).

### **Learning outcomes**

On completion of this Module students should be able to:

- recognise the historically and culturally situated character of different narratives of environmental change;
- identify how such narratives are being deployed/manipulated in contemporary environmental discourses and policy debates;
- assess critically how these deployments are embraced and/or resisted by different social actors and interests;
- illustrate and communicate all of the above in a group setting by making and defending a presentation on a specific topic.

### **Teaching and Independent Learning**

Reading: Students are expected to commit a minimum of 5 hours of per week in reading associated material, additional to the reading required for their coursework assignments.

Lectures: 50 minutes to introduce each narrative in turn, emphasising its current usage, but more importantly its origins and historical evolution and context. How does the narrative/metaphor relate to questions of knowledge, power, ethics, worldviews, etc?

Weekly reading lists to be prepared of between 5 and 20 items, segregated into core/essential reading and interesting/optional.

Faculty-led Seminars: Attendance is compulsory, unless prior absence is authorised by the Module Convenor. These seminars are linked to the preceding Monday lecture and will require students to read at least one or two items in advance and be prepared to discuss them in class. Guiding questions will be posed in advance. Film/DVDs etc. may be used as part of discussion.

## Teaching Schedule

Monday lectures are from 12.00-12.50pm. Thursday mornings may extend up to 3 hours.

Week	Date	Time and Venue	Session	Staff member	Notes
<b>Week 1</b>	Mon 24 Sep	12.00 pm E Fry 01.10	L-1 : Limits	PW	A brief Module introduction will precede Paul's lecture
	Thu 27 Sep	9.00 am C Hall 0.17	Sem-1 : Limits	PW	
<b>Week 2</b>	Mon 1 Oct	12.00 pm SCI 3.05	L-2 : Industrialisation	PW	
	Thu 4 Oct	9.00 am C Hall 0.17	Sem-2 : Industrialisation	PW	
<b>Week 3</b>	Mon 8 Oct	12.00 pm E Fry 1.34	L-3 : Resilience	AH	
	Thu 11 Oct	9.00 am E Fry 1.34	Sem-3 : Resilience	AH	
<b>Week 4</b>	Mon 15 Oct	12.00 pm E Fry 1.34	L-4 : Transitions	AH	
	Thu 18 Oct	9.00 am E Fry 1.34	Sem-4 : Transitions	AH	
<b>Week 5</b>	Mon 22 Oct	12.00 am SCI 3.05	L-5 : Apocalypse	MH	
	Thu 25 Oct	9.00am E Fry 1.34	Sem-5: Apocalypse	MH	
<b>Week 6</b>	Mon 29 Oct	12.00 pm SCI 3.05	L-6 : Tipping Points	MH	
	Thu 1 Nov	9.00 am E Fry 1.34	Sem-6 : Tipping Points	MH	
<b>Week 7</b>	Mon 5 Nov	12.00 pm E Fry 1.34	L-7 : Planetary Boundaries	MH	
	Thu 8 Nov	9.00 am E Fry 1.34	Sem-7 : Planetary Boundaries	MH	
<b>Week 8</b>	Thu 15 Nov	9.00 am E Fry 1.34	Briefing for seminar projects	All	Pairs of students to be decided
<b>Week 9</b>	Wed 21 Nov	<b>Submit coursework essay (on-line) to PGT Hub</b>			By 3pm
<b>Weeks 9-</b>	<b>Group research for seminars</b>				

<b>11</b>					
<b>Week 12</b>	Wed 12 Dec	2.00 pm To be decided	Seminar presentations	All	Student attendance compulsory
	Thu 13 Dec	9.00 am C Hall 0.17	Seminar presentations	All	

## Assessment

The Module will be assessed through two pieces of coursework: an extended independent review essay and a seminar presentation.

Coursework Essays (60% of marks): You will select one essay title from the list below and write a 4,000 word essay, due on Wednesday of Week 9 (21<sup>st</sup> November 2012). You are expected to read widely around the topic and offer a critical review of the published literature in order to address the topic/question. The essay should be clearly structured, using section headings if you wish, and you should illustrate your answers with appropriate examples. Your own judgement and interpretation of the literature should be clear from your writing style. The essay should be fully referenced (published books and journals; unpublished and web-based sources) following either the Harvard style of referencing or else a footnoting system. Your essay will be marked by two members of Faculty according to these criteria:

		<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	
Context	Wide knowledge, well placed in context						Superficial, incomplete appreciation of the context
Structure	Clear, logical structure						Confused, rambling structure
Critical reasoning	Independent, incisive, original						Weak, illogical, derivative
Conclusions	Very good interpretation and insight						Weak interpretation and insight
Use of sources	Wide range, discerning, properly referenced						Few sources, not relevant, wrongly referenced
Presentation	Attractive, accurate, readable						Unattractive, inaccurate, hard to read
<b>Overall assessment</b>							

Essay titles:

*“Are narratives of environmental change essentially morality tales?”*

*“Examine the ways in which the narratives of resilience and tipping points are antagonistic and/or synergistic?”*

*“Should sustainability transitions be conceived of as a new (phase of) industrial revolution? Discuss.”*

*“Identify, and evaluate the significance of, the similarities and differences between the post-war ‘limits’ narrative with that of ‘planetary boundaries in the 2010s”*

*“How effective are environmental narratives of apocalypse and tipping points in mobilising behavioural and social change?”*

*“To what degree has the use of particular technologies been seen as determining destiny in narratives of environmental change?”*

*“Can a sustainable society live within ecological limits and maintain resilience. Discuss.”*

Assessed Student Seminar Presentations: Attendance by all students is compulsory. Students will work in pairs (or triplets if numbers require) to research and prepare a presentation on a topic which requires them to critically examine how a designated contemporary policy discourse and/or social movement draws upon different environmental narratives (i.e., those introduced in Part 1 of the Module). For each topic, a separate guidance and resource list will be made available containing reading material, web-sites, potential expert interviewees within the School (and maybe elsewhere), films/DVDs, etc. A designated member of staff will be available for each topic for consultation during the preparation period (Weeks 8 to 11).

Each presentation must be structured around four elements, applied to the respective case study: (i) defining the scope and context of the issue; (ii) describing the environmental narratives deployed; (iii) critique: identifying problems and tensions; (iv) insights and policy recommendations. Each presentation – which should be no more than 30 minutes - must be shared equally by the students, who must then respond to questions and comments from the class. Each presenter will be assessed through peer-evaluation (20% of Module marks, half of which will be a group mark and half an individual mark) and through staff evaluation (20% of Module marks, similarly split between group and individual performance). The marking criteria will be as follows:

Peer or Faculty evaluation	Criteria	Presenter 1	Presenter 2	(Presenter 3)
Group mark (10%)	<ul style="list-style-type: none"><li>• Structure</li></ul>			

<b>of Module)</b>	<ul style="list-style-type: none"> <li>• Content (scope, critique, recommendations)</li> <li>• Slide design and clarity</li> </ul>			
<b>Individual mark (10% of Module)</b>	<ul style="list-style-type: none"> <li>• Responses to questions and comments</li> <li>• Communicative ability</li> </ul>			
<b>Overall mark (average of the marks above)</b>				

The available seminar case study topics might include:

- *Civil society organisations and narratives*
- *The narratives of global climate engineering*
- *Climate change adaptation*
- *Nature conservation*
- *Energy security*

### General Background Reading for the Module

Brown,V.A., Harris,J.A. and Russell,J.Y. (eds.) (2010) *Tackling wicked problems through the transdisciplinary imagination* Earthscan, London, 312pp.

Christian, D. (2004) *Maps of time. An introduction to big history* University of California Press, Berkeley, 642 pp

Coates, P. (1998) *Nature. Western attitudes since ancient times* University of California Press, Berkeley, 246 pp.

Costanza,R., Graumlich,L.J. and Steffen,W. (eds.) (2007) *Sustainability or collapse? An integrated history and future of people on Earth* MIT Press, Boston MA, 520pp.

Diamond,J. (2005) *Collapse: how societies choose to fail or succeed* Penguin, London, UK, 575pp

Dukes,P. (2011) *Minutes to midnight: history and the Anthropocene Era from 1763* Anthem Press, London, 166pp.

Fleming,J.R. (1998/2005) *Historical perspectives on climate change* Oxford University Press, New York, USA, 194pp.

Garrard,G. (2004) *Ecocriticism: the new critical idiom* Routledge, London, 203pp.

Grin,J., Rotmans,J., Schot,J. and Geels,F. (2010) *Transitions to sustainable development: new directions in the study of long term transformative change - Routledge studies in sustainability transitions 1* Routledge, London

Hastrup,K. and Skrydstrup,M. (eds.) (2012, in press) *Anticipating nature: climate modeling at different scales* Routledge

- Heise,U.K. (2008) *Sense of place and sense of planet* Oxford University Press, Oxford, 250pp.
- Holling,C.S. (1986) The resilience of terrestrial ecosystems: local surprise and global change pp. 217-232 in, *Sustainable development of the biosphere* (eds.) Clark,W.C. and Mann,R.E., Cambridge University Press, Cambridge, UK, 500pp.
- Hulme,M. (2009) *Why we disagree about climate change: understanding controversy, inaction and opportunity* Cambridge University Press, Cambridge, 393pp.
- Kagan,J. (2009) *The three cultures: natural sciences, social sciences and the humanities in the 21<sup>st</sup> century* Cambridge University Press, Cambridge, 310pp.
- Larson,B. (2011) *Metaphors for environmental sustainability: redefining our relationship with nature* Yale University Press, New Haven CT, 317pp.
- Latour,B. (1993) *We have never been modern* (translation by C Porter) Harvester/Wheatsheaf, New York, 157pp.
- Leach,M., Scoones,I. and Stirling,A. (2010) *Dynamic sustainabilities: technology, environment, social justice* Taylor & Francis, 232pp.
- Lenton,T. and Watson,A.J. (2011) *Revolutions that made the Earth* Oxford University Press, Oxford, 448pp.
- Malthus,T.R. (1798/2008) *An essay on the principle of population* Oxford University Books, Oxford, 200pp.
- Meadows,D.H., Meadows,D.L., Randers,J. and Behrens,W.W. (1974) *Limits to growth* Universe Books, 205pp.
- Penna, A.N. (2010) *The human footprint. A global environmental history* Wiley-Blackwell, Chichester, 354pp.
- Radkau, J. (2008) *Nature and power. A global history of the environment* Cambridge University Press, Cambridge, 430pp.
- Robin,L., Sörlin,S. and Warde,P. (eds.) (2013, in press) *The future of nature. Documents of global change* Yale University Press, New Haven CT [pdf available through Blackboard]
- Schellnuber,H-J. and Wenzel,V. (eds.) (1998) *Earth system analysis: integrating science for sustainability* Springer-Verlag, Berlin, 530pp.
- Skrimshire,S. (ed.) (2010) *Future ethics: climate change and apocalyptic imagination* Continuum Press, London, 290pp.
- Sörlin,S. and Warde,P. (eds.) (2009) *Nature's end. History and the environment* Palgrave, Basingstoke, 368pp.
- Stager,C. (2011) *Deep future: the next 100,000 years of life on Earth* Thomas Dunne Books, New York, 300pp.
- Tarnas,R. (1991/2010) *The passion of the Western mind: understanding the ideas that have shaped our world view* Harmony Books
- Wrigley,E.A. (2010) *Energy and the English Industrial Revolution* Cambridge University Press, Cambridge, 272pp.

## Week 1: Limits

Lecture: One of the most profound and troubling arguments confronting modern society over the past two centuries is the idea that we live on a finite planet, and that this imposes impassable limits to human progress. These arguments have taken a variety of forms, ranging from abstract and logical exercises to inferences from local observations of resource depletion or environmental degradation. At the same time, such narratives have often been imbued with a deep unease about apparently limitless human ambitions, whether as consumers of goods and resources, in their proclivity to procreate, or in their capacity to transform nature and their own society. This lecture will examine the ways in which arguments about limits have shifted their focus and methods over time, from the population theories of Thomas Malthus to the 'world systems' computer modelling developed from in the 1970s onwards, and the way in which such arguments were taken up in political and social debates.

Seminar: In preparation for the seminar you will be required to read the essential reading marked below with a view to discussing the following questions:

- What kind of evidence have theorists of limits brought forward to justify their argument?
- How and why have the targets of arguments about 'limits' shifted over time?
- How have narratives about limits framed the problem in relation to the urgency of political action?
- How have narratives of limits been opposed?

### Seminar Reading (\*\* essential):

\*\* Robin, L., Sörlin, S. and Warde, P. (eds.) (2013, in press) *The future of nature. Documents of global change* Yale University Press [pdf available through Blackboard]

Sections on Malthus, Ordway and *the Limits to Growth*. It is also advisable (though not essential reading) to read the rest of the section on Population.

Borgström, G. (1969) *Too many: A study of the Earth's biological limitations*, New York: The MacMillan Company.

Connelly, M. (2008) *Fatal misconception: the struggle to control world population*. London: Belknap Press.

Linnér, B.-O. (2003) *The return of Malthus: Environmentalism and postwar population-resource crises*. Cambridge, UK: White Horse Press.

Meadows, D.H., Randers, J., Meadows, D.L. (2004) *The limits to growth. The thirty year update*. London: Routledge.

Simon, J.L., Kahn, H. (eds) (1984) *The resourceful Earth*. Oxford: Blackwell.

Smil, V. (2005) Limits to growth: a review essay *Population and Development Review* 31(1): 157–64.

## Week 2: Industrialisation

Lecture: It has become a commonplace argument that modern industrialization has created the most fundamental rupture for thousands of years, if not the whole of human history, both in the organisation of human societies themselves, and the relationship between humans and the environment. This has been framed in a variety of ways: as the result of technological change and new economic dependencies, especially related to the transformation of energy; as a change in people's mindset and a new desire for innovation and the advancement of knowledge; and as shifts in the ways in which humans exploit nature and each other. In turn, the industrial Revolution and its aftermath can be dramatised as a story of progress, liberty, and the growth of knowledge, where humans have become capable of consciously steering their society towards unparalleled sustained growth; or alternatively, as a story of environmental and social degradation, arrogance, and eventual hubris. This lecture will outline the basic patterns and magnitude of changes associated with industrialization, and especially how these have related to arguments about sustainability.

Seminar: In preparation for the seminar you will be required to read the essential reading marked below with a view to discussing the following questions.

- What was revolutionary about the Industrial Revolution?
- Has industrialization brought about a fundamentally new era in human-environment relations?
- Why do arguments about what is 'sustainable' differ so radically?
- How has the role of technology been framed in narratives of industrialization and its consequences?

### Seminar Reading (\*\* essential):

\*\* Robin, L., Sörlin, S. and Warde, P. (eds.) (2013, in press) *The future of nature. Documents of global change* Yale University Press [pdf available through Blackboard]

Sections on Huzar and Marchetti. Also is it as advisable (although not essential) to read the entire sections on Sustainability and Technology

Costanza, R., Graumlich, L.J. and Steffen, W. (eds.) (2007) *Sustainability or collapse? An integrated history and future of people on Earth* MIT Press, Boston MA, 520pp.

\*\* Cronon, W. (1992) A place for stories: nature, history and narrative *The Journal of American History* 78(4), 1347-1376

Kander, A., Malanima, P. and Warde, P. (2013) *Power to the people. Energy and economy in Europe, 1600-2000*, Princeton University Press, Princeton. [available as PDF on Blackboard]

Madureira, N.L. (2012) The anxiety of abundance: William Stanley Jevons and coal scarcity in the nineteenth century *Environment and History* 18 (3): 395-421.

Mumford, L. (1934) *Technics and civilization* Harcourt, Brace & World, New York.

Sieferle, R.P. (2001) *The subterranean forest*, White Horse Press, Knapwell

Smil, V. (2008) *Energy in nature and Society*, MIT Press, Cambridge MA.

Wrigley, E.A. (2010) *Energy and the English Industrial Revolution* Cambridge University Press, Cambridge, 272pp.

### **Week 3: Resilience**

Lecture: The term resilience has a wide range of different uses in different disciplines and areas of political and economic life. The usage of most relevance to discussions of sustainability is the body of research on resilience in socio-ecological systems (Folke 2006; Gallopín 2006) that conceptualizes interacting human and ecological systems and seeks to inform practical intervention through adaptive management.

This lecture will present some of the key ideas from resilience thinking and explore their relevance to attempts to confront the present ecological crisis.

In a recent review article Carl Folke (a leader in the field) describes the origins of what he terms the resilience perspective (Folke 2006). Folke describes how the term originated in one particular branch of ecology in the 1960–1970s, where a better understanding of system dynamics inspired both social and environmental scientists to challenge the then dominant stable equilibrium view of social and ecological systems, leading to the more dynamic formulation of the concept of resilience (Holling 1973, 1986, 2001). He goes on to state that the resulting resilience approach “emphasizes non-linear dynamics, thresholds, uncertainty and surprise, how periods of gradual change interplay with periods of rapid change and how such dynamics interact across temporal and spatial scales”.

Although it has grown out of empirical work on ecosystem dynamics, interpreted through mathematical models, there has in recent years been an accelerating research effort to integrate the social dimension with many areas of the social sciences involved in related studies of socio-ecological systems. Early work on resilience focused on resilience as “the capacity to absorb shocks and still maintain function” (Folke 2006) but there is another aspect of resilience that “concerns the capacity for renewal, re-organization and development, which has been less in focus but is essential for the sustainability discourse....in a resilient social-ecological system, disturbance has the potential to create opportunity for doing new things, for innovation and for development” (Folke 2006). The converse idea being that such a capacity will be lacking in a system with a low resilience.

Folke (2006) then interprets social–ecological resilience as: 1) the amount of disturbance a system can absorb and still remain within the same state or domain of attraction, 2) the degree to which the system is capable of self-organization (versus lack of organization, or organization forced by external factors), and 3) the degree to which the system can build and increase the capacity for learning and adaptation. Taken in this wider sense resilience

provides a broad approach, or way thinking about linked social and ecological systems. Resilience as the concept has evolved for social-ecological systems then is not just about the ability to maintain a status quo, but is also about the ability of the system to adapt, innovate and transform under certain conditions, “into new more desirable configurations” (Folke 2006). Overall the potential of the resilience perspective is seen as being to “shift policies from those that aspire to control change in systems assumed to be stable, to managing the capacity of social–ecological systems to cope with, adapt to, and shape change” (Folke 2006). Resilience theory as it has developed then is a powerful conceptual framework for understanding (and steering) change in socio-ecological systems.

Seminar: In this seminar we will discuss the key ideas behind the so called “resilience thinking” and discuss how useful the notion of resilience might be to current societal challenges. In preparation for the seminar you will be asked to read the articles listed below with a view to discussing the following questions:

- What are the essential elements/components in the concept of resilience?
- Can you identify what key (explicit and implicit) assumptions underlie the concept of resilience?
- How does it differ from the concept of sustainability?
- How does resilience deal with normative aspects of visioning different possible futures?
- How can resilience thinking be applied to real-world problems? At the scale of a town or city, a country and the whole of planet earth?
- What challenges do you think might arise in implementing the concept? And what might be the advantages (compared to other approaches)?

Seminar Reading (\*\* essential):

\*\* Folke,C. (2006) Resilience: The emergence of a perspective for social-ecological systems analyses *Global Environmental Change* 16, 253-267

\*\* Gallopin,G. (2006) Linkages between vulnerability, resilience, and adaptive capacity *Global Environmental Change* 16(3), 293-303

\*\* Hopkins,R. (2009) TED Talk by the founder of the Transition Towns movement.  
[http://www.ted.com/talks/rob\\_hopkins\\_transition\\_to\\_a\\_world\\_without\\_oil.html](http://www.ted.com/talks/rob_hopkins_transition_to_a_world_without_oil.html)

\*\* Walker,B. (2009) A short explanation of resilience. Provided by the Stockholm Resilience Centre, available on you-tube at <http://www.youtube.com/watch?v=tXLMeL5nVQk>

[Various other short talks on resilience are available on you-tube as part of e.g. the Stockholm Whiteboard seminars].

Additional suggested readings for the seminar (readings/viewings to be shared amongst the group) ...

There is huge amount of material available on the web about how resilience thinking is being applied in many diverse fields. A good place to start is the website of the Stockholm

Resilience Centre (<http://www.stockholmresilience.org/>) which provides videos of past seminars and other materials. In particular there is this presentation by Buzz Holling, the founder of resilience theory, who talks about how resilience thinking emerged; a good way to get a bit of a historical perspective:

<http://www.stockholmresilience.org/seminarandevents/seminarandeventvideos/buzzhollingfatheroftheresiliencetheory.5.aeea46911a3127427980003713.html>

## **Week 4: Transitions**

Lecture: The term transition has a wide range of differing uses in different academic disciplines and areas of political and economic life. In this lecture we will focus on the notion of transitions in the context of debates about how modern industrial societies can achieve a sustainable development.

In recent years a literature on so called sustainability transitions has emerged. Drawing explicitly on insights from studies of historical transitions (especially major technological transitions during the industrial era), it offers both a conceptual framework and nascent management tools for understanding and governing transitions. Here the term transition is used to signify a fundamental, or system-wide, change in a social and economic system rather than an incremental change within a system (e.g. the transition from sailing ships to steam ships as a dominant mode of maritime transport).

Understanding transitions is especially important when dominant 'solutions' (and the socio-technical systems that deliver these) contribute to unsustainable development and when novel solutions might offer more sustainable alternatives, or when we face persistent problems that cannot be solved using only the currently dominant solutions. In the context of debates about sustainability, we are interested in understanding the processes and patterns of competition among established and novel solutions to questions of production and consumption. We are interested in how novel and radical solutions emerge (as socio-technical 'niches') and become sufficiently powerful to challenge and, ultimately, overthrow a dominant solution (the prevailing 'regime' of production and consumption including the associated practices and set of actors) resulting in a transition.

The transitions literature develops the notion of socio-technical niches as protected spaces where new social and technical practices can develop. It juxtaposes the niche against a dominant socio-technical regime and has surveyed many empirical examples in an attempt to understand the dynamics of how niches can grow and eventually oust a dominant regime.

Both the transitions and resilience literatures deal with approaches to managing change in human systems; the two approaches have different emphasises, deriving in part from their different origins. The sustainability transitions approach focuses on systems-level innovation as a means of addressing problems, while the resilience approach has traditionally focused on the ability of a system to maintain its structure and function in the face of disturbance;

however resilience researchers are now also very concerned with “transformations” in social-ecological systems.

This lecture will present some of the key ideas from the transitions research literature and explore their relevance to thinking about how to confront the present crisis of our industrial era.

Seminar: In this seminar we will identify some of the key concepts that underpin recent research on transitions to sustainability and debate the importance of systems innovation and systemic change in imagining how a shift to a more sustainable society can be achieved. In preparation for the seminar you will be asked to read the articles listed below with a view to discussing the following questions:

- In what sense is the term transition used? And how is it applied to the notion of sustainability in this body of research?
- What is the Multi-level perspective? And how is it being applied to the analysis of transitions?
- In what ways are the concept of systems innovation and systemic change helpful in thinking about how to achieve a more sustainable society?
- What different types of systemic change can you envision for our present society?
- What might be the role of civil society in sustainability transitions?

Seminar Reading (\*\* essential):

Geels,F.W. (2011) The multi-level perspective on sustainability transitions: Responses to seven criticisms *Environmental Innovation and Societal Transitions* 1(1), 24-40

Meadowcroft,J. (2011) Engaging with the politics of sustainability transitions *Environmental Innovation and Societal Transitions* 1(1), 70-75

Smith, A., Voß, J.P. and J. Grin (2010) Innovation studies and sustainability transitions: the allure of the multi-level perspective, and its challenges *Research Policy* 39, 435-448

van den Bergh,J.C.J.M., Truffer,B. and Kallis,G. (2011) Environmental innovation and societal transitions: Introduction and overview *Environmental Innovation and Societal Transitions* 1(1), 1-23

Additional suggested readings for the seminar (readings to be shared amongst the group)

Grin,J., Rotmans,J. and Schot,J. (2011) On patterns and agency in transition dynamics: Some key insights from the KSI programme *Environmental Innovation and Societal Transitions* 1(1), 76-81

Smith,A. (2012) Civil society in sustainable energy transitions. In: *Governing the Energy Transition: Reality, Illusion or Necessity?* Routledge Studies in Sustainability Transitions . Routledge, New York, pp. 180-202. ISBN 9780415888424

Stirling,A. (2011) Pluralising progress: From integrative transitions to transformative diversity *Environmental Innovation and Societal Transitions* 1(1), 82-88

## Week 5: Apocalypse

Lecture: The environmentalism of the last 50 years has never been far away from the language of apocalypse, an idea which has deep religious origins especially in Judaeo-Christian history and its cultural legacies in Western Europe and North America. Rather than implying merely a catastrophic finality or ending, the idea of apocalypse also carries interesting associations of un-veiling secret knowledge and of redemption. Invoking environmental apocalypse is not merely about prediction, but also about a call for salvation. This lecture will examine the ways apocalypse has entered the vocabulary and philosophy of environmentalism and some of the implications of this for cultural, social and political change.

Seminar: In preparation for the seminar you will be required to read either Buell's and/or Garrard's and/or Skrimshire's chapters on apocalypse with a view to discussing the following questions:

- What is the relationship between environmental science and an apocalyptic narrative?
- How does the apocalyptic narrative draw strength from its religious origins?
- Does the idea of environmental apocalypse point us to the future (and the accuracy of predictions) or to the present (and the call to change)?
- How effective is the fear of environmental apocalypse in changing individual behaviours and/or collective cultures?

### Seminar Reading (\*\* essential):

\*\* Buell, F. (2010) A short history of environmental apocalypse Chapter 1 (pp.13-36) in: *Future ethics: climate change and apocalyptic imagination* (ed.) Skrimshire, S., Continuum Press, London, 290pp.

Dunlap, T.R. (2004) *Faith in nature: environmentalism as religious quest* University Washington Press, Seattle WA, 206pp.

\*\* Garrard, G. (2004) Chapter 5: Apocalypse (pp.85-107) in: *Ecocriticism: the new critical idiom* Routledge, London 203pp.

Killingsworth, M.J. and Palmer, J.S. (1996) Millennial ecology: the apocalyptic narrative from *Silent Spring* to global warming pp.21-45 in, *Green culture: environmental rhetoric in contemporary America* (Eds.) Herndl, C.G. and Brown, S.C., University of Wisconsin Press, Madison IN, 315pp.

\*\* Skrimshire, S. (2010) Eternal return of apocalypse Chapter 10 (pp.219-241) in: *Future ethics: climate change and apocalyptic imagination* (ed.) Skrimshire, S., Continuum Press, London, 290pp.

## Week 6: Tipping Points

Lecture: The language of ‘tipping points’ was introduced into climate and Earth system science in the mid-2000s, picking up earlier usage of the metaphor in the social and epidemiological sciences and popularised by Malcolm Gladwell’s best-selling book. Its usage in both scientific and popular discourse around climate change has grown rapidly in recent years, with a climate arts programme called ‘The Tipping Point’ and various science programmes seeking to refine the concept and discern where tipping points may lie in the Earth system. This lecture will trace the origins and history of this usage, exploring the metaphorical and conceptual ways it has been deployed in science, media, politics and the arts.

Seminar: In the seminar we will watch, and then discuss, a 30-minute DVD call “Beyond the tipping point” produced by Stefan Skrimshire. In the seminar we will reflect on how the idea of climate ‘tipping points’ affects how people think about and engage with the future. In addition to the starred item above, you must read these two on-line articles, one by Stefan Skrimshire, the creator of the DVD we will be looking at - [www.redpepper.org.uk/Curb-your-catastrophism/](http://www.redpepper.org.uk/Curb-your-catastrophism/) - and the other by Andrew Sims of the new economics foundation in which he outlines his thinking behind the *onehundredmonths* project - [www.guardian.co.uk/environment/2008/aug/01/climatechange.carbonemissions](http://www.guardian.co.uk/environment/2008/aug/01/climatechange.carbonemissions).

### Questions for consideration:

- Is climate tipping point a metaphor or a description of a physical reality? Why has the idea of climate tipping points only emerged since 2005?
- Does the discourse of climate tipping points create a sense of crisis or of opportunity? Does this have a chilling effect on climate politics? What happens to political action after the last chance has passed?
- What is action on climate change for – to change the future; to prepare for the future; or is action on climate change an expression of personal identity – how people define themselves and their values?
- Can you think of other examples of the idea of tipping points being deployed in public policy advocacy?

### Seminar Reading (\*\* essential):

de Goede, M. and Randalls, S. (2009) Precaution, pre-emption: arts and technologies of the actionable future *Environment and Planning D: Society and Space* 27(5), 859-878

Lenton, T.M., Held, H., Krieglar, E., Hall, J.W., Lucht, W., Rahmstorf, S. and Schellnhuber, H.-J. (2008) Tipping elements in the Earth’s climate system *Proceedings of the National Academy of Sciences* 105(6), 1786-1793

\*\* Nuttall, M. (2012) Tipping points and the human world: living with change and thinking about the future *Ambio* 41, 96-105

\*\* Russill,C. and Nyssa,Z. (2009) The tipping point trend in climate change communication  
*Global Environmental Change* 19(3), 336-344

## **Week 7: Planetary Boundaries**

Lecture: The narrative of planetary boundaries (and it's offering a 'safe operating space for humanity') was introduced in 2009 by a group of scholars led by the Stockholm Environment Institute. It has gained considerable attention (e.g. Rio+20) – and some criticism – in the last three years. The original account of environmental change suggested nine planetary boundaries, three of which have already been transgressed (climate change, biodiversity loss, the nitrogen cycle), although others have been proposed. This lecture will summarise the idea of planetary boundaries and how they emerged from Earth system science, and how they relate to the earlier narrative of limits.

Seminar: In preparation for this seminar you must read Rockström's original article and also Blomqvist's recent critique. We will watch Rockström's TED presentation and also Kate Raworth's recent intervention – summarized on YouTube <http://www.youtube.com/watch?v=PCAx3TG8Lkl> - in which she argues for a fuller appreciation of human agency and social justice. We will discuss three of the main criticisms of planetary boundaries: whether they are global rather than regional; their lack of consideration of human innovation and technology; and their masking of questions of social and political justice.

### Questions for consideration:

- What is the difference between a boundary, a threshold and a limit?
- How immutable are these boundaries? Is there any room for human innovation/adaptation in shifting where these boundaries may lie?
- Is there validity in the criticism that (some of) these boundaries are regional and not global and therefore that questions of distribution and social justice have been marginalised?
- This narrative works with the idea of a 'safe operating space for humanity'. But focusing on environmental boundaries doesn't do justice to the cultural and political dimensions of human living.

### Seminar Reading (\*\* essential reading):

\*\* Blomqvist,L., Nordhaus,T. and Shellenberger,M. (2012) *The planetary boundaries hypothesis: a review of the evidence* The Breakthrough Institute, Oakland CA, 42pp.

Cornell,S. (2012) On the system properties of the planetary boundaries *Ecology and Society* 17(1), r2

Galaz,V., Biermann,F., Folke,C., Nilsson,M. and Olsson,P. (2012) Global environmental governance and planetary boundaries: an introduction *Ecological Economics* 81, 1-3

Lewis,S.L. (2012) We must set planetary boundaries wisely *Nature* 485, 417

Raworth,K. (2012) *A safe and just space for humanity: can we live within the doughnut?* Oxfam Discussion Paper, Oxford, 26pp. [see interview here: <http://www.nature.com/nclimate/journal/v2/n4/full/nclimate1457.html>]

\*\* Rockström,J. et al. (2009) A safe operating space for humanity *Nature* 461, 472-474