New Technologies and Catastrophic Risks: Hubris in the Anthropocene

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Fourth Annual Conference of the Governance of Emerging Technologies: Law, Politics and Ethics

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Tempe Mission Palms Hotel and Conference Center, in Tempe, Arizona, on May 24-26, 2016

Session 5.2: Managing New Technology Risks

Moderator: Cynthia Selin, School for the Future of Innovation in Society, ASU

Emerging Technologies and Catastrophic Risks

• Theoretical Grounding:

- Risk Society and Catastrophic Risks (Ulrich Beck)
- Exacerbated by Centralization (Charles Perrow)
- Emerging Technologies Studied
 - "Financialization": Innovative financial contracts and trading technologies
 - New Carbon-Extractive Technologies: Deepwater drilling & Fracking
 - Nuclear Technologies and Innovations: Uranium-backed securities and MOX
- Thesis: Emerging Technology Crises Illustrate Hubris in the Anthropocene:
 - 21st Century Financial Crises; BP Oil Spill; Fukushima Daiichi



Structural Foundations of Risk Society:

Assemblages in Finance & Energy Organized by Extractive Logics and Innovations



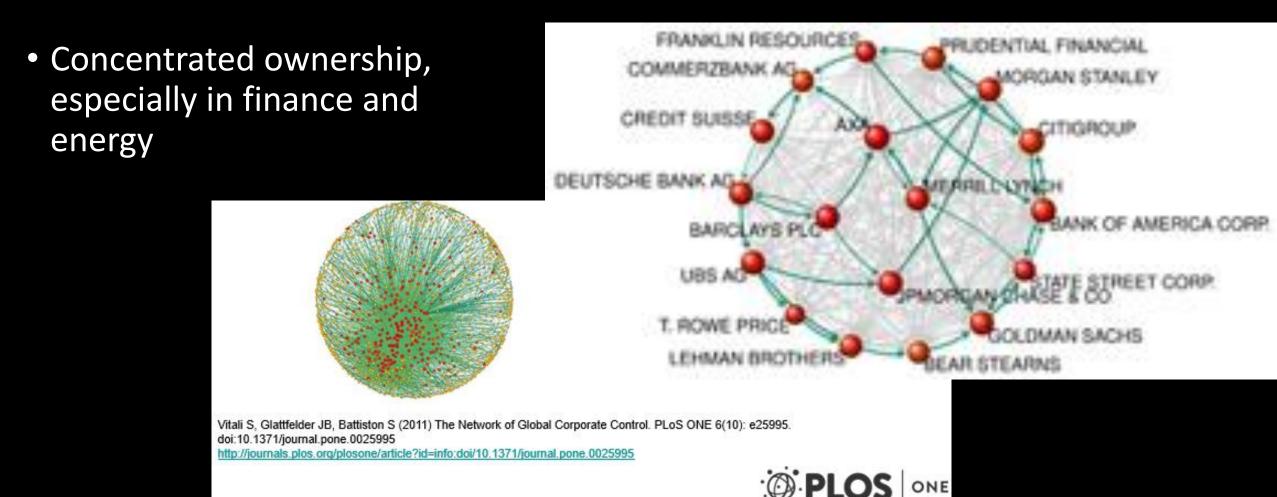
Oil Fields #19a, Belridge, California, USA, 2003







Consolidated Ownership and Decision Making Across Assemblages: Complexes in the Network Society



Consolidated Wealth and Control

- 1318 corps. control 60% of global revenues
- "Super entity" of 147 (financial) corporations, controlled 40% of entire network
- 734 "top holders of stock accumulate 80% of the control over the value of all TNCs"
- "Network control is much more unequally distributed than wealth. In particular, the top ranked actors hold a control ten times bigger than what could be expected based on their wealth" (Vitali, Glattfelder, and Battiston, 36)

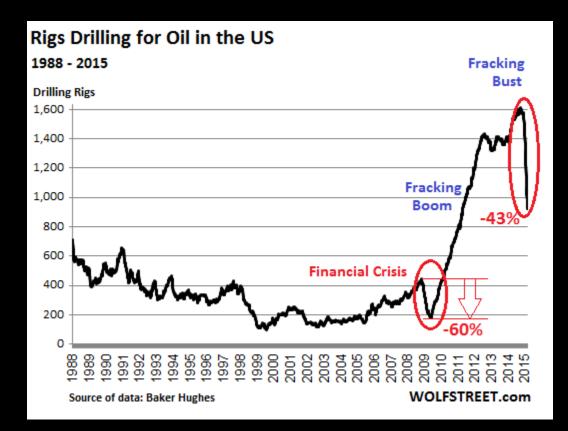
Financial, Oil, and Nuclear Complexes

• Common ownership, organizational logics, and problem-solution frames:

- Risk-seeking & growth dependent
- Innovation around extractive technologies
- Externalize full costs of hazards produced by operations
- "Financialization" amplifying systemic risks (bubbles, over-production, institutionalization)
- Prone to lack of transparency and fraud
- Produces communications that mystify "innovation" and deify corporations
- Regulatory capture

CASE I: Financial Crises 2007-2008 and 2015-Present

- Extractive, Risk-seeking Behavior and Fraud drove (2007-2008) Financial Crisis
 - New financial instruments & algorithmic trading
- Crisis Outcomes: Moral Hazard; More Wealth Consolidation; Commodity Bubble
- Crises Ahead: Bankruptcies in Energy; Declining Living Standards, Environmental Destruction



Zak Slayback. Feb 25 2016. The Fed Fracked The Frackers: How Government Exacerbated the Oil & Gas Bust, https://medium.com/life-learning/the-fed-fracked-the-frackers-how-government-exacerbated-the-oil-gas-bust-2aa44374983d#.aquxeg1vt

CASE II: BP Oil Crisis: 2010 Deepwater Horizon

- Reliance on risky new technology
- Risk seeking culture
- Failures of transparency
- Insider Trading in weeks before accident
- Regulatory capture
- Moral hazard via federal military contracting

"BP Pressing to Head Off Future Claims From Oil Spill" in AZ Republic page 2 July 9, 2011 "BP is arguing that victims of last year's Gulf oil spill should not be paid any more claims for future losses because the areas affected by the spill have recovered and the economy is improving"

Hiltzick 2014



BP: Substantial Shareholder Ownership by Most Connected Corporations (10-12)

2009 annual report, "substantial shareholders": JPMorgan Chase, BlackRock Inc. (which had acquired Barclays Global Investors in 2009), and Legal & General Group Plc.

Bank of America, State Street Global Advisors, Capital Research and Management Company, Vanguard and Franklin Resources

2010 BP relied on 5 financial advisors: Blackstone, Credit Suisse, Goldman Sachs, Morgan Stanley and UBS, with Goldman Sachs serving as BP's lead adviser.



BP: Regulatory Capture

- Clifford Krauss. March 13, 2014. U.S. Agrees to Allow BP Back Into Gulf Waters to Seek Oil. The New York Times
- Steven Mufson. March 13 2014. BP regains ability to bid on leases for U.S. land, water. The Washington Post
- Danielle Ivory, "BP Wins Most Pentagon Fuel Awards in Year After Gulf Explosion," *Bloomberg.Com*, February 24, 2012,
 - BP's contracts with the military surged 33 percent to \$1.35 billion in the fiscal year that ended Sept. 30 from \$1.02 billion in fiscal 2010, according to data compiled by Bloomberg Government. BP received 49 percent more in defense contracts than the No. 2 fuel supplier, San Antonio-based Valero Energy Corp.



Image: Louisiana. The Guardian.

BP: Ubiquitous Long Term Effects

"I've never seen such a high prevalence of very sick animals," said lead author Lori Schwacke, a researcher with the National Oceanic and Atmospheric Administration (NOAA). http://www.japantimes.co.jp/news/2014/02/22/ world/dolphins-in-bad-shape-after-bp-oil-spillstudy/#.UwoRHaWyOf0

Baby Dolphin Deaths Linked to BP Oil

APR 12, 2016 03:59 PM ET // BY KERRY SHERIDAN, AFP



Kerry Sheridan. April 12, 2016. Baby Dolphin Deaths Linked to BP Oil Spill. Discovery, http://news.discovery.com/animals/whales-dolphins/baby-dolphindeaths-linked-to-bp-oil-spill-160412.htm

CASE III: Fukushima Daiichi 2011

- Diet report a "profoundly man made disaster"
- GE and TEPCO had history of accidents and fraud with Mark I reactors
- TEPCO cannot find reactor cores for reactors 1 and 2 despite muon scanning
- Technology does not exist for removing melted fuel. The plant is subject to liquefaction
- The costs were socialized by government



TEPCO Creditors, Equity Owners and Uranium Supply Chains

TEPCO Creditors AND Shareholders:

Mitsubishi UFJ Financial Group Inc., Mizuho Corporate Bank, and Development Bank of Japan. Major Share-holder: Daiichi Life

E.G. MUFG #22 Top Control Corporations

MUFG Group

- > Mitsubishi UFJ Financial Group
- > Bank of Tokyo-Mitsubishi UFJ
- > Mitsubishi UFJ Morgan Stanley

Integration, Centralization and Financialization of Uranium Supply Chains:

Uranium Participation Corporation (UPC) & NUFCOR

2014 Senate report, "Wall Street Bank Involvement with Physical Commodities,"

http://www.tr.mufg.jp/english/aboutmutb/business/corporate.html

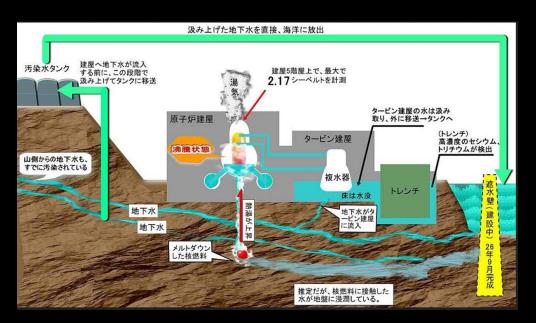
300 tons of contaminated water accumulates daily.

1,000 massive storage tanks generate X-rays

German Risk Study predictions

NUCLEAR WATCHMar. 8, 2015 Echoes of 3.11: Fukushima Daiichi Struggle Continues Noriko Okada

Nuclear Watch, NHK (March 8, 2015), http://www3.nhk.or.jp/nhkworld/english/news/nuclearwatch/20150309.html



Fukushima: A Contaminated-Water Generating Machine but Japan Seeks to Re-Start Idled Reactors & MOX Fuel





EPIDEMIOLOGY

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< Previous Abstract | Next Abstract >

Epidemiology: Post Author Corrections: October 5, 2015 doi: 10.1097/EDE.00000000000385 Original Article: PDF Only

Thyroid Cancer Detection by Ultrasound Among Residents Ages 18 Years and Younger in Fukushima, Japan: 2011 to 2014.

Tsuda, Toshihide; Tokinobu, Akiko; Yamamoto, Eiji; Suzuki, Etsuji

OPEN PAP

- Abstract

Background: After the Great East Japan Earthquake and Tsunami in March 2011, radioactive elements were released from the Fukushima Daiichi Nuclear Power Plant. Based on prior knowledge, concern emerged about whether an increased incidence of thyroid cancer among exposed residents would occur as a result.

Methods: After the release, Fukushima Prefecture performed ultrasound thyroid screening on all residents ages <=18 years. The first round of screening included 298,577 examinees, and a second round began in April 2014. We analyzed the prefecture results from the first and second round up to December 31, 2014, in comparison with the Japanese annual incidence and the incidence within a reference area in Fukushima Prefecture. 54,000 (due to 5yr exclusion zone for areas with 50 mSv year or more radiation exposure (Kasai, 2013 March 11)

Areas 1-19 mSv considered safe

Fukushima's Radiation Refugees



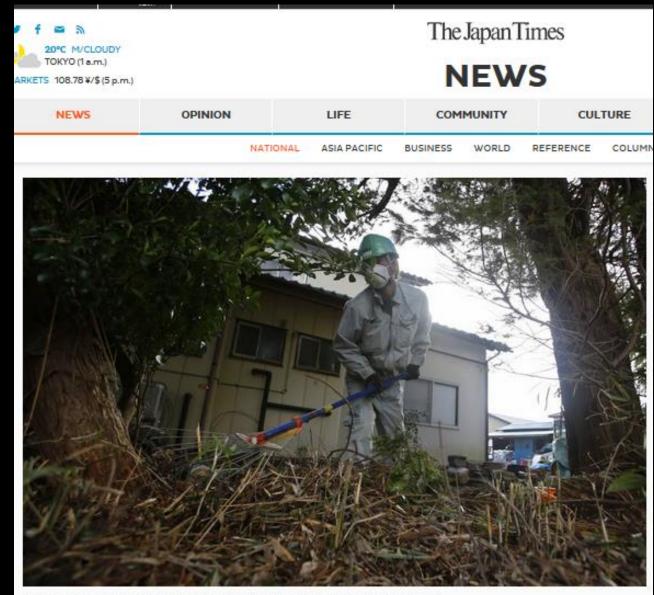
http://thefunambulist.net/2013/08/24/topieimpitoyable-accelerationdeceleration-of-thedeath-process-in-biothanatopolitical-regimes/ https://europasicewolf.wordpress.com/2011/11/10/ discrimination-against-fukushimas-nuclearrefugees/

Dispossessed People

 Fukushima's decontamination workers from the margins of society are being 'exploited' by Mari Yamaguchi AP Mar 12,

2016 <u>http://www.japantimes.co.jp/news/2016/03/12/national/social-</u> <u>issues/fukushimas-decontamination-workers-from-the-margins-of-society-are-being-</u> <u>exploited/#.Vzn5kOSYJmw</u>

• They were simply labeled "decontamination troops" unknown soldiers...



A worker cleans a garden in Minamisoma, Fukushima Prefecture, in February. | AP

NATIONAL / SOCIAL ISSUES

Fukushima's decontamination workers from the margins of society are being 'exploited'

Commonalities Across Case Studies

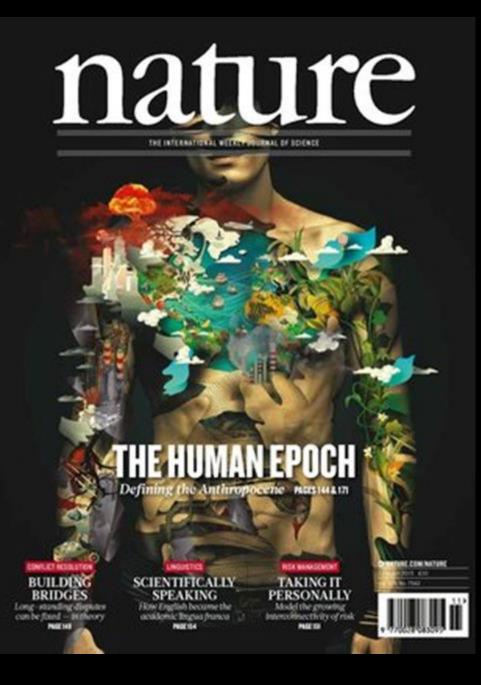
- Centralized ownership
- Centralized decision-making around extractive and externalizing logics
- Risky, innovative technologies
- Hubris and failures of transparency
- Regulatory capture
- Accelerating and irrational ecosystem destruction

Framing of Anthropocene Obscures Institutional Agency



Framing the Anthropocene

- Atmospheric changes in levels of CO₂, methane, nitrate, and lead concentrations delimited in "golden spikes" (1, 2)
- Framing of Anthropocene is a political issue



Exclusive Climate framing dissipates accountability and responsibility:

 "we're all responsible for climate change is the reverse implication that none of us are—that no one in particular can be held to account... It says nothing about inequality. It ignores structural racism and the legacy of imperialism. And it lets capitalism off the hook. " (Forrester 2016)

Anthropocene Deconstructed: Anti-Politics & Thanatopolitics

- Dislocate anonymized framings of Anthropocene
- Identify catastrophic risks from extractive, risky technologies mystified by discourses of innovation
- Reveal "Anti-Politics" (e.g., Purdy After Nature 4)
- Explicate a THANATOPOLITICS of DISPOSSESSION (5), a logic of disregard for the polis and ecological commons, accompanied by extractive and externalizing logics, technologies and ideological communication systems

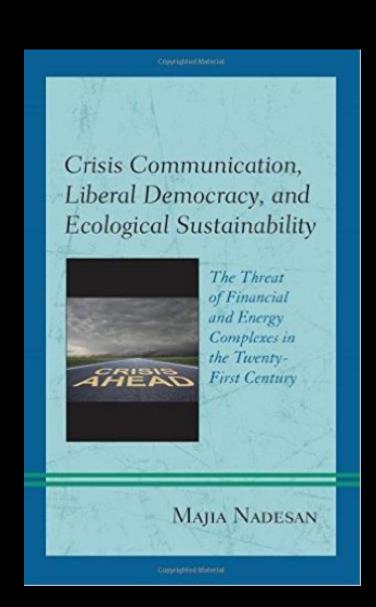
Conclusions: Anthropocene Reframed



- Anti politics and dispossession in Financial Crisis, BP Oil Spill and Fukushima Nuclear Crisis illustrate:
 - Concentrations of ownership, decision-making, and risk
 - Extractive logics and risky deployments of innovative technologies
 - Technological hubris, moral hazard, and propagandistic communication

Primary Resources

- Arguments from presentation published in Nadesan, (2016) Crisis Communication, Liberal Democracy and Ecological Sustainability. Lexington
- Arguments developed secondarily
- Nadesan (2013) *Fukushima and the Privatization of Risk,* Palgrave
- Nadesan, Boys, McKillop, & Wilcox (2014) Fukushima: Dispossession or Denuclearization, Dispossession Press



Endnotes (for sources not otherwise cited on slides)

- 1. Described by Katrina Forrester in "stratigraphic terms—denoting when atmospheric changes significant enough to warrant a break in geological time took place" with a great acceleration in 1954. Katrina Forrester. The Anthropocene Truism. Humans and the environment have never been separable. But what does the idea mean for politics? The Nation, May 12, 2016, <u>http://www.thenation.com/article/the-anthropocene-</u> <u>truism/?utm_source=Sailthru&utm_medium=email&utm_campaign=New%20C</u> <u>ampaign&utm_term=daily</u>
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- 3. The human epoch. Nature 473(7347) (19 May 2011 online) doi:10.1038/473254a

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- 4. Jedediah Purdy. 2015. After Nature: A Politics for the Anthropocene. Harvard University Press.
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- 8. Ulrich Beck, "The Reinvention of Politics: Towards a Theory of Reflexive Modernization" in *Reflexive Modernization: Politics, Tradition and Aesthetics in the Modern Social Order* Ulrich Beck, Anthony Giddens, and Scott Lash eds., 1-55 (Stanford: Stanford University Press, 1994): 5-6.
- 9. Michael Hiltzik. 2014. BP gets slick in trying to undermine gulf oil spill settlement In full-page ads, BP ridicules payouts it believes are undeserved, including \$8 million to famed chef Emeril Lagasse and \$173,000 to an escort service. Los Angeles Times, February 23, 2014, http://articles.latimes.com/2014/feb/23/business/la-fi-hiltzik-20140221

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"Goldman Leads the Old Guard to BP's Defence," *Euroweek* July 16, 2010, accessed January 13, 2016, http://login.ezproxy1.lib.asu.edu/login?url=http://search.proquest.com.ezproxy1.li b.asu.edu/docview/744219355?accountid=4485.

Images (not referenced in Slides)

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 - Noble Drilling Offshore Oil <u>http://oilmanmagazine.com/oilman-archive-1950s-gulf-of-mexico-early-noble-drilling-offshore-rig/</u>
 - Tar sands ('oil' sands). Extreme Energy Initiative <u>http://extremeenergy.org/tar-sands-oil-sands/</u>
 - (Operation Teapot Image) Operation Teapot, Wikipedia <u>https://en.wikipedia.org/wiki/Operation Teapot</u>
 - The J. P. Morgan & Company bank building in Manhattan in 1915. Credit Office for Metropolitan History <u>http://www.nytimes.com/2010/06/26/business/26morgan.html?_r=0</u>
 - APOC https://en.wikipedia.org/wiki/Anglo-Persian_Oil_Company
- Source Slide 22
 - Technological Utopia https://www.surveymonkey.com/r/CMNZ5H2

Additional Information

• Financial Crisis

BP Oil Spill

• Fukushima Crisis

#1 Search Image result for thanatopolitics

Thatantopolitics are not anonymous but derive from logics, strategies, technologies and policies



thanatopolitics

All Maps Videos Shopping



Insider Trading at BP?

- Tony Hayward sold off significant amounts of BP stock weeks before the disaster. Likewise, Goldman Sachs sold off \$250 million of BP stock, constituting 44 percent of their holdings in the first quarter of 2010. Wachovia, owned by Wells Fargo, sold 98 percent of their BP shares and UBS sold 97 percent, although the value of the sales was almost one-half of Goldman's. Jon Swaine and Robert Winnett, "BP Chief Tony Hayward Sold Shares Weeks Before Oil Spill," The Telegraph, June 5, 2010, accessed June 6, 2010, http://www.telegraph.co.uk/finance/newsbysector/energy/oilandgas/7804922/BP-chief-Tony-Hayward-sold-shares-weeks-before-oil-spill.html
- John Byrne, "Goldman Sachs Sold \$250 Million of BP Stock Before," Raw Story, June 2, 2010, accessed June 3, 2010, http://www.rawstory.com/rs/2010/06/month-oil-spill-goldman-sachs-sold-250-million-bp-stock/.

Fukushima: Japanese Diet Report Attributes as Human Wrought Disaster

The Japanese National Diet's "The Official Report of the Fukushima Nuclear Accident Independent Investigation Commission" (2012) executive :

"Although triggered by these cataclysmic events, the subsequent accident at the Fukushima Daiichi Nuclear Power Plant cannot be regarded as a natural disaster. It was a profoundly manmade disaster – that could and should have been foreseen and prevented. And its effects could have been mitigated by a more effective human response... Our report catalogues a multitude of errors and wilful negligence that left the Fukushima plant unprepared for the events of March 11. And it examines serious deficiencies in the response to the accident by TEPCO, regulators and the government."

Uranium Bubble: Uranium Financial Instruments in 2010

- Warwick-Ching, Lucy (March 25, 2010) Nuclear choice: time to invest in uranium? The Financial Times, http://www.ft.com/cms/s/2/3123b600-3610-11df-aa43-00144feabdc0.html#axzz3bvSqrV00
- Canny investors first began to take notice some years ago, when the price of uranium shot up from about \$10 per pound in 2003 to more than \$130/lb in 2007. The global financial meltdown sent it crashing down again, though it has hovered around the mid-\$40s/lb ever since. But experts now believe recent developments could prompt serious price gains.
- "Demand for uranium is on the increase thanks to a number of reactors due to come into operation over the next few years," says Scott Lawrence, head of nuclear fuel at MF Global, the derivatives brokerage. "The growth is concentrated in the emerging economies where nuclear power presents an attractive, low-carbon option for baseload electricity production."
- There are already more than 400 nuclear power stations globally, but the World Nuclear Association predicts hundreds more need to be built to fight global warming. The British government has approved the installation of 10 new nuclear power stations. Decisions on at least as large a scale are expected in Germany, Japan, Italy, China, India and the US.
- ...[Brewin Dolphin analyst Nik Stanojevic] He also makes the point that uranium mining is relatively concentrated.
 "Kazakhstan now represents more than 20 per cent of global mine supply, and the authorities there have stated they intend to swap uranium mining assets for nuclear power stations," he says. "It is in their interests not to allow the price to fall too far and to establish a floor to the uranium price."
- While energy traders have been interested in uranium for years, it has been a relatively closed market for investors. It was not until the New York Mercantile Exchange launched its first-ever uranium futures contract on its CME platform in 2007 that private investors could get really involved.

Fukushima Statute of Limitations Illustrate Externalization

2013, the LDP legislated a ten-year statute of limitations of liabilities for Japanese citizens impacted by the Fukushima disaster. Contamination produced by the plant and the effects of radiation will unfold over decades yet TEPCO's liability is limited to ten years.

Shinichi Sekine, "LDP Seeks to Extend Statute of Limitations for Nuclear Accident Damage Claims to 10 Years," *The Asahi Shimbun*, September 21, 2013, accessed September 23, 2013, http://ajw.asahi.com/article/0311disaster/fukushima/AJ201309210059

Fukushima's Radioactive Hot Spots

 John R. Emshwiller Radioactive Hot Spot Prompts Researchers' Concerns. The Wall Street Journal, April 28, 2016, http://www.wsj.com/articl es/radioactive-hot-spotprompts-researchersconcerns-1461874573



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Opinion: Cavemar

Contractors for the Army Corps of Engineers collect samples at Coldwater Creek in Missouri's St. Louis County in 2015. Private researchers say their sampling suggests contamination from a radioactive hot spot is getting into the creek, then heading to residents MASAKAZU HONDA. **30 groups show** radioactive soil levels to address Fukushima fears. The Asahi Shimbun, May 6, 2016 http://www.asahi.com/ajw/articles/AJ201 605060006.html

- The highest reading so far was 135,000 becquerels of radioactive cesium detected in a forest near a home in the Hiso district of litate village, northwest of the embattled Fukushima No. 1 nuclear power plant.
- The soil sample showed 111,028 becquerels of cesium-137 and 23,920 becquerels of cesium-134.
- Radioactivity readings at many observation spots in Shizuoka Prefecture, which is far from the nuclear plant, were below the lowest detectable level.
- But the survey this year still found sites in the Kanto region, south of the Tohoku region where the Fukushima plant is located, with readings exceeding 10,000 becquerels.







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Rapid communication

Abundance of birds in Fukushima as judged from Chernobyl

Anders Pape Møller^{a,*}, Atsushi Hagiwara^b, Shin Matsui^c, Satoe Kasahara^c, Kencho Kawatsu^d, Isao Nishiumi^e, Hiroyuki Suzuki^f, Keisuke Ueda^c, Timothy A. Mousseau^g

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ARTICLE INFO

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ABSTRACT

The effects of radiation on abundance of common birds in Fukushima can be assessed from the effects of radiation in Chernobyl. Abundance of birds was negatively related to radiation, with a significant difference between Fukushima and Chernobyl. Analysis of 14 species common to the two areas revealed a negative effect of radiation on abundance, differing between areas and species. The relationship between abundance and radiation was more strongly negative in Fukushima than in Chernobyl for the same 14 species, demonstrating a negative consequence of radiation for birds immediately after the accident on 11 March 2011 during the main breeding season in March–July, when individuals work close to their maximum sustainable level.

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Watanabe, Yoshito, San'ei Ichikawa, Masahide Kubota, Junko Hoshino, Yoshihisa Kubota, Kouichi Maruyama, Shoichi Fuma, Isao Kawaguchi, Vasyl Yoschenko, Satoshi Yoshida, "Morphological defects in native Japanese fir trees around the Fukushima Daiichi Nuclear Power Plant," *Scientific Reports* **5**.13232 (2015): doi:10.1038/srep13232.

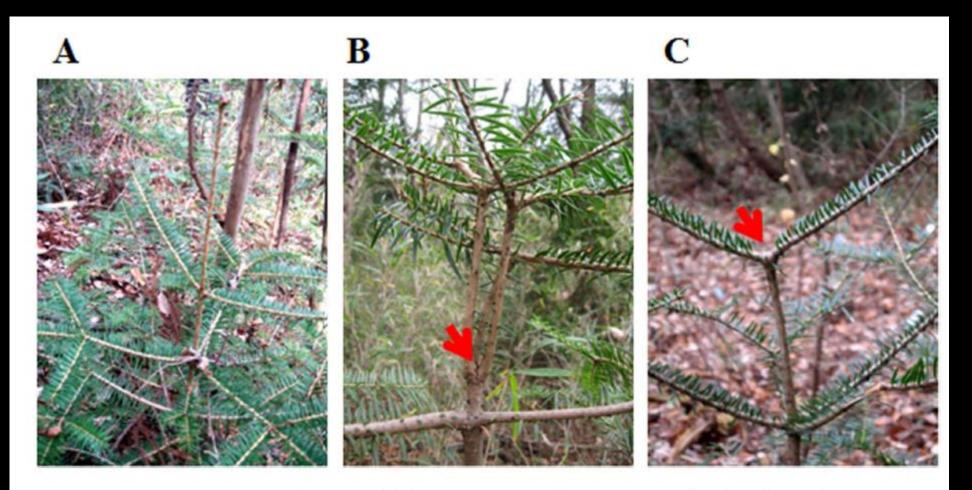


Figure 3. Representative morphological defects in Japanese fir trees. Arrowheads indicate the position of deleted leader shoot. (A) normal tree (S3), (B) defected tree (vertical forking, S1), (C) defected tree (horizontal forking, S2).

Anthropocene Revisited: Risk Society Produced by Heedless Resource Exploitation and Escalating War

Our 21st Century Energy Wars

Global conflicts are increasingly fueled by the desire for oil and natural gas--and the funds they generate by Michael T. Klare

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#1 Image for 21st Century War, Klare, M. (2014, July 8). Our 21st Century Energy Wars, Common Dreams http://www.commondreams.org/views/2014/07/08/our-21st-century-energy-wars

Nasa-funded study: industrial civilisation headed for 'irreversible collapse'?

Natural and social scientists develop new model of how 'perfect storm' of crises could unravel global system



Conclusion from a new cross-disciplinary 'Human And Nature DYnamical' (HANDY) model, led by applied mathematician Safa Motesharrei of the US National Science Foundation-supported <u>National Socio-Environmental Synthesis Center</u>, in association with a team of natural and social scientists. <u>Nafeez Ahmed</u> March 14, 2016 http://www.theguardian.com/environment/earth-insight/2014/mar/14/nasa-civilisationirreversible-collapse-study-scientists