

The Great Simplification

EPISODES ANIMATED SERIES FRANKLY ABOUT

Daniel Pauly: "Peak Fish and Other Ocean Realities"

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Episode 15
April 20, 2022

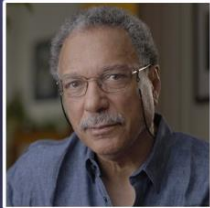
(Conversation Recorded on February 24, 2022.)

On this episode, we meet with Professor at the University of British Columbia and Founder of Sea Around Us, Dr. Daniel Pauly.

Dr. Pauly shares the role warming sea water plays in fish migration. How do warming temperatures affect water oxygen levels and fish behavior?

Dr. Pauly explains that the world has passed peak fish, and why contemporary metrics do not always paint a complete picture of our dire situation.

About Daniel Pauly



Daniel Pauly
Marine Biologist

AUDIO FILES:

https://www.youtube.com/watch?v=Jq_747zFI5w

<https://s3.us-west-2.amazonaws.com/legacy.seaaroundus/TVRadio/2022/The+Great+Simplification+-+April+20%2C+2022+-+Daniel+Pauly+Peak+Fish+and+Other+Ocean+Realities.mp4>

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About Daniel Pauly

Dr. Daniel Pauly is a Killam Professor at the University of British Columbia, the Founder of the Sea Around Us, and author of more than a dozen books.

Show Notes & Links to Learn More

00:45: Daniel Pauly Info + Works

<https://www.seaaroundus.org/daniel-pauly/>

<https://oceans.ubc.ca/daniel-pauly/>

Vanishing Fish: Shifting Baselines and the Future of Global Fisheries -

<https://www.amazon.com/Vanishing-Fish-Shifting-Baselines-Fisheries/dp/1771643986>

More books: https://en.wikipedia.org/wiki/Daniel_Pauly#Publications

02:14: Peak Oil Podcast

<https://www.thegreatsimplification.com/episode/03-arthurberman>

02:31: Peak Fish Catch Worldwide in 1996

<https://www.nature.com/articles/ncomms10244>

03:31: Global fisheries statistics

<https://www.seaaroundus.org/data/#/global?chart=catch-chart&dimension=taxon&measure=tonnage&limit=10>

04:07: Understated declines because of more fisheries opening, making up for declining catches

<https://www.science.org/content/article/official-statistics-understate-global-fish-catch-new-estimate-concludes#:~:text=Commonly%20cited%20statistics%20have%20understated,%25%2C%20a%20new%20tally%20finds.>

04:38: Declined fish catches of 1 million/metric tons per year

<https://deeply.thenewhumanitarian.org/oceans/articles/2018/02/20/study-finds-underreporting-masks-sharp-decline-of-global-fish-catches>

05:03: Fisheries catch 80-90 million tons/year, but real catch of 130 million tons/year

<https://www.nature.com/articles/ncomms10244>

05:28: 15% declines in catch since 1996 in salt water fish

<https://www.sciencedirect.com/science/article/pii/S0308597X17306334>

10:20: Early humans migrated along coastlines

<https://www.worldhistory.org/article/1070/early-human-migration/>

11:04: When moving inland, humans wiped out most large mammals

<https://www.sciencedaily.com/releases/2001/06/010608081621.htm#:~:text=Summary%3A,sophisticated%20computer%20model%20to%20date.>

12:05: We then shifted to agriculture which shifted vegetation on the landscape

<https://www.frontiersin.org/articles/10.3389/fpls.2020.592881/full>

12:28: Beginning of fossil energy use exploded fishing practices and accessibility

<https://onlinelibrary.wiley.com/doi/10.1111/faf.12087>

13:12: Daniel Pauly paper on peak oil and peak fish (2013)

<https://www.nature.com/articles/494303a>

13:41: Heavy subsidies enable fisheries in the high seas

[Are bad subsidies linked to slavery in fisheries?](#)

14:22: Smaller scale fisheries could produce the same amount of fish as large scale ones, and do it better

<https://www.fao.org/voluntary-guidelines-small-scale-fisheries/ihh/en/>

15:08: Activism initiatives supporting small scale fisheries (WTO)

<https://ejfoundation.org/news-media/25-reasons-why-the-wto-must-end-subsidies-that-drive-overfishing>

https://www.wto.org/english/tratop_e/rulesneg_e/fish_e/fish_e.htm

16:08: The amount of time to recover fish stocks

<https://www.nationalgeographic.com/history/article/160328-fisheries-reform-catch-shares-fishing-science-conservation>

16:48: The US has been very successful at replenishing fishery stocks, mostly due to privilege

<https://www.pnas.org/doi/10.1073/pnas.1604982113>

17:34: Shifting Baselines

<https://s3-us-west-2.amazonaws.com/legacy.seaaroundus/doc/Researcher+Publications/dpauly/PDF/1995/Journal+Articles/Anecdotes%26ShiftingBaselineSyndromeFisheries.pdf>

21:35: 1950 as a baseline for fisheries

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1636108/>

23:09: Discount rates

<https://read.realityblind.world/view/975731937/96/>

23:49: Climate change's effects on the ocean (Put podcast in here as well)

<https://www.nhm.ac.uk/discover/quick-questions/how-does-climate-change-affect-the-ocean.html#:~:text=Climate%20change%20warms%20the%20ocean,salinity%20of%20the%20ocean%2C%20respectively.>

<https://www.thegreatsimplification.com/episode/08-peter-ward>

25:46: Fish need to work to breathe the oxygen out of the water and they need it to digest

<https://oceanconservancy.org/blog/2020/01/17/gills/>

26:18: Gills extract 80% of oxygen

https://en.wikipedia.org/wiki/Fish_gill#:~:text=The%20effect%20of%20this%20is,oxygen%20available%20in%20the%20water.

27:10: Ocean oxygen has dropped 2%

<https://www.iucn.org/resources/issues-briefs/ocean-deoxygenation#:~:text=Globally%2C%20oceans%20have%20lost%20around,is%20predicted%20to%20vary%20regionally.>

27:26: As ocean temperature increase, fish need more oxygen

<http://bit.ly/shrinkingfish>

27:34: Ocean temperature increasing

<https://www.iucn.org/resources/issues-briefs/ocean-warming>

27:51: Gill Oxygen Limitation Theory

<https://www.science.org/doi/10.1126/sciadv.abc6050>

28:39: Homeostasis

<https://www.scientificamerican.com/article/what-is-homeostasis/>

29:05: Temperature is 1-1.5 degrees Celsius warmer globally

<https://www.climate.gov/news-features/understanding-climate/climate-change-global->

[temperature#:~:text=August%2012%2C%202021-.Highlights,land%20areas%20were%20record%20warm.](#)

29:33: Fish populations have moved polewards

[https://www.zmescience.com/science/marine-species-move-to-poles-8174132/#:~:text=An%20analysis%20of%20more%20than,shifts%20in%20suitable%20living%20areas.](#)

32:22: Equator countries will be hit the hardest by these changes

[https://www.science.org/content/article/warming-oceans-are-hurting-seafood-supply-and-things-are-getting-worse](#)

32:48: Salmon in California are gone

[https://www.smithsonianmag.com/science-nature/on-californias-coast-farewell-to-the-king-salmon-11992359/](#)

33:38: Over forecast of fossil fuels remaining

[https://read.realityblind.world/view/975731937/270/](#)

33:42: Bio-feedbacks are underestimated

[https://www.climaterealityproject.org/blog/how-feedback-loops-are-making-climate-crisis-worse](#)

34:10: Pauly's paper on changes mean temperature of the catch

[https://www.semanticscholar.org/paper/Changes-in-the-%E2%80%98-Mean-Temperature-of-the-Catch-%E2%80%99-%3A-Keskin-Pauly/9038c9164f994b0009926ecd36977335d536fa75](#)

37:28: Map of how fish have migrated over the years

[https://www.searoundus.org/fish-alter-migration-patterns-as-global-waters-warm/](#)

38:04: Methane release in the tundra

[https://en.wikipedia.org/wiki/Arctic_methane_emissions#:~:text=Arctic%20methane%20release%20is%20the,its%20a%20powerful%20greenhouse%20gas.](#)

38:53: High temperature tolerant fish

[https://theconversation.com/a-tropical-fish-evolved-to-endure-rising-temperatures-but-it-may-not-be-fast-enough-to-survive-climate-change-151948](#)

43:02: Trawling and other destructive fishing practices

[https://bit.ly/btreportsau](#)

43:22: Marine protected areas

[https://marineprotectedareas.noaa.gov/understanding.html](#)

44:37: Steven Magnuson Act

[https://www.fisheries.noaa.gov/resource/document/magnuson-stevens-fishery-conservation-and-management-act](#)

47:45: Sea Around Us

[https://www.searoundus.org/](#)

47:56: Rachel Carson The Silent Spring

[https://www.rachelcarson.org/SilentSpring.aspx](#)

49:33: Small scale fisheries are $\frac{1}{3}$ of all fisheries

<https://onlinelibrary.wiley.com/doi/full/10.1111/faf.12602>

53:24: Fish farms

https://en.wikipedia.org/wiki/Fish_farming

53:41: Carnivorous fish do not reduce pressure on fisheries

<https://news.stanford.edu/pr/00/fishfarms628.html>

54:49: Colorant added to salmon

<https://qz.com/358811/heres-why-your-farmed-salmon-has-color-added-to-it/>

55:12: Sardines in the North Sea are getting smaller

<https://www.dailymail.co.uk/sciencetech/article-7978947/Sardines-two-thirds-SMALLER-12-years-ago-climate-change.html>

Link to the podcast's website:

<https://www.thegreatsimplification.com/episode/15-daniel-pauly>