

# Educating in the age of the Anthropocene & AI

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# Living in the Anthropocene – Multiple Crises overlap

- working together and educating for survival has become vital.
- Anthropogenic climate warming results in a range of climatic consequences - largely caused by increased greenhouse gases especially from CO2 emissions from burning fossil fuels, & methane.
- ecosystem changes and degradation with mass extinction of our wildlife and biodiversity; plastics are in all our oceans now
- Huge increase in world population – is 10 billion sustainable? ‘Carrying capacity’
- Pandemics – Covid & future dangers
- multiple military conflicts; UNHCR estimates that 117.2 million people will be forcibly displaced or stateless in 2023,
- dangers of World War III erupting amid the nuclear threat hang over us all.
- Financial crises
- recent advent of AI Large Language Model (LLM) chatbot systems such as ChaptGPT4 – excitement & useful but fears of massive unemployment - danah boyd ‘Camp Automation vs Camp Augmentation’

# Existential Crisis

- It is no surprise that an increased level of fear and anxiety has developed post-Covid 19, about an existential crisis with the possible collapse of our civilisation in the near future.
- While this may be alarmist and some scenarios seem extreme with many of the hallmarks of a moral panic (Cohen, 1973) - multiple protests by people of all ages (e.g. Extinction Rebellion, Just Stop Oil, School Strikes)
- Many young people around the world blame the current older generation. All of this creates a very real existential crisis for so many people that is too important to dismiss and needs exploring.
- While some in philosophy and education may not want 'to follow the science' as Greta Thunberg exhorts, challenging those who refute or deny the contemporary climatic and environmental changes in our world, it is vital that philosophy of education engages with current world issues, which have ramifications that are practical, economic, political, philosophical, existential, moral and ethical for us all – after all there is no Planet B.



# The Anthropocene

## Holocene to Anthropocene – changes

Holocene inter-glacial warming period began about 12,000 years ago at the end of the Pleistocene geological time period, where the series of seven cyclic climate changes in the last 650,000 years are related to 'very small variations of Earth's orbit that change the amount of solar energy our planet receives'.



### BUT

- IPCC, NASA & many scientific reports - What is verifiably different now, with 95% probability, that since the mid 20th century current warming results from human activity - it is anthropogenic

# Anthropocene – defining an epoch

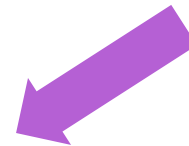
current era - first labelled the 'Anthropocene' by the atmospheric chemist and 1995 Nobel laureate **Paul Crutzen in 2000** who discovered the ozone hole.



International Union of Geological Sciences (IUGS) convened a group of scholars to decide by 2016 whether to officially declare that the Holocene is over and the Anthropocene has begun.



Data and evidence gathered from multiple sources: ice-core samples, satellites, paleontology records and so on. Greenhouse gases we emit continue to increase and sea level rises have accelerated.



Challenges to the data have generally been from business interests (or self-interests) and political sources, especially in USA, related to fossil fuels, rather than from a few science sceptics and the consensus about change has grown over time as more evidence has been presented.

# Anthropocene – defining an epoch



- Naming geologic epochs resides with the **International Commission on Stratigraphy (ICS)** and is ratified by the **International Union of Geological Sciences (IUGS)**.
- 2016, Waters et al, co-authored article by a 24 person working group in *Science* ‘The Anthropocene is functionally and stratigraphically distinct from the Holocene’ pointed out that this was not simply a fluctuation. The abstract states they reviewed:

*Climatic, biological, and geochemical signatures of human activity in sediments and ice cores. Combined with deposits of new materials and radionuclides, as well as human-caused modification of sedimentary processes, the Anthropocene stands alone stratigraphically as a new epoch beginning sometime in the mid-20th century.*

# Anthropocene – ‘the golden spike’

- But to be formally named, evidence from sediment core samples must show ‘the golden spike’ – a major environmental change clearly through

*‘a chemical or biological trace in the strata, which acts as the physical evidence of where one unit stops and another begins.’*

- The mid 20th century is favoured as the starting point for the Anthropocene, with what Jan Zalasiewicz called ‘**the bomb spike**’:

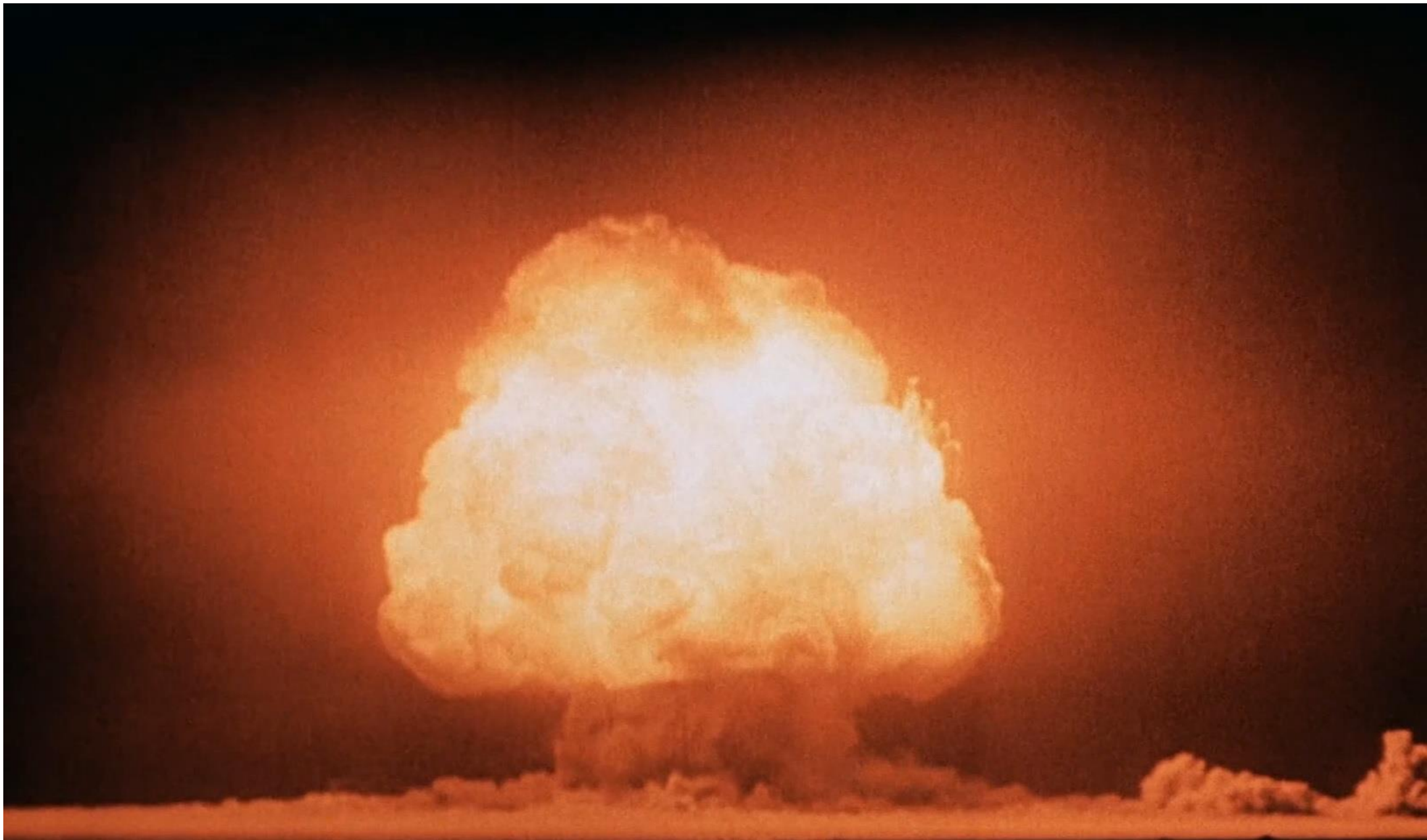
*From the pragmatic stratigraphic perspective, no marker is as distinct, or more globally synchronous, than the radioactive fallout from the use of nuclear weapons that began with the US army’s Trinity test in 1945. Since the early 1950s, this memento of humankind’s darkest self-destructive impulses has settled on the Earth’s surface like icing sugar on a sponge cake. Plotted on a graph, the radioactive fallout leaps up like an explosion. (Davison, 2019)*

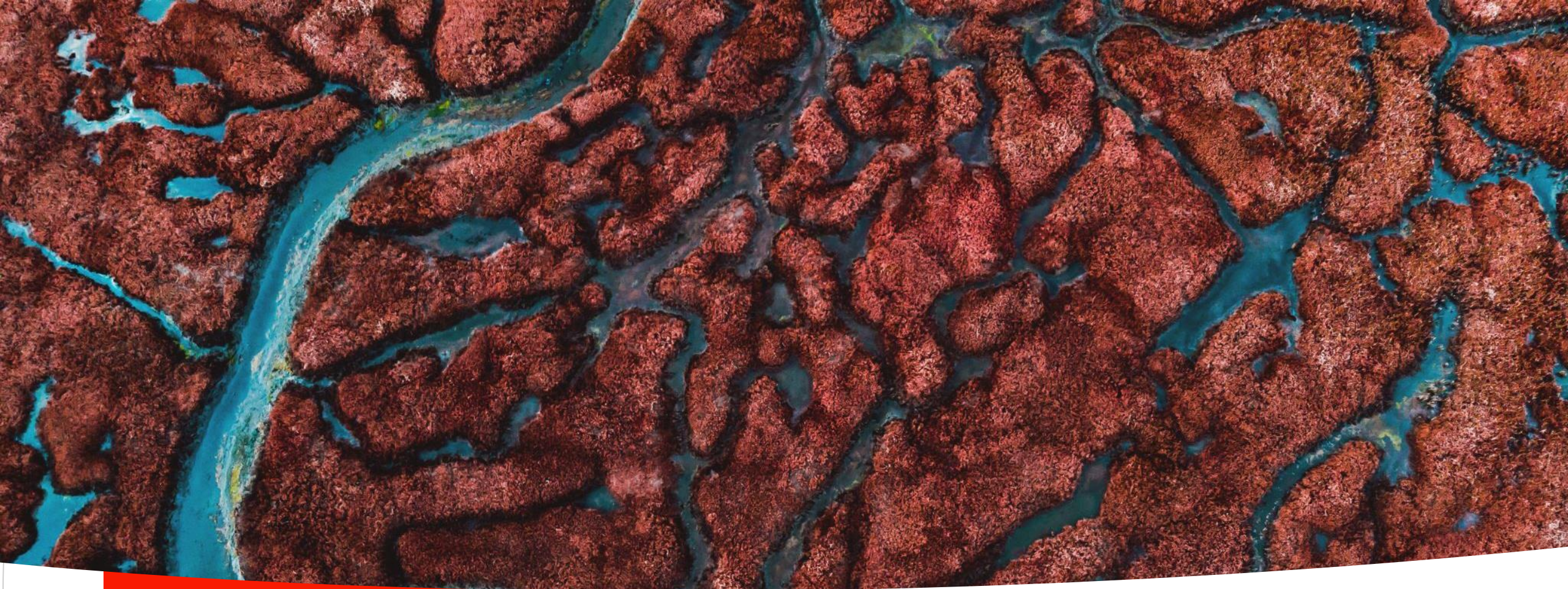


# Trinity

- Trinity - code name of the first detonation of a nuclear weapon, called 'Gadget'.
- conducted by the United States Army at 5:29 a.m. on July 16, 1945, at the Trinity Site in the Jornada del Muerto desert of New Mexico as part of the Manhattan Project
- the bomb was placed atop a 100-foot (30.48 m) tall steel tower that was designated Zero. Ground Zero was at the foot of the tower.
- Photos: detonation & Mushroom cloud of 'Gadget' over Trinity, seconds after detonation – US Department of Energy







# The Anthropocene

- The Anthropocene is a proposed geological epoch that recognizes the significant impact of human activities on Earth's ecosystems and geological processes. It suggests that human activities have become a dominant force shaping the planet, surpassing the influence of natural processes.



## Life and death in the Anthropocene

- Tina Besley & Michael A. Peters (2020) Life and death in the Anthropocene: Educating for survival amid climate and ecosystem changes and potential civilisation collapse, *Educational Philosophy and Theory*, 52:13, 1347-1357, DOI: [10.1080/00131857.2019.1684804](https://doi.org/10.1080/00131857.2019.1684804)
- <https://pesaagora.com/epat/life-and-death-in-the-anthropocene/>
- Things have moved quickly in just 3 years since publication, so it is timely to revisit.

## Besley & Peters on the Anthropocene – educating for survival

Critique of dominant educational paradigms in education and their limitations in addressing the challenges of the Anthropocene.

They question the emphasis on instrumental rationality, reductionism, and human exceptionalism in traditional educational approaches.

Photo by [Gyan Shahane](#) on [Unsplash](#)



## Multiple areas to Consider

- Science/ data / evidence – reliable reputable sources
- Policies – international - global & local
- Politics geopolitical/ national/ local
- Economics – costs/ who pays e.g. managed retreat; ETC; reforestation; energy systems etc
- Psychological/Emotional/Social aspects & attitudes
- Philosophical ideas – the good life; sufficiency; ethics rights & responsibilities
- Physical – rural & urban impacts
- Practical & pragmatic - what can be done now/ in future
- Survival skills - in emergency and in future
- Questions????

# Intergovernmental Panel on Climate Change IPCC

- Intergovernmental Panel on Climate Change (IPCC) - **Paris Agreement** and updated in 2018:
- In order to keep below 1.5C of warming, the aspiration of the world's nations, we need to halve emissions by 2030 and reach zero by mid century. It is also likely we will need to remove CO2 from the atmosphere, perhaps by the large-scale restoration of nature. It is a huge task, but we hope that tracking the daily rise of CO2 will help to maintain focus on it.





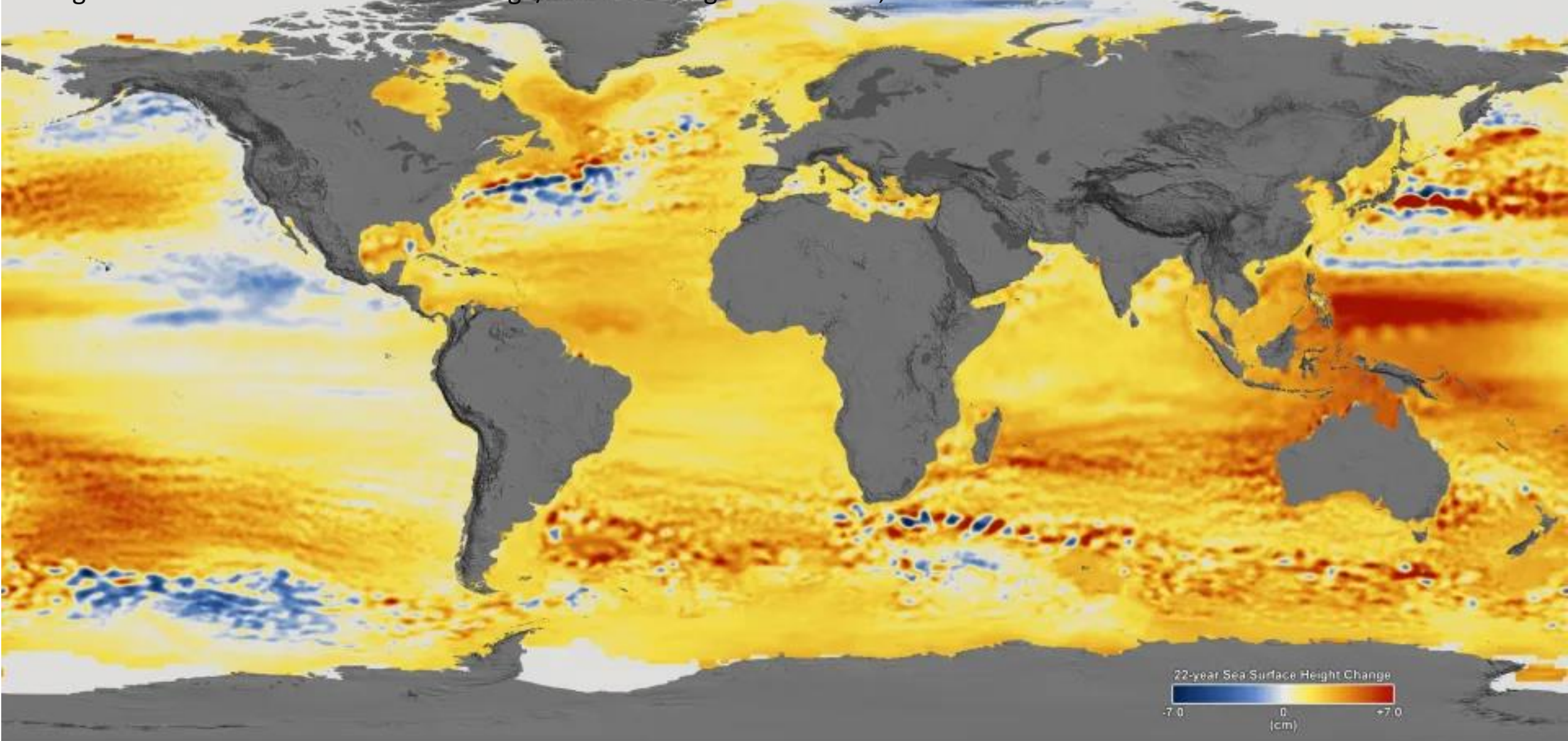
# Sea Level Rises

- In the 20th century it's estimated that the mean global sea level rose by **11-16 cm**.
- According to the projections, 70% of the people that will be affected by rising sea levels are located in just eight Asian countries: China, Bangladesh, India, Vietnam, Indonesia, Thailand, the Philippines, and Japan. 24/06/2022
- <https://www.visualcapitalist.com/cp/sea-level-rises-2100-by-region/#:~:text=According%20to%20the%20projections%2C%2070,%2C%20the%20Philippines%2C%20and%20Japan.>
- Provides a series of visualisations by **Florent Lavergne**, to see how rising sea levels could impact countries in terms of flood risk by the year 2100.

## Sea Level Rise Map Viewer - NOAA

- gives users a way to visualize community-level impacts from coastal flooding or sea level rise (up to 10 feet above average high tides). Photo simulations of how future flooding might impact local landmarks are also provided, as well as data related to water depth, connectivity, flood frequency, socio-economic vulnerability, wetland loss and migration, and mapping confidence. The viewer shows areas along the contiguous United States coast, except for the Great Lakes.
- <https://www.climate.gov/maps-data/dataset/sea-level-rise-map-viewer>

Changes in sea level 1992 and 2014. Orange/red colors -higher sea levels, blue colors show where sea levels are lower -NASA.



# The Anthropocene

Some suggestions for educating for survival

Photo by [Elliott Van Buggenhout](#) on [Unsplash](#)





How to educate in the Anthropocene?

# 1. Foster ecological literacy

Promote a deep understanding of ecological systems and their interconnectedness. Help students grasp the complexity and fragility of ecosystems, emphasizing the importance of biodiversity and the ecological services they provide.



## 2. Critical thinking and agency

...is vitally important in addressing the challenges of the Anthropocene and especially with the rise of AI, misinformation & disinformation. How do we ascertain the truth of statements/ verification of data? How to analyze environmental issues critically, evaluate evidence, and propose innovative solutions.

Adopt educational approaches that empower individuals to think critically, challenge prevailing narratives, and take action to create positive changes.





### 3. Ecopedagogy & Ecosophy

**Ecopedagogy**, an educational approach that integrates ecological awareness, sustainability, and social justice.

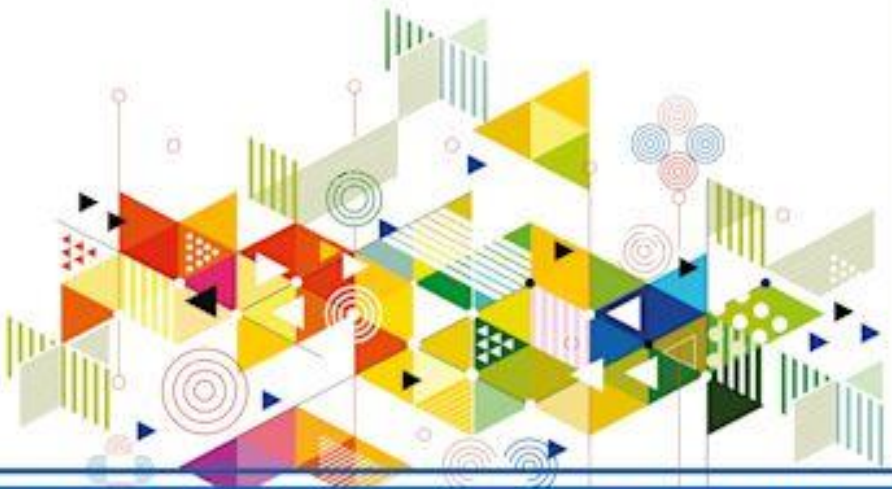
**Ecosophy** - a philosophy or worldview that recognizes the interdependence of humans and the environment; ecological harmony or equilibrium. (after Félix Guattari & Norwegian father of deep ecology, Arne Næss).



Greg William Misiaszek

# ECOPEDAGOGY

Critical Environmental Teaching  
for Planetary Justice and Global  
Sustainable Development



BLOOMSBURY CRITICAL EDUCATION

BLOOMSBURY

- Ecopedagogy is critical, transformative education for praxis that aims at ending socio-environmental injustices and the human dominance of Nature, countering teaching that separates social and environmental violence, and distances us, as humans, from the rest of nature. Plural in definition, I argue, with others, the concept of ecopedagogies emerged from Paulo Freire's work on popular education, both from his later work directly, and from Freireans' reinventions. Freire, as a literacy educator, argued that education should teach students to read the world critically. Ecopedagogy widens that reading to all of the Earth, with the world (the anthropocentric sphere) as part of Earth (the planetary sphere), thus developing in students an *ecopedagogical literacy*. Environmental teaching too frequently relies on 'banking' models that are non-dialectic, non-democratic, non-contextual and non-critical, leading to understanding and problem-solving that is superficial. Without education that reads critically for the actual roots of environmental ills, their causes remain unknown, and effective problem-solving, impossible.

Misiaszek, G. (2020). Ecopedagogy. PESA Agora  
<https://pesaagora.com/ideas/ecopedagogy/>

## 4. Promote sustainability

Make sustainability a core theme in education. Teach students about sustainable development, renewable energy, resource conservation, waste reduction, and responsible consumption. Encourage them to think critically about the impact of their choices and develop environmentally conscious behaviors.

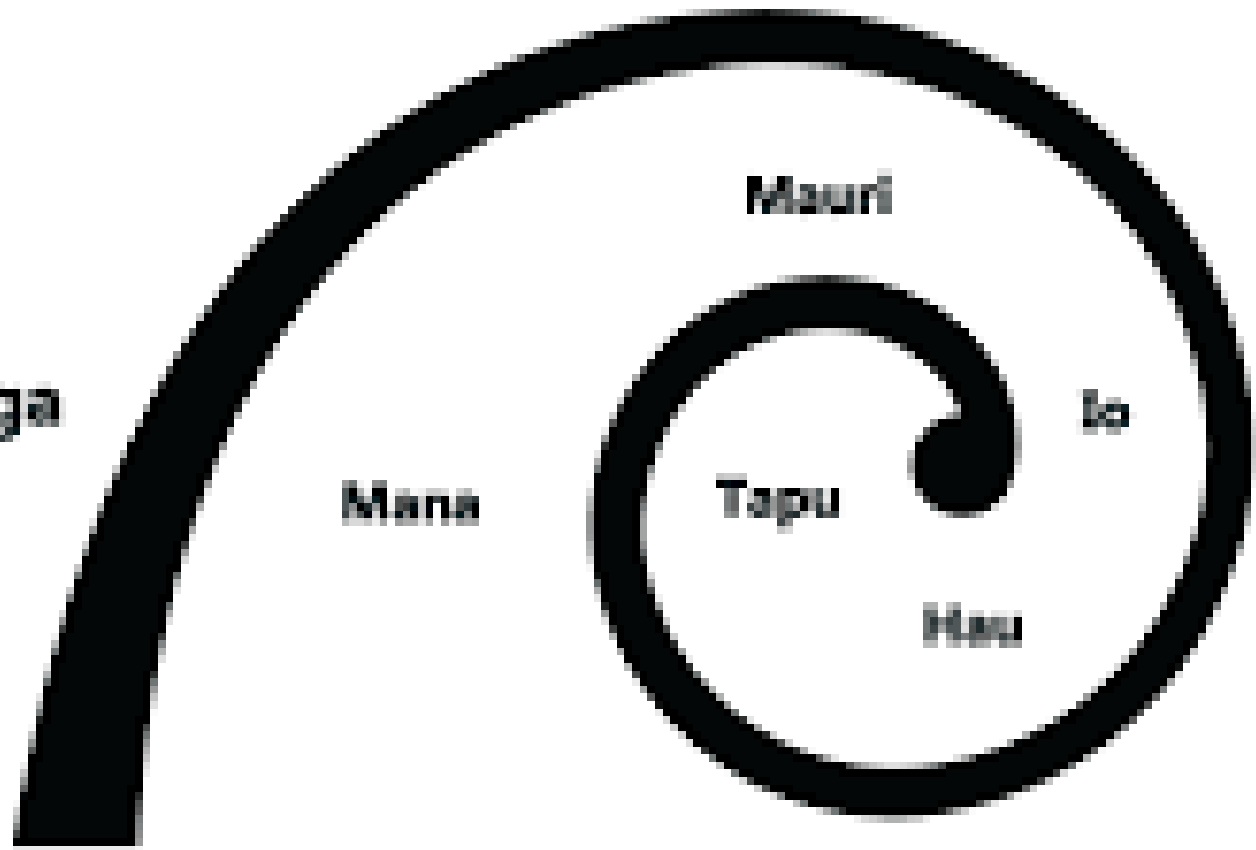


## 5. Encourage systems thinking

- Teach students to think holistically and understand the complex interactions between social, economic, and environmental systems.
- Emphasize the interdependence between humans and the natural world, and the long-term consequences of human actions.
- e.g. The Māori world view (te ao Māori) acknowledges the interconnectedness and interrelationship of all living and non-living things.



**Wairuatanga**  
**Spirituality**



**Kotahitanga**  
**Unity**

**Mana**

**Tapu**

**Io**

**Whanaungatanga**  
**Kinship**

**Hau**

**Kaitiakitanga**  
**Guardianship**

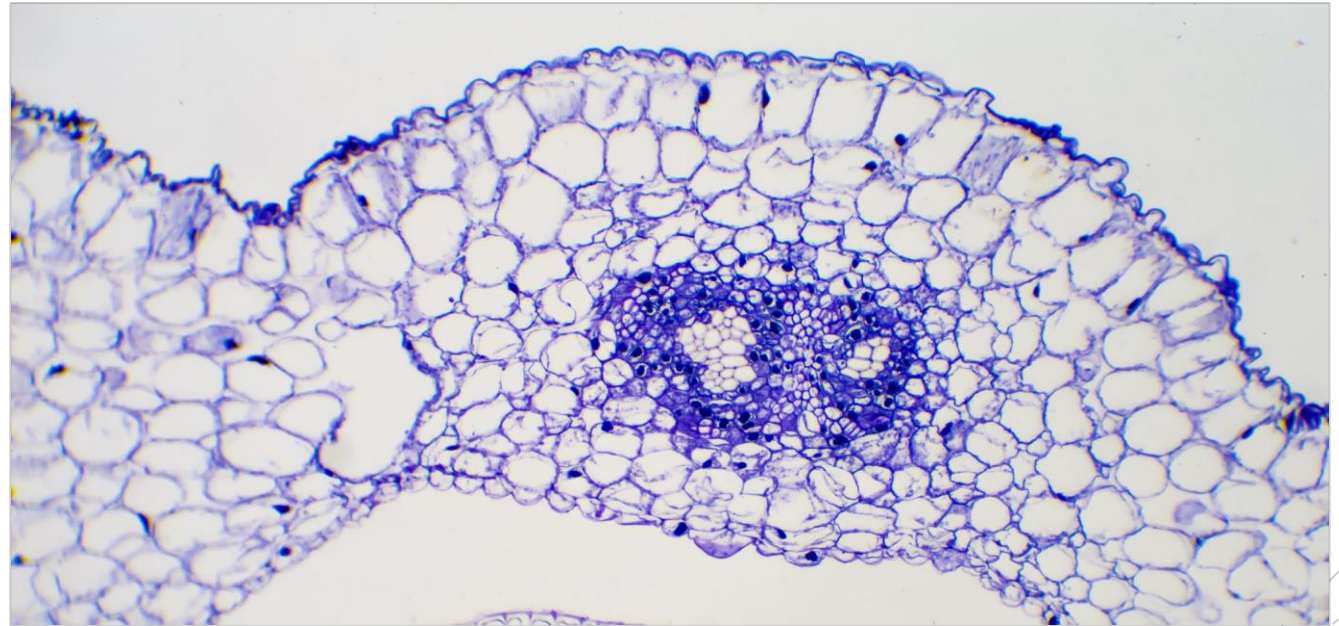
## 6. Ethics and responsibility

- Consider and promote ethical dimensions of the Anthropocene.
- educational institutions need to foster a sense of responsibility, care, and ethical engagement with the natural world & indigenous societies.
- We argue for a shift in educational values and practices that prioritize sustainability, environmental stewardship, and intergenerational justice.



## 7. Posthumanism and non- anthropocentric perspectives

- We question the anthropocentric biases in education and argue for the inclusion of non-human perspectives and the recognition of the agency and intrinsic value of non-human beings and ecosystems.
- With AI this becomes much more apparent and useful albeit challenging for many people to grasp.



## 8. Cultivate a sense of stewardship

- Foster a sense of responsibility and care for the Earth. Encourage students to become active stewards of the environment, empowering them to take actions that promote conservation and environmental protection.
- Many indigenous people hold views that differ from mainstream. As tangata whenua (people of the land), Māori see themselves as guardians (kaitiaki) of the earth, with the responsibility to care for, protect and maintain the environment for future generations.





## 9. Develop interdisciplinary approaches

Encourage cross-disciplinary learning, integrating knowledge and perspectives from various fields such as science, social sciences, humanities, and arts.

An interdisciplinary approach helps students develop a comprehensive understanding of environmental challenges and solutions.



## 10. Encourage critical thinking and problem-solving

Teach students to analyze environmental issues critically, evaluate evidence, and propose innovative solutions.

Foster creativity and resilience to address the complex challenges posed by the Anthropocene.

advocate for the cultivation of active citizenship and environmental activism.



## 11. Foster collaboration and collective action

- Emphasize the importance of collaboration and collective action in addressing global environmental challenges.
- Encourage students to work together, engage in advocacy, and participate in initiatives aimed at creating positive change.



## 12. Incorporate real-world experiences

- Provide opportunities for students to engage in hands-on experiences, fieldwork, and community projects related to environmental issues.
- This allows them to witness firsthand the impact of human activities on ecosystems and develop a personal connection to the natural world.





## 13. Teach Practical Survival skills for everyday & emergency



Keep an emergency kit nearby

Home fire escape plans; earthquake drills

Home vegetable garden

### Teach Basic Survival Skills

- 1: Fire - build a fire - light, warmth, cooking
- 2: Shelter – build one asap to avoid hypothermia
- 3: Signaling - Read a map - compass; solar batteries for radio, GPS
- 4: Food & Water. ... Cook outdoors; Find, collect, food & water and potable water is essential for survival in the wilderness.
- 5: First Aid.
- 6. Use tools etc– pocket knife & tie knots

## 14. Cultivate empathy and environmental ethics

Help students develop a deep sense of empathy for all living beings, respect for different cultural viewpoints and an understanding of the ethical dimensions of environmental issues.

Encourage discussions about environmental justice, equity, and the rights of future generations.



## 15. Emphasize hope and agency



- Provide students with examples of successful environmental initiatives and stories of individuals making a difference.
- Foster a sense of hope and empower students to believe in their ability to contribute to a sustainable future.

## Last word -Going forwards...

Remember, educating in the Anthropocene is an ongoing process that requires adaptation and a commitment to staying informed about the latest scientific findings and best practices & solving problems that are revealed.

We can do.

We must do it!

This is our only planet





1. Crutzen, P. J. (2002). Geology of mankind. *Nature*, 415(6867), 23. - This article by Paul J. Crutzen, a Nobel laureate in chemistry, is widely credited with popularizing the term "Anthropocene." It discusses the scale and magnitude of human influence on the Earth system and proposes that the current epoch should be considered a new geological epoch.
2. Steffen, W., Crutzen, P. J., & McNeill, J. R. (2007). The Anthropocene: Are humans now overwhelming the great forces of nature? *Ambio*, 36(8), 614-621. - This paper explores the concept of the Anthropocene in more detail, discussing the evidence for human-induced changes in the Earth system and the implications for future planetary stewardship.
3. Zalasiewicz, J., Waters, C. N., Williams, M., Barnosky, A. D., Cearreta, A., Crutzen, P., ... & Revkin, A. (2015). When did the Anthropocene begin? A mid-twentieth century boundary level is stratigraphically optimal. *Quaternary International*, 383, 196-203. - This paper discusses the stratigraphic and geological evidence for establishing a boundary marker for the beginning of the Anthropocene, suggesting the mid-twentieth century as a potential reference point.
4. Waters, C. N., Zalasiewicz, J., Summerhayes, C., Barnosky, A. D., Poirier, C., Gałuszka, A., ... & Steffen, W. (2016). The Anthropocene is functionally and stratigraphically distinct from the Holocene. *Science*, 351(6269), aad2622. - This article provides a comprehensive review of the evidence supporting the distinction between the Anthropocene and the Holocene, highlighting the changes in biotic, sedimentary, and geochemical records that indicate a new epoch.
5. Lewis, S. L., & Maslin, M. A. (2018). Defining the Anthropocene. *Nature*, 558(7710), 192-196. - This paper explores different perspectives on defining the Anthropocene, including the geological, ecological, and socio-cultural aspects. It highlights the ongoing debates and challenges associated with establishing a precise start date for the Anthropocene.

These references provide a starting point for understanding the concept of the Anthropocene and its scientific basis. They delve into the evidence and discussions surrounding the proposed epoch, emphasizing the significant impact of human activities on Earth's systems.