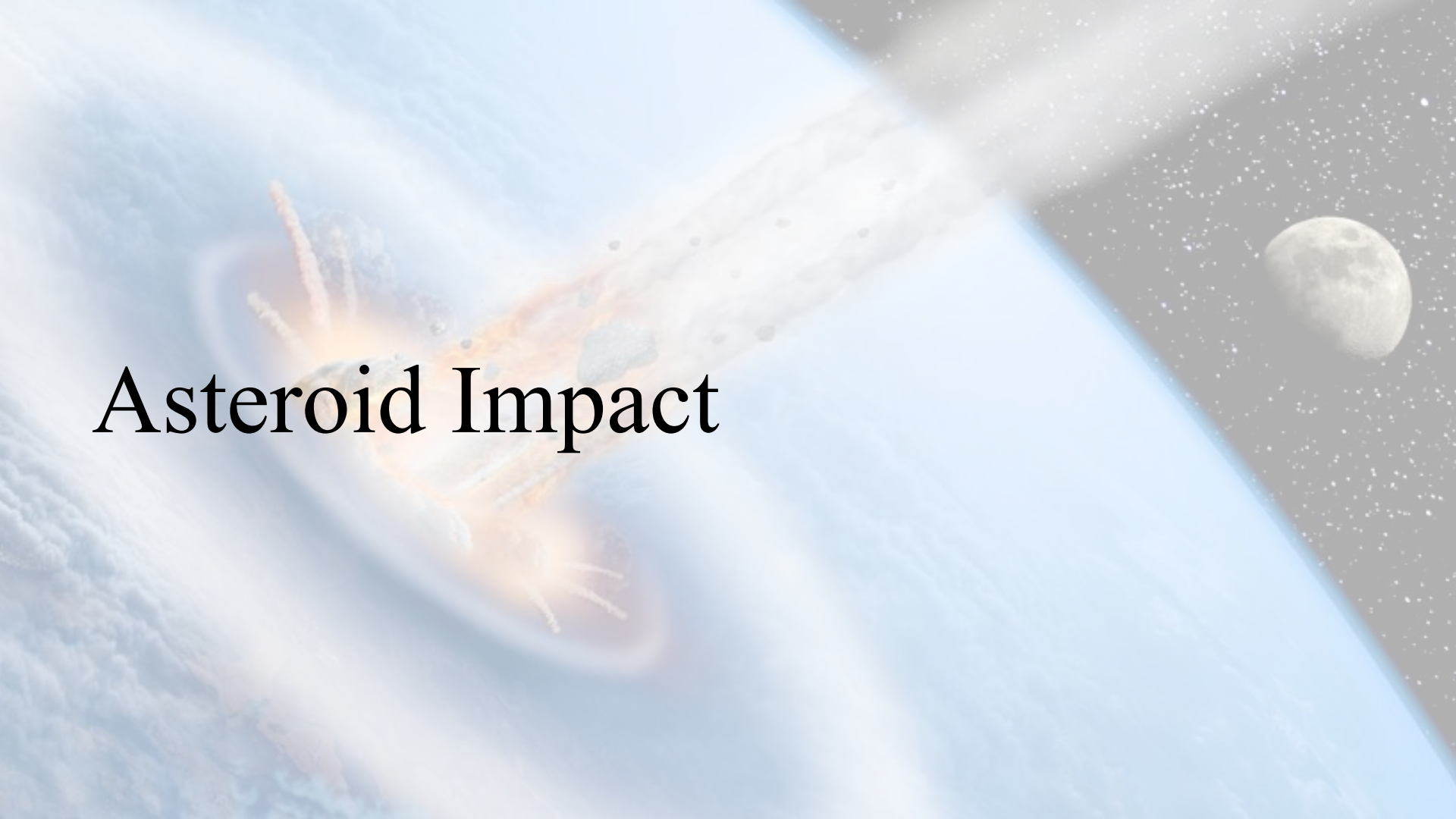
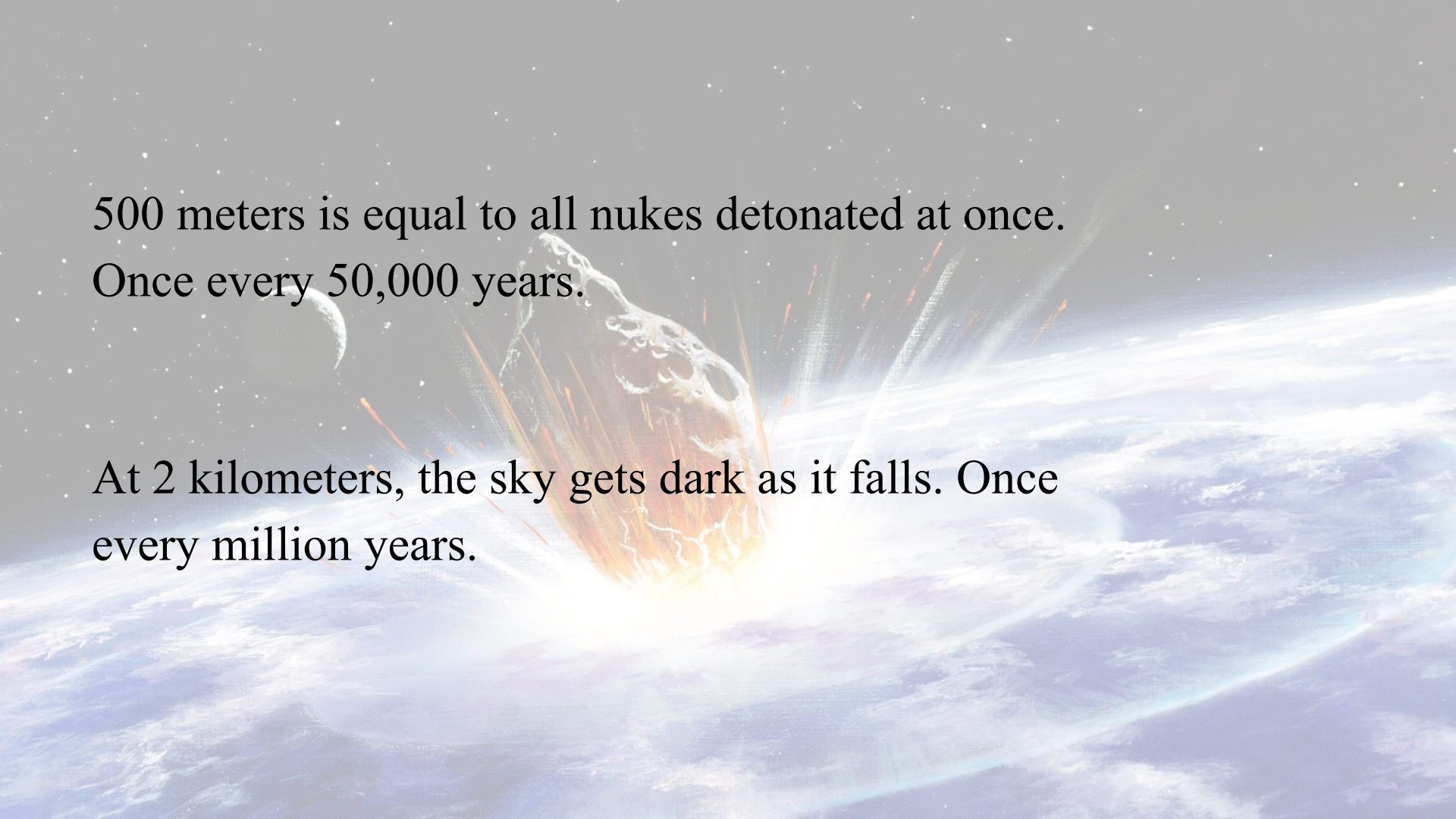
Asteroid Impact



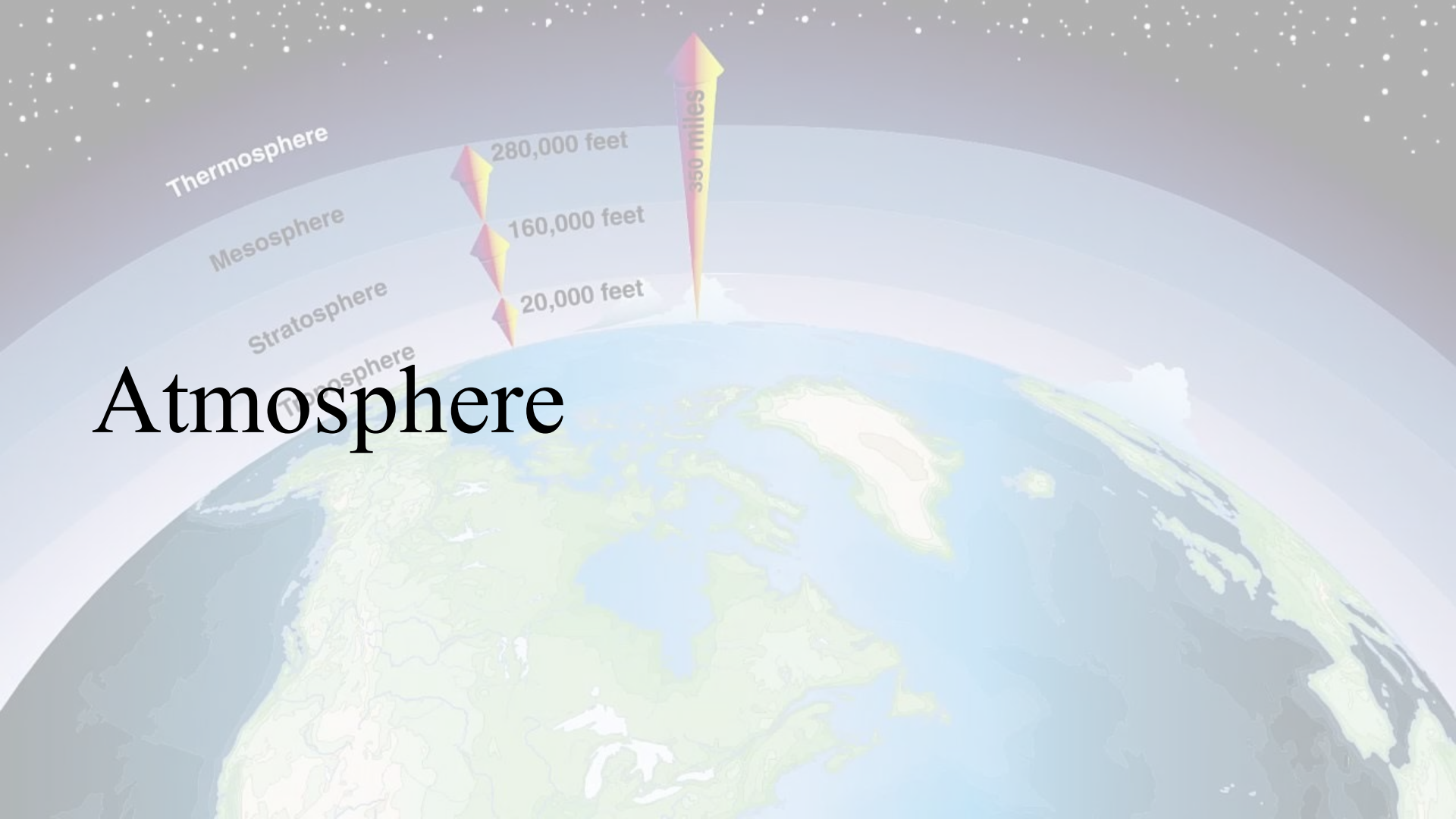
10-meter asteroids burn up in the air.

20-meter asteroids are like nuclear explosions on direct impact. On average, once every century.

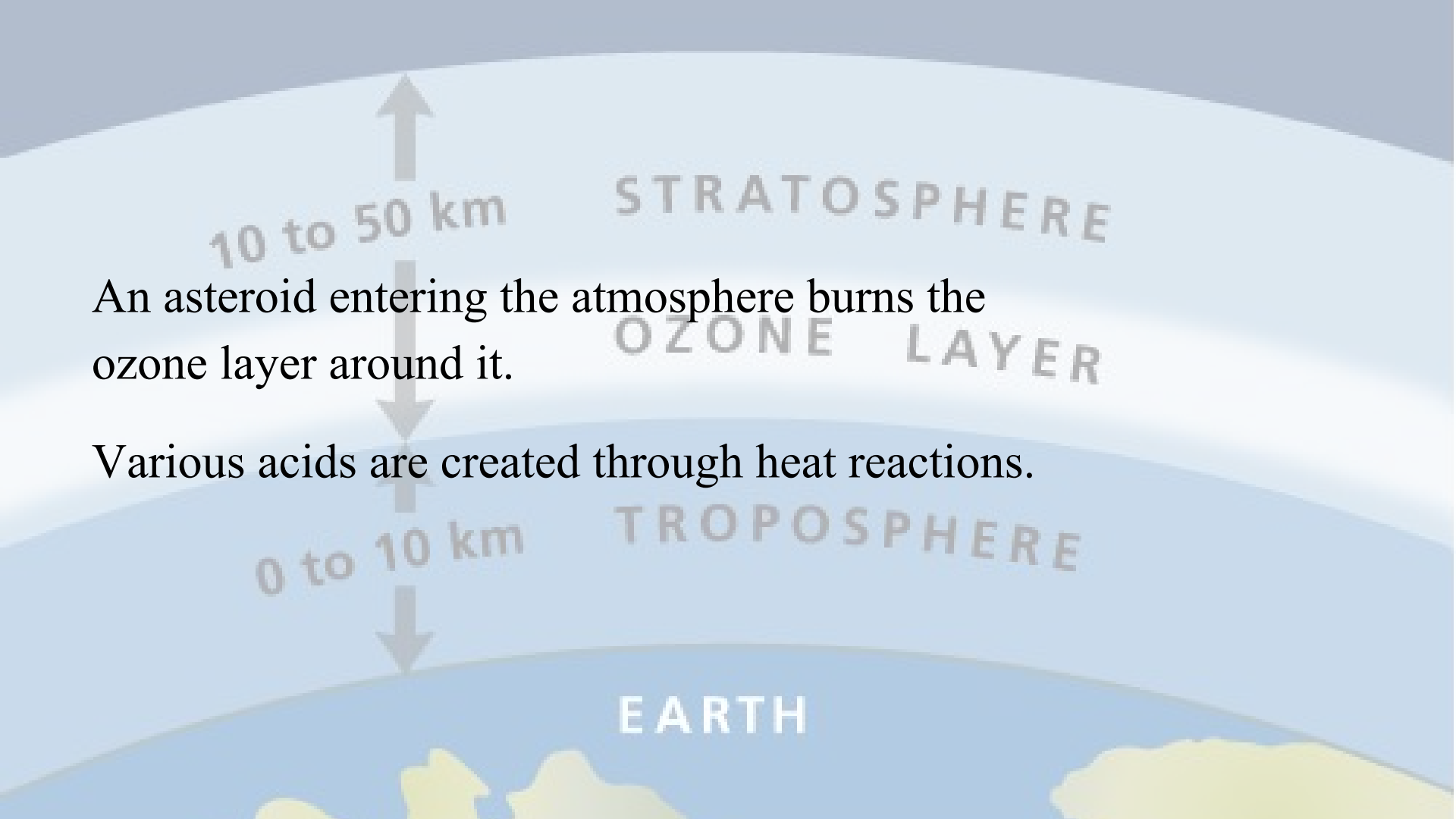


500 meters is equal to all nukes detonated at once. Once every 50,000 years.

At 2 kilometers, the sky gets dark as it falls. Once every million years.


Thermosphere
Mesosphere
Stratosphere
280,000 feet
160,000 feet
20,000 feet
350 miles

Atmosphere



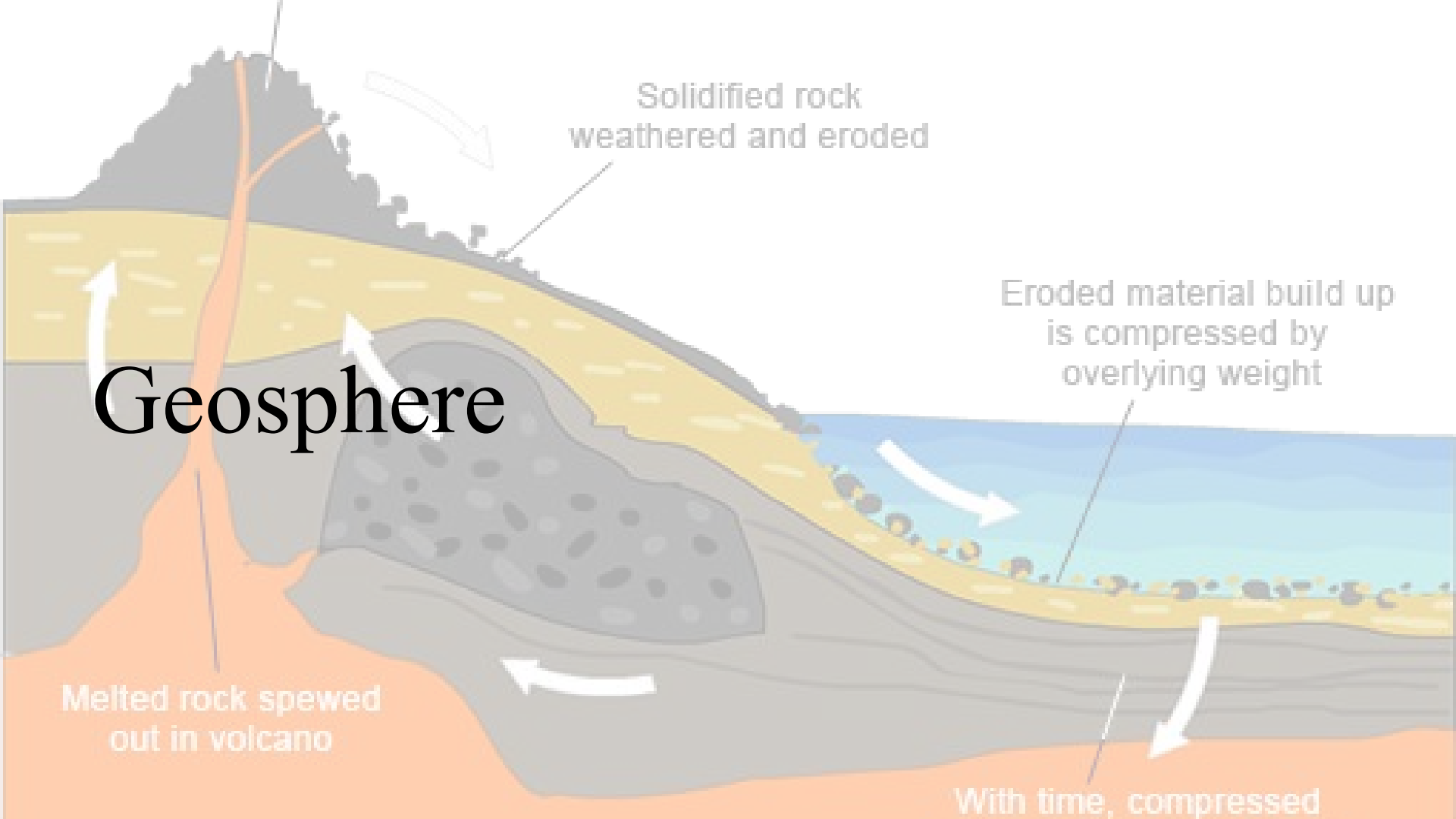
An asteroid entering the atmosphere burns the ozone layer around it.

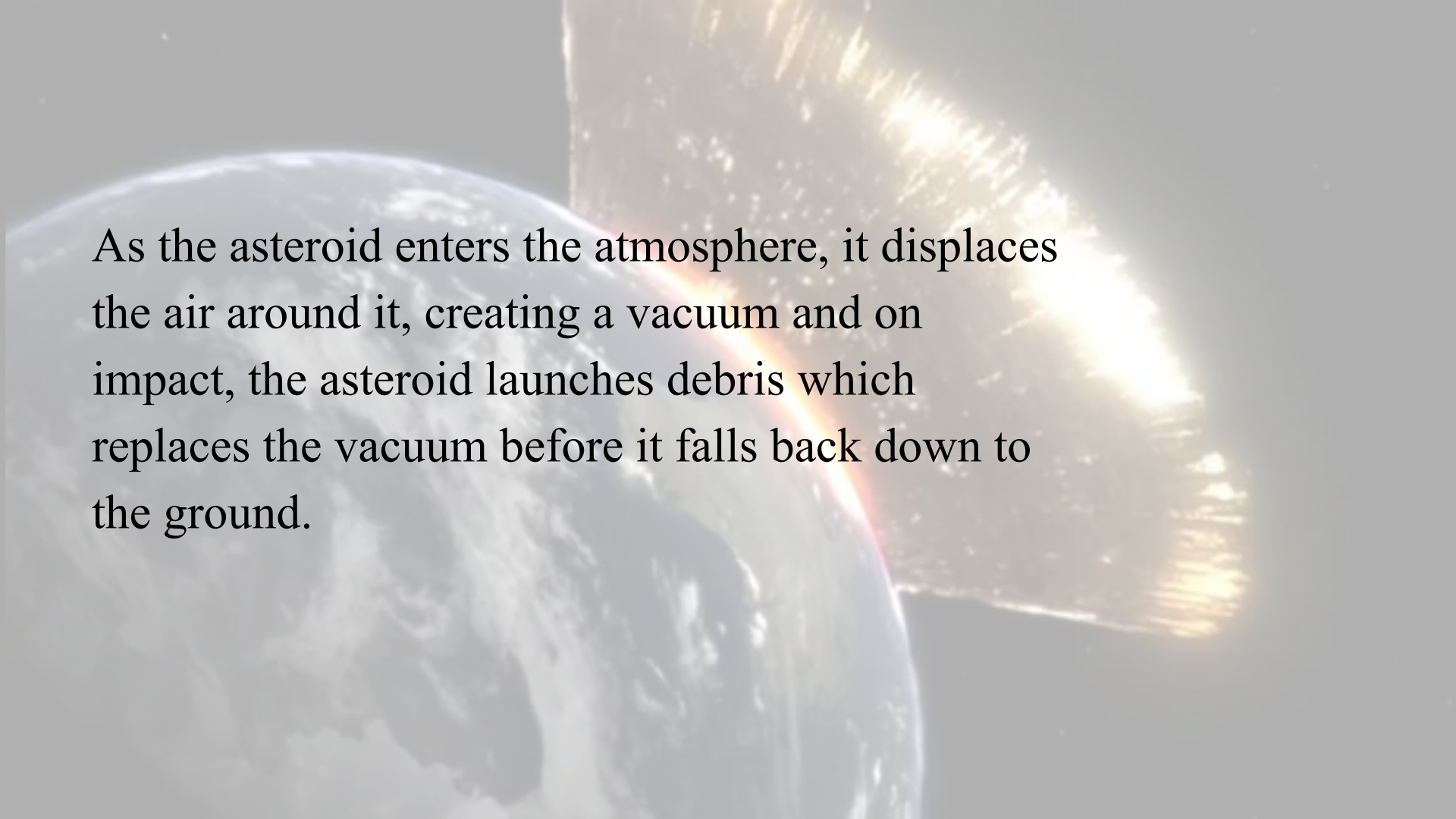
Various acids are created through heat reactions.

If the impact is powerful enough, the dust along with the soot from the fires can block out the sun and cause nuclear winter.

The temperature drops until the sky clears, afterward, the temperature will rise. (More greenhouse gases present after impact.)

Geosphere


Solidified rock
weathered and eroded
Eroded material build up
is compressed by
overlying weight
Melted rock spewed
out in volcano
With time, compressed



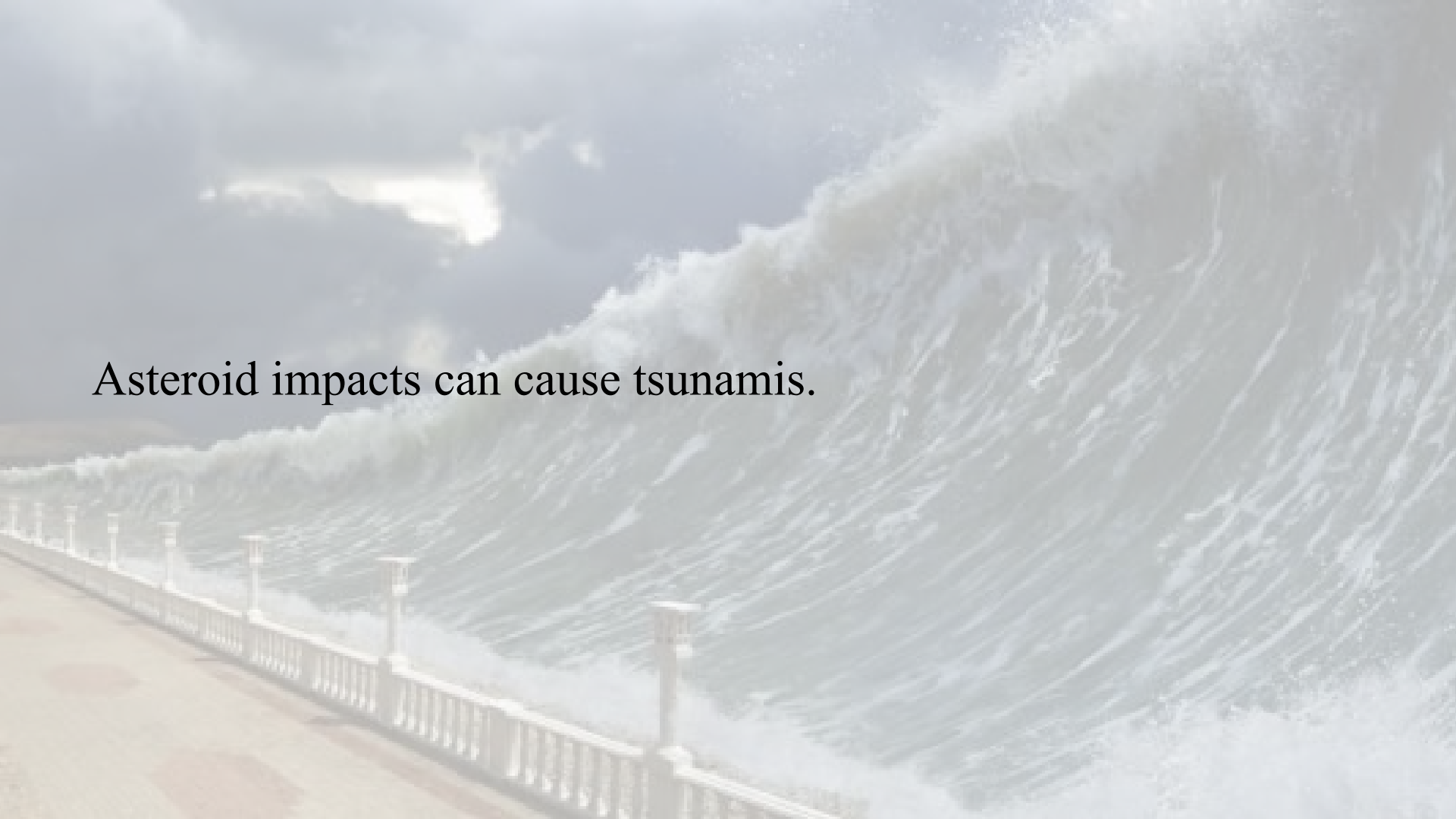
As the asteroid enters the atmosphere, it displaces the air around it, creating a vacuum and on impact, the asteroid launches debris which replaces the vacuum before it falls back down to the ground.

Asteroid impacts can cause earthquakes.

Asteroids will leave behind a crater regardless of where it lands.

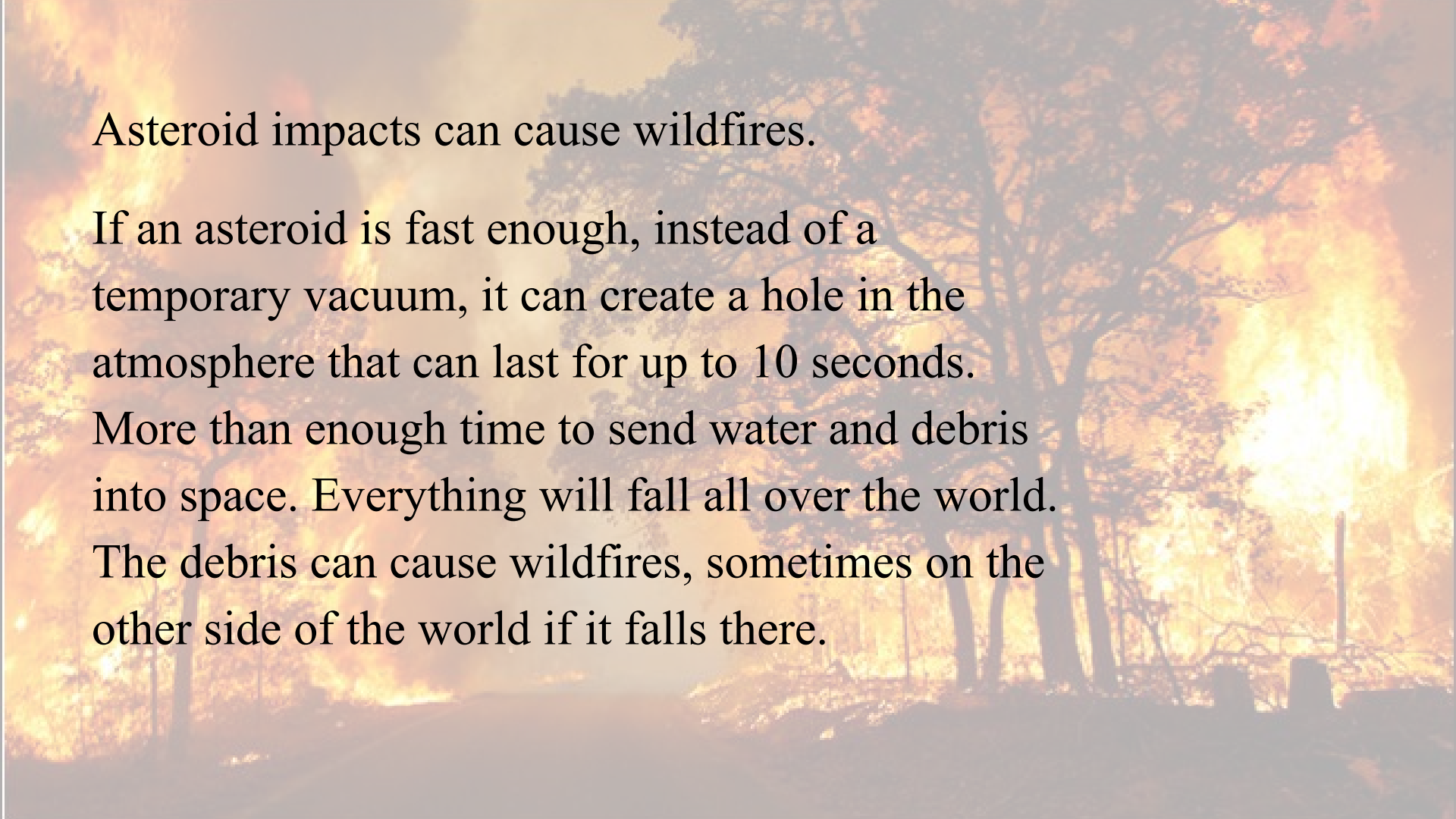
Hydrosphere

If the asteroid hits the ocean, water will be launched into the air and a steam explosion will occur, worsening the impact.



Asteroid impacts can cause tsunamis.

Biosphere



Asteroid impacts can cause wildfires.

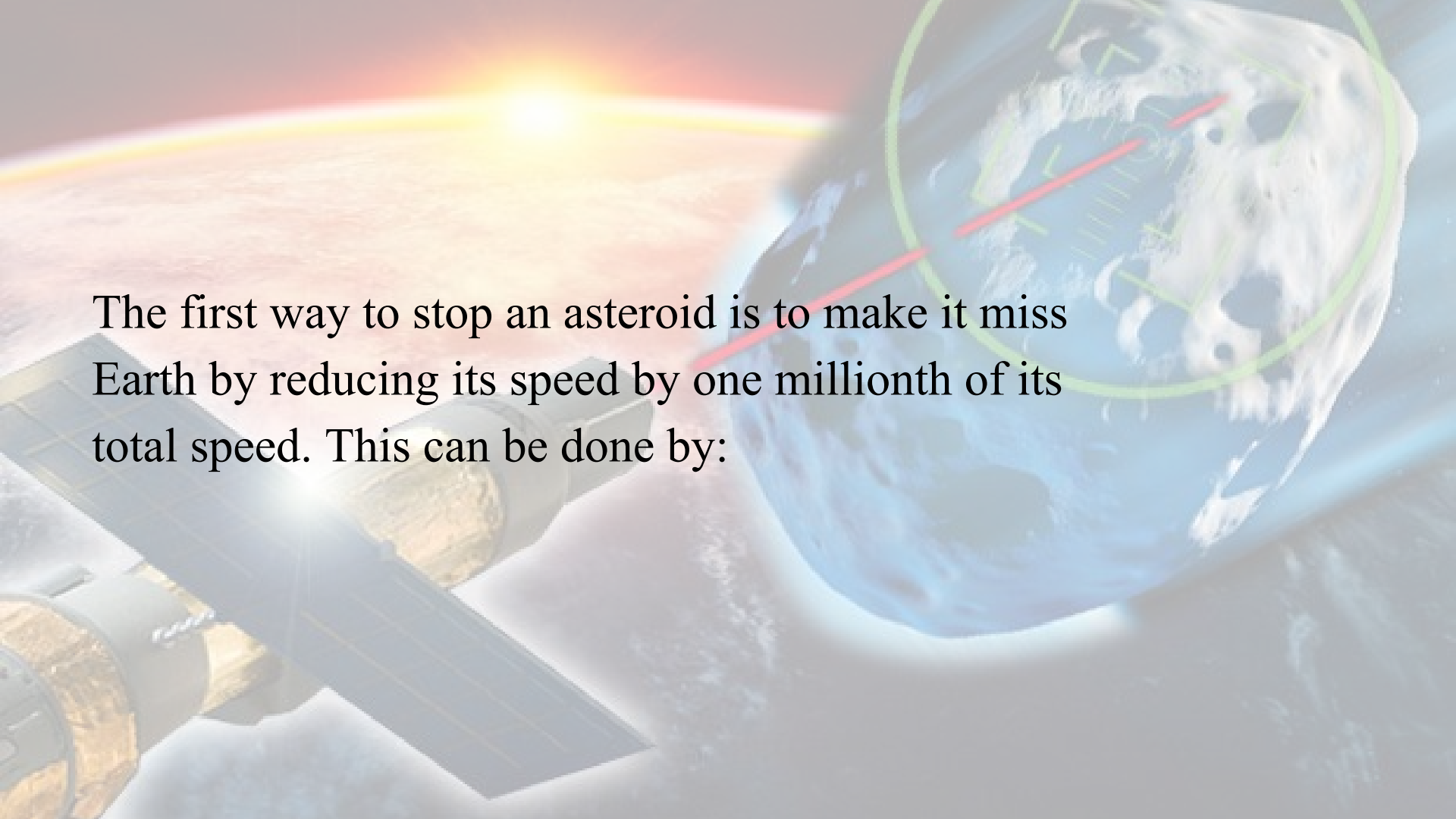
If an asteroid is fast enough, instead of a temporary vacuum, it can create a hole in the atmosphere that can last for up to 10 seconds. More than enough time to send water and debris into space. Everything will fall all over the world. The debris can cause wildfires, sometimes on the other side of the world if it falls there.

Without ozone, UV light enters and kills the plants. Small species are also killed.

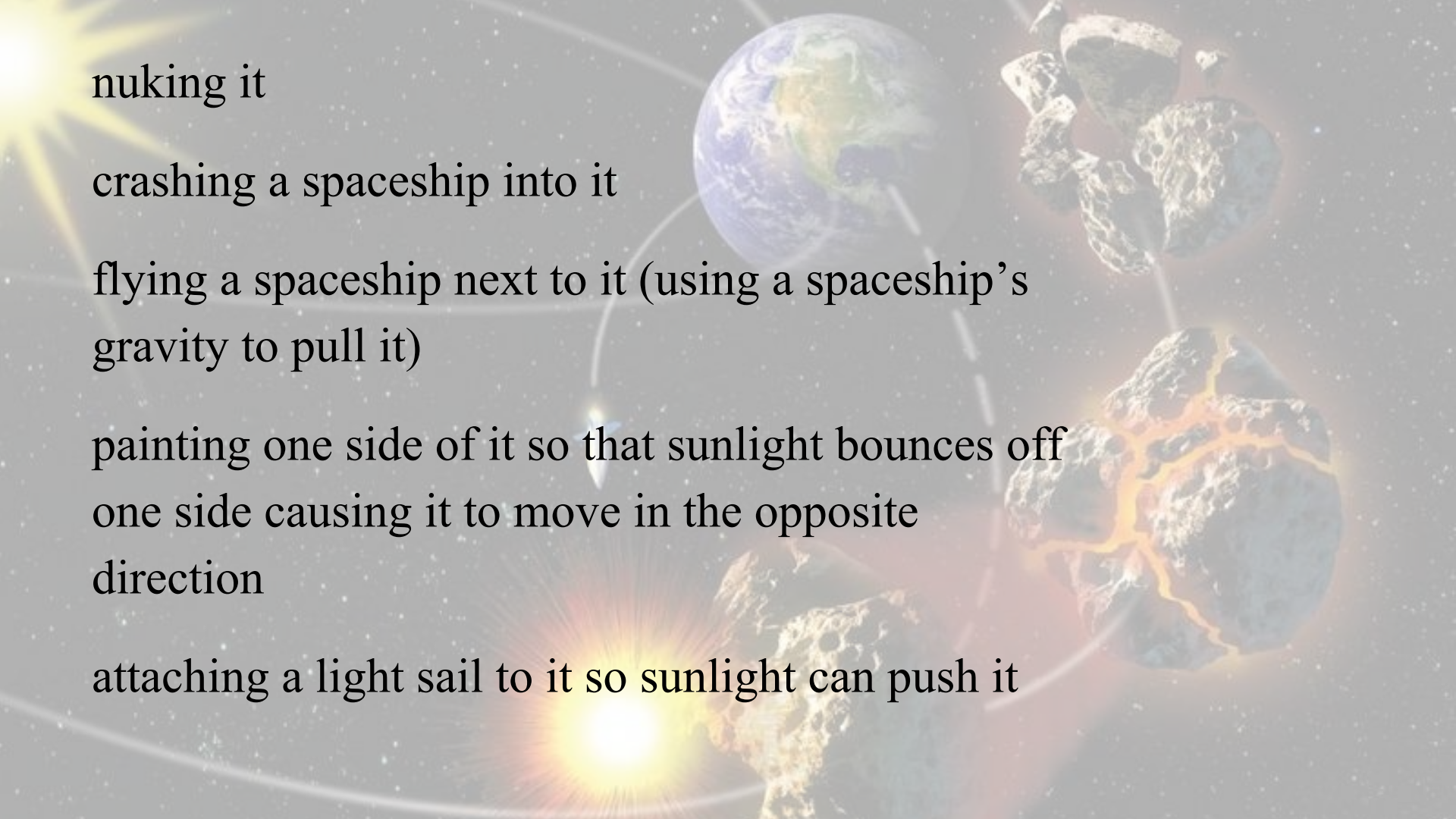
Acid rain also kills the plants. Upper ocean species are also killed as the carbon cycle gets disrupted.

If nuclear impact winter occurs, photosynthesis may completely stop, which will kill the food chain as the producers start to disappear.

Satellites and telescopes are being used to find asteroids heading for Earth. 20-meter asteroids are very hard to find; however, it will be easier as technology advances.



The first way to stop an asteroid is to make it miss Earth by reducing its speed by one millionth of its total speed. This can be done by:



nuking it

crashing a spaceship into it

flying a spaceship next to it (using a spaceship's gravity to pull it)

painting one side of it so that sunlight bounces off one side causing it to move in the opposite direction

attaching a light sail to it so sunlight can push it

However, if an asteroid heading for the earth isn't detected until the last month or two, then deflection is not an option. So the best option would be to destroy it by raming a nuke into the asteroid. If the asteroid isn’t destroyed, then a bunch of 20-meter asteroids is still better than one 500-meter asteroid.

Solar System Fluff, www.astronomynotes.com/solfluf/s5.htm.

"5 Ways to Stop a Killer Asteroid | Space Time | PBS Digital Studios." *YouTube*, YouTube, 18 Nov. 2015, www.youtube.com/watch?v=dEIjKjIgCA0.

"5 Ways to Stop a Killer Asteroid | Space Time | PBS Digital Studios." YouTube, YouTube, 18 Nov. 2015, www.youtube.com/watch?v=dEIjKjIgCA0.

Cooper-White, Macrina. "If You Think That Dino-Killing Asteroid Was Big, Wait Till You Hear About This Whopper." *The Huffington Post*, TheHuffingtonPost.com, 10 Apr. 2014, www.huffingtonpost.com/2014/04/10/ancient-asteroid-impact_n_5119788.htmhttp://www.huffingtonpost.com/2014/04/10/ancient-asteroid-impact_n_5119788.htmll.

Sumner, Thomas. "Here's How an Asteroid Impact Would Kill You." *Science News*, 10 May 2017, www.sciencenews.org/article/heres-how-asteroid-impact-would-kill-you.

"The Science Behind Shooting Stars." Scientific Notebook Company, 24 Aug. 2016, www.snco.com/blog/science-behind-shooting-stars/.

KLAviationVideo. "Structure of the Atmosphere." YouTube, YouTube, 19 June 2016, www.youtube.com/watch?v=87clrOOyvGI.

Ozone Layer | Climate Education Modules for K-12, climate.ncsu.edu/edu/k12/.ozonelayer.

"Scientists Consider Blocking Out the Sun to Stop Climate Change." *Inhabitat Green Design Innovation Architecture Green Building*, 8 Apr. 2011, inhabitat.com/scientists-make-a-plan-to-block-the-sun-to-stop-climate-change/.

Nag, Oishimaya Sen. "What And Where Is The Hydrosphere?" *WorldAtlas*, 6 Apr. 2016, www.worldatlas.com/articles/what-and-where-is-the-hydrosphere.html.

"11 Facts About Tsunamis." *DoSomething.org | Volunteer for Social Change*, www.dosomething.org/us/facts/11-facts-about-tsunamis.

"VIDEO:Děsivé! Realistická Simulace Toho, Jak by Dopadla Země Po Nárazu Asteroidu! | Prima Style." *Prima STYLE - Úvodní Stránka*, style.iprima.cz/kuriozity/videodesive-realisticka-simulace-toho-jak-dopadla-zeme-po-narazu-asteroidu.

"Wildfires." *Because Weather Is Awesome*, www.weatherwizkids.com/?page_id=94.

"Reboot the Biosphere." *Stuff to Blow Your Mind*, 13 Nov. 2014, www.stufftoblowyourmind.com/podcasts/reboot-the-biosphere.htm.

"Silver Nanoparticles in Clothing Could Harm Plant Life, Says New Study." *Ecouterre Dead Plants Comments*, www.ecouterre.com/silver-nanoparticles-in-clothing-could-harm-plant-life-says-new-study/dead-plants/.

Holloway, Henry. "'They Could DESTROY Earth' Asteroid Shield to Blast Doomsday Space Rocks REVEALED." *Dailystar.co.uk*, Daily Star, 12 Oct. 2016, www.dailystar.co.uk/news/latest-news/552720/Asgardia-Asteroid-Defence-Shield-Space-Nation-Paris-Doomsday-Meteor-Strike.

"Defending Earth from Asteroids with Nukes." *WordlessTech*, 25 June 2015, wordlesstech.com/defending-earth-from-asteroids-with-nukes/.

"FYI: Do Meteor Showers Ever Run Out of Meteors?" *Popular Science*, 18 Feb. 2013, www.popsci.com/science/article/2013-02/fyi-do-meteor-showers-ever-run-out-meteors.

Mailonline, Abigail Beall For. "Death Rays from Space: Bursts of Energy from Black Holes Could Wipe out Life on Earth WITHOUT Warning." *Daily Mail Online*, Associated Newspapers, 3 Aug. 2016, www.dailymail.co.uk/sciencetech/article-3721353/Death-SPACE-Bursts-energy-distant-black-holes-wipe-life-Earth-without-warning.html.