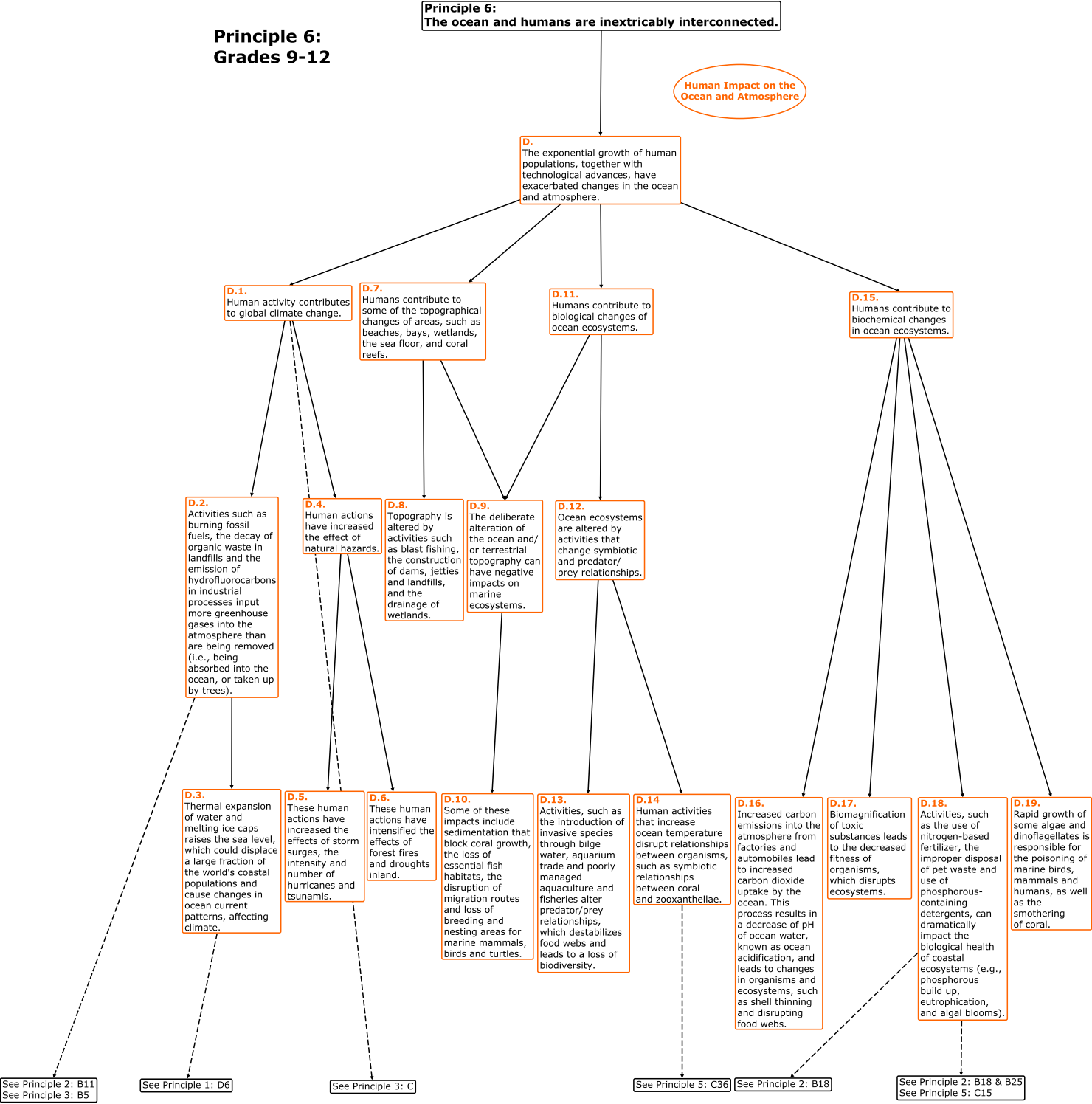
Principle 6:
Grades 9-12
Principle 6:
The ocean and humans are inextricably interconnected.
Human Impact on the Ocean and Atmosphere
D.
The exponential growth of human populations, together with technological advances, have exacerbated changes in the ocean and atmosphere.
D.1.
Human activity contributes to global climate change.
D.7.
Humans contribute to some of the topographical changes of areas, such as beaches, bays, wetlands, the sea floor, and coral reefs.
D.11.
Humans contribute to biological changes of ocean ecosystems.
D.15.
Humans contribute to biochemical changes in ocean ecosystems.
D.2.
Activities such as burning fossil fuels, the decay of organic waste in landfills and the emission of hydrofluorocarbons in industrial processes input more greenhouse gases into the atmosphere than are being removed (i.e., being absorbed into the ocean, or taken up by trees).
D.4.
Human actions have increased the effect of natural hazards.
D.8.
Topography is altered by activities such as blast fishing, the construction of dams, jetties and landfills, and the drainage of wetlands.
D.9.
The deliberate alteration of the ocean and/or terrestrial topography can have negative impacts on marine ecosystems.
D.12.
Ocean ecosystems are altered by activities that change symbiotic and predator/prey relationships.
D.3.
Thermal expansion of water and melting ice caps raises the sea level, which could displace a large fraction of the world's coastal populations and cause changes in ocean current patterns, affecting climate.
D.5.
These human actions have increased the effects of storm surges, the intensity and number of hurricanes and tsunamis.
D.6.
These human actions have intensified the effects of forest fires and droughts inland.
D.10.
Some of these impacts include sedimentation that block coral growth, the loss of essential fish habitats, the disruption of migration routes and loss of breeding and nesting areas for marine mammals, birds and turtles.
D.13.
Activities, such as the introduction of invasive species through bilge water, aquarium trade and poorly managed aquaculture and fisheries alter predator/prey relationships, which destabilizes food webs and leads to a loss of biodiversity.
D.14
Human activities that increase ocean temperature disrupt relationships between organisms, such as symbiotic relationships between coral and zooxanthellae.
D.16.
Increased carbon emissions into the atmosphere from factories and automobiles lead to increased carbon dioxide uptake by the ocean. This process results in a decrease of pH of ocean water, known as ocean acidification, and leads to changes in organisms and ecosystems, such as shell thinning and disrupting food webs.
D.17.
Biomagnification of toxic substances leads to the decreased fitness of organisms, which disrupts ecosystems.
D.18.
Activities, such as the use of nitrogen-based fertilizer, the improper disposal of pet waste and use of phosphorous-containing detergents, can dramatically impact the biological health of coastal ecosystems (e.g., phosphorous build up, eutrophication, and algal blooms).
D.19.
Rapid growth of some algae and dinoflagellates is responsible for the poisoning of marine birds, mammals and humans, as well as the smothering of coral.
See Principle 2: B11
See Principle 3: B5
See Principle 1: D6
See Principle 3: C
See Principle 5: C36
See Principle 2: B18
See Principle 2: B18 & B25
See Principle 5: C15