Prelim Bits 06-05-2019

Pacific Decadal Oscillation (PDO)

- The Pacific Decadal Oscillation (PDO) is a robust, recurring pattern of ocean-atmosphere climate variability centred over the mid-latitude Pacific basin.
- The PDO is detected as warm or cool surface waters in the Pacific Ocean, north of 20°N.
- During a "warm", or "positive", phase, the west Pacific becomes cooler and part of the eastern ocean warms; during a "cool" or "negative" phase, the opposite pattern occurs.
- Over the past century, the amplitude of this climate pattern has varied irregularly at inter annual-to-inter decadal time scales.
- Northeast India, one of the wettest places on the Earth has been experiencing rapid drying due to the Pacific Decadal Oscillation.
- Just like El Nino/La Nina in the tropical Pacific, PDO has a signature for a longer time (on the decadal scale) in the subtropical Pacific Ocean temperatures and its interaction with the atmosphere, which in turn affects the northeast Indian summer monsoon.
- This climate pattern also affects the coastal sea and continental surface air temperatures from Alaska to California.

International Religious Freedom Report

- International Religious Freedom report is an annual report released by the US Commission on International Religious Freedom (USCIRF).
- USCIRF is a bipartisan, independent federal government commission, created by the International Religious Freedom Act of 1998.
- The report describes threats to religious freedom around the world and recommends to the State Department countries for designation as “countries of particular concern” (CPCs) for engaging in or tolerating “systematic, ongoing, egregious violations.”
- USCIRF also recommends to the State Department that non-state actors cited for similarly severe violations be designated as “entities of particular concern” (EPCs).
- According to the report India is facing declining religious freedom, apart

from increased securitization and politicization of religion.
- India continues to remain a Tier II country of the list, Tier II countries are those in which violations engaged in or tolerated by the government are serious and characterized by at least one of the elements of systematic, ongoing, and egregious (horrible)'.

3D Printed Skin

- Indian Institute of Technology (IIT) Delhi have successfully 3D bio printed human skin models.
- It has certain anatomically relevant structural, mechanical and biochemical features similar to native human skin.
- The bio printed skin model will have wide applications in testing cosmetics.
- It can also reduce and probably even replace testing on animals.
- It can also be used for testing dermatology drugs on human skin and at a future date even help in testing drugs for personalized medicine.

Bio-Printing

- Bioprinting originated in early 2000s, when it was discovered that living cells could be sprayed through the nozzles of inkjet printers without being damaged.
- Today, using multiple print heads to squirt out different cell types, along with polymers that help the structure keep its shape, it is possible to deposit layer upon layer of cells that will bind together and grow into living, functional tissue.
- Researchers are using bioprinting technology to produce kidney, liver tissues, skin, bones, cartilage and even human heart, as well as the networks of blood vessels needed to keep body parts alive.

Aditya- L1 Mission

- The Indian Space Research Organization is planning to launch Aditya- L1 mission to study the sun early in 2020.
- Aditya- L1 mission is India's first solar mission which will study the sun's outer most layers, the corona and the chromospheres and collect data about coronal mass ejection, which will also yield information for space weather prediction.
- The data from Aditya mission will be immensely helpful in discriminating between different models for the origin of solar storms and also for constraining how the storms evolve and what path they take through the

interplanetary space from the Sun to the Earth.
- Aditya- L1 satellite will be placed in the halo orbit around the Lagrangian point 1 (L1) of the sun-earth system.

Lagrangian points

- Lagrangian points are the locations in space where the combined gravitational pull of two large masses roughly balances each other.
- Any small mass placed at that location will remain at constant distances relative to the large masses.
- There are five such points in the Sun-Earth system and they are denoted as L1, L2, L3, L4 and L5.
- A halo orbit is a periodic three-dimensional orbit near the L1, L2 or L3.

Source: Times of India, the Hindu