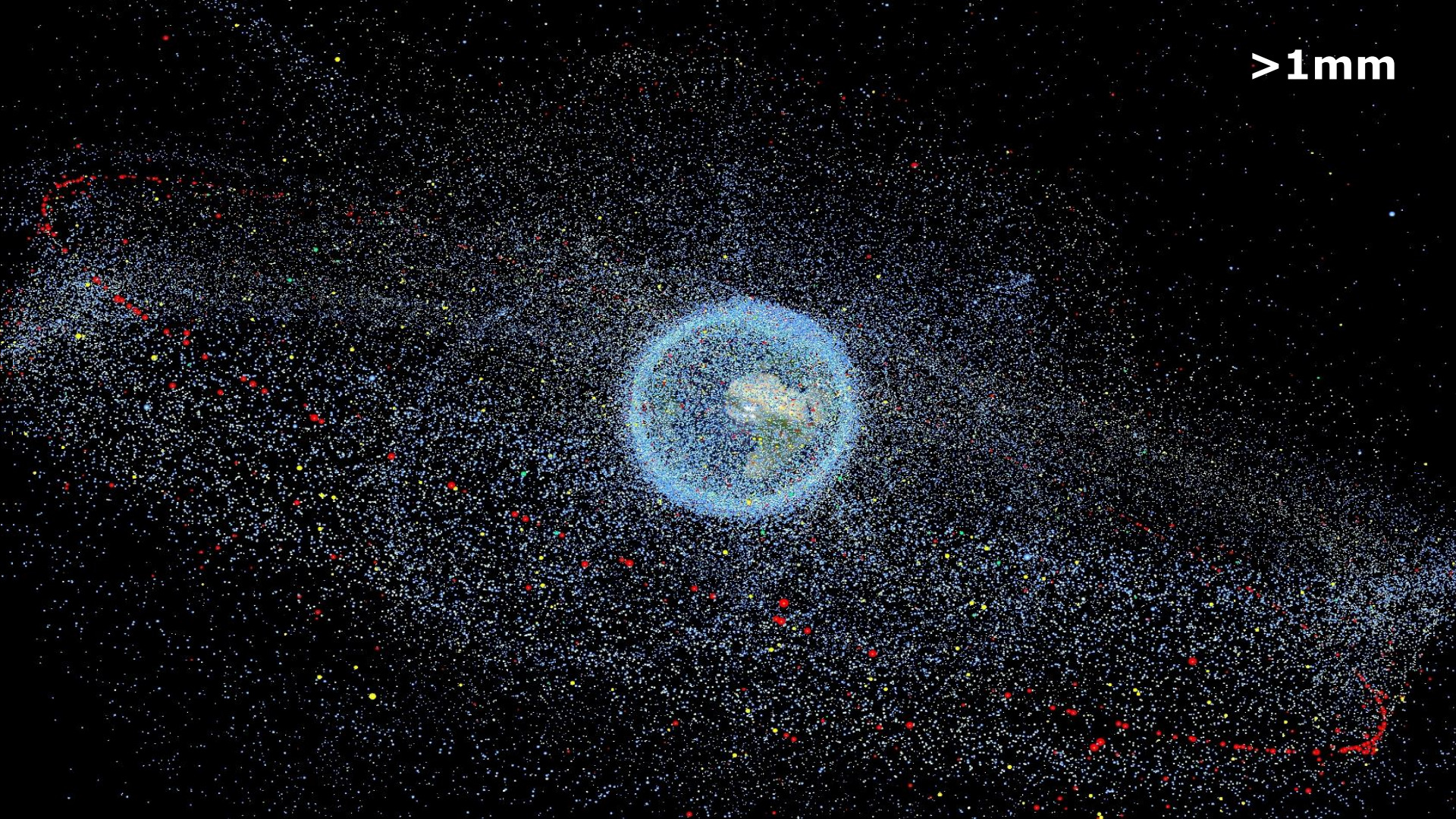


State of the Space Environment

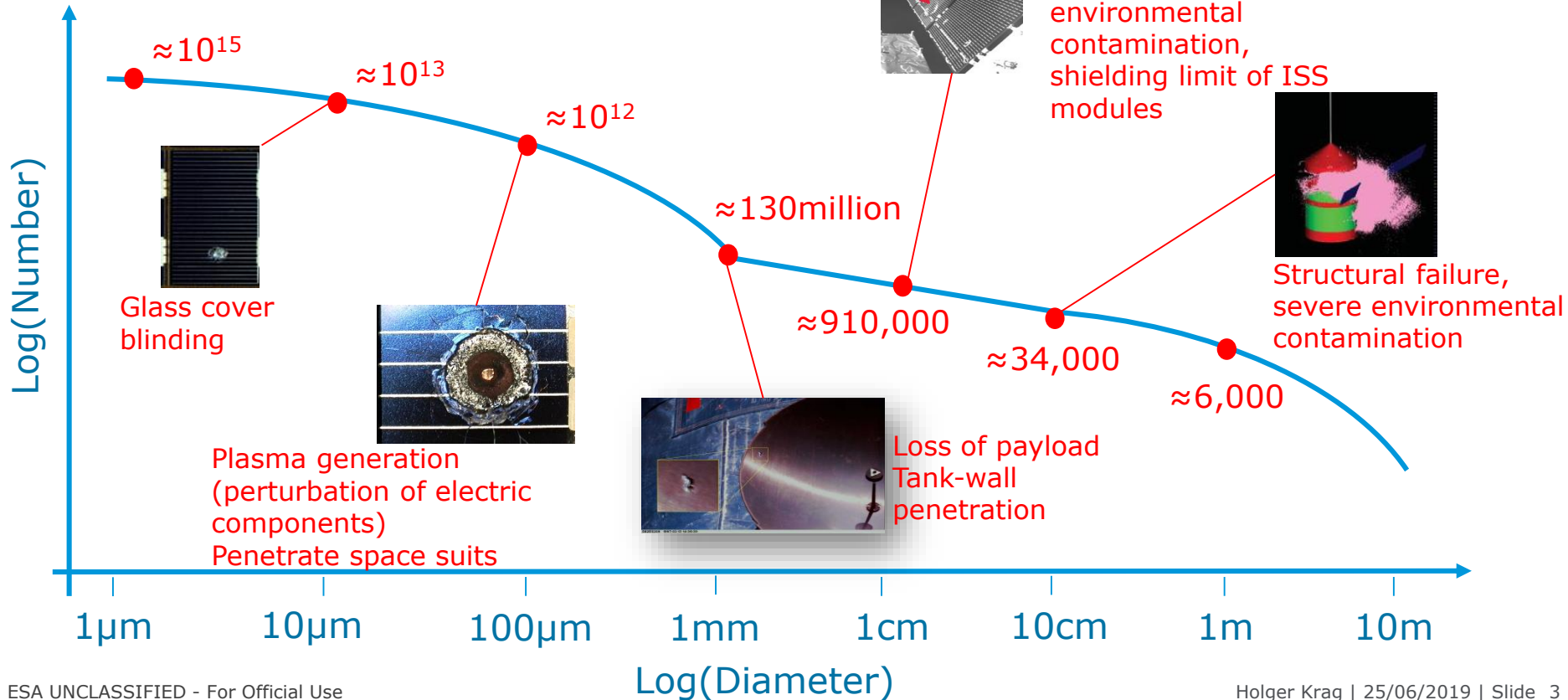
Holger Krag, Head of ESA's Space Debris Office

25/06/2019

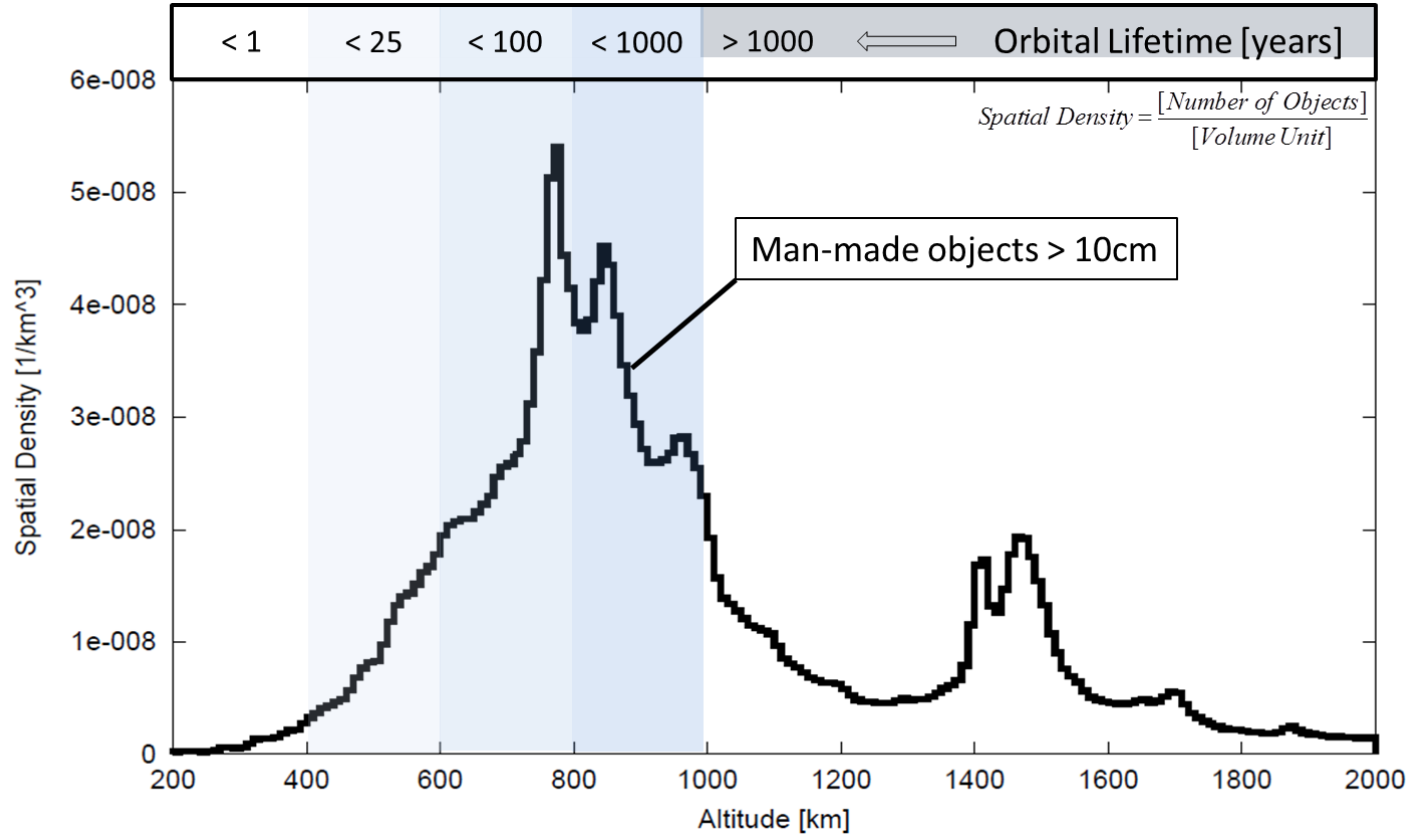
>1mm



Numbers & Effects



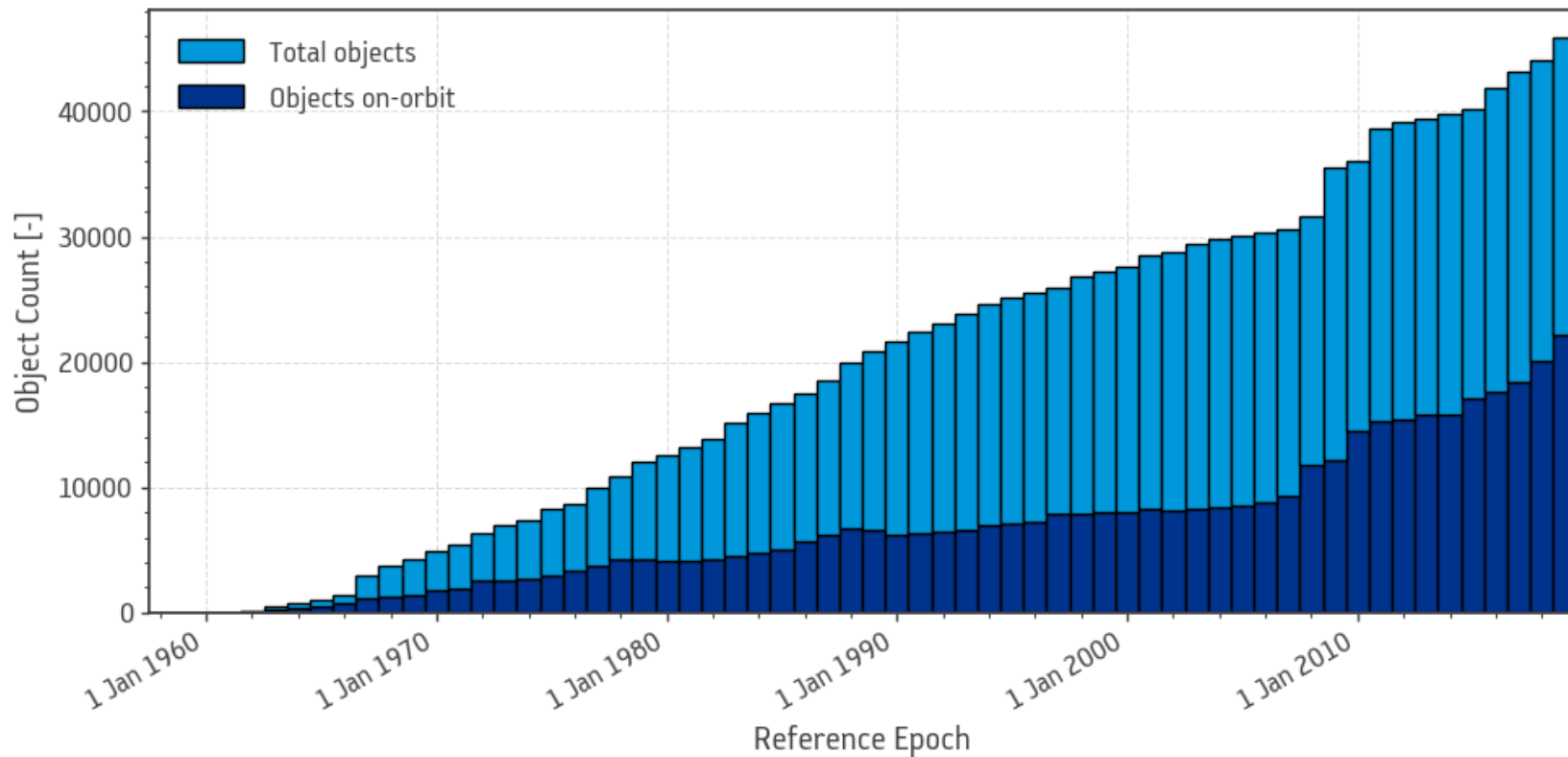
Spatial Density

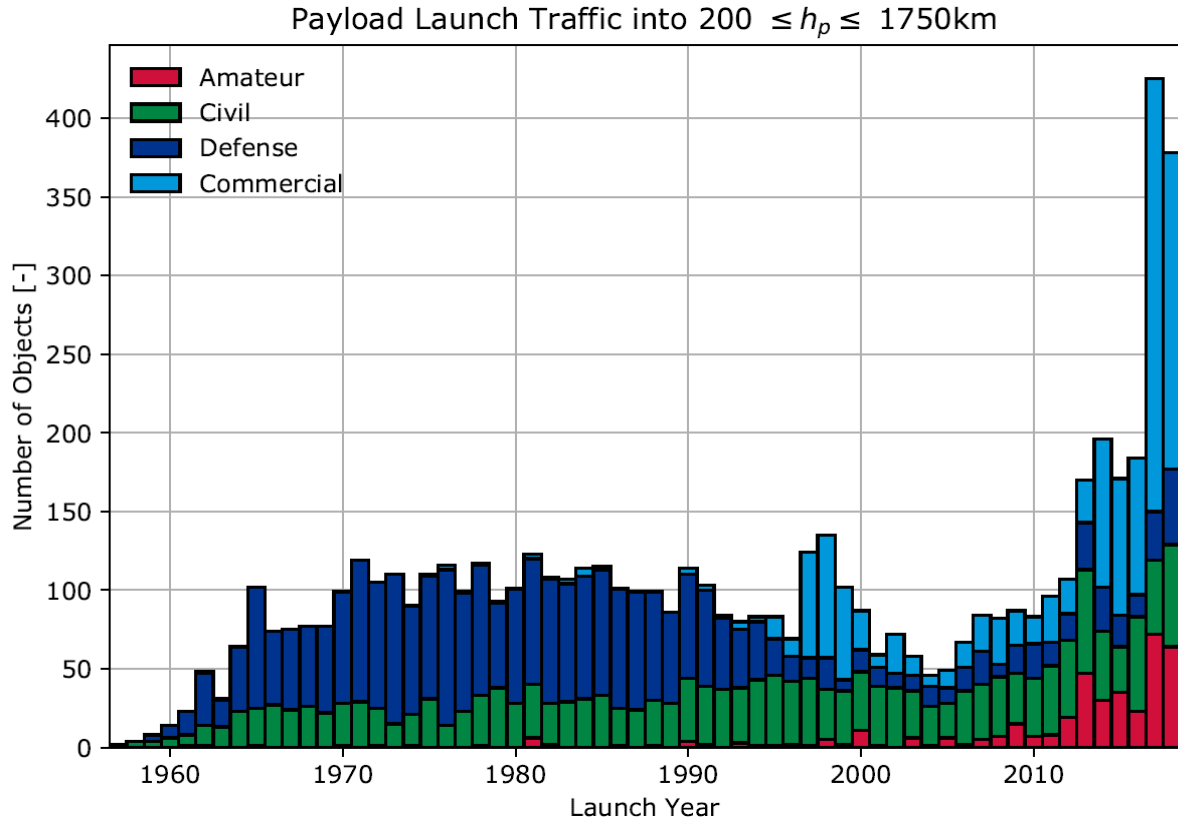


Impact on Sentinel-1A Solar Array (Aug. 23rd 2016)



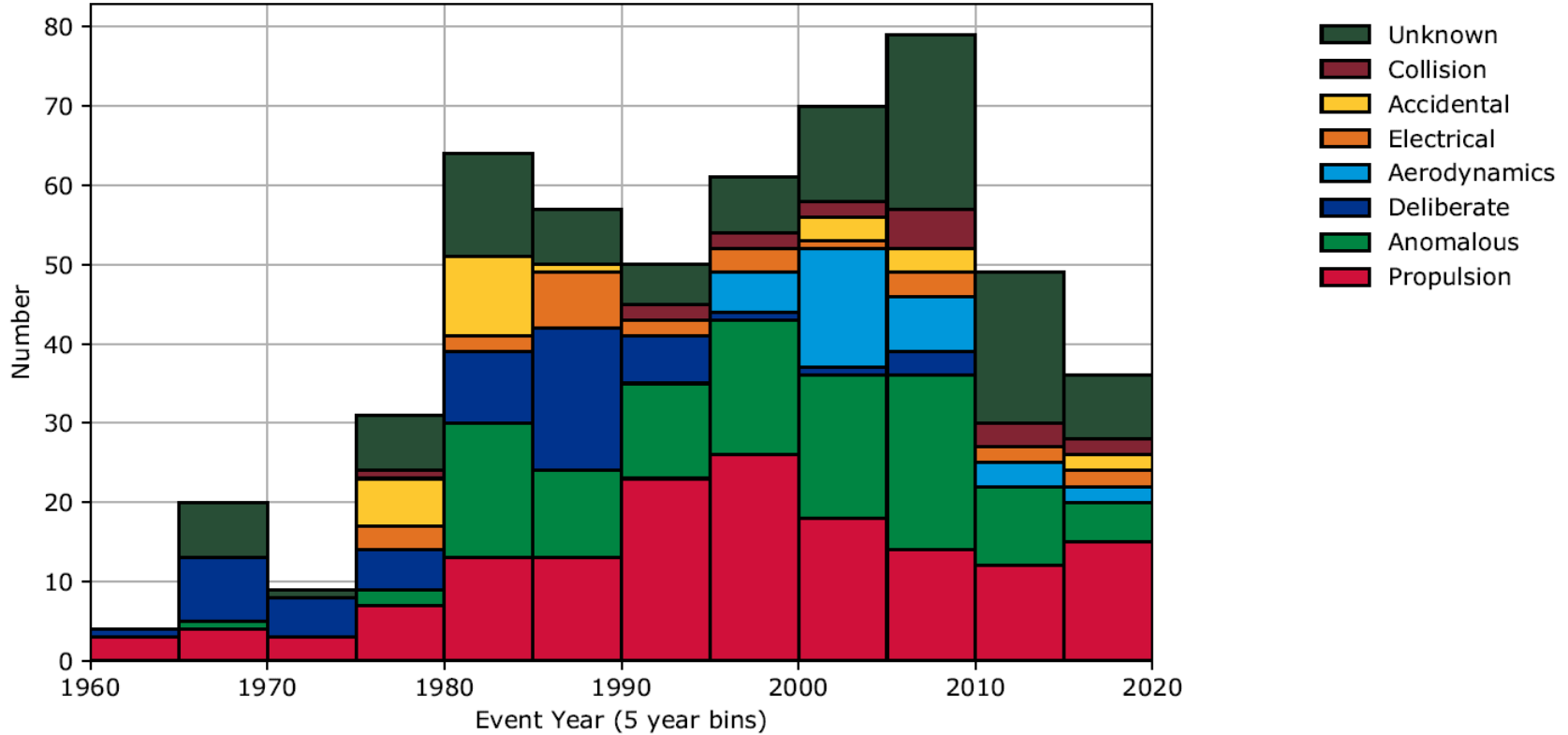
Catalogued Objects





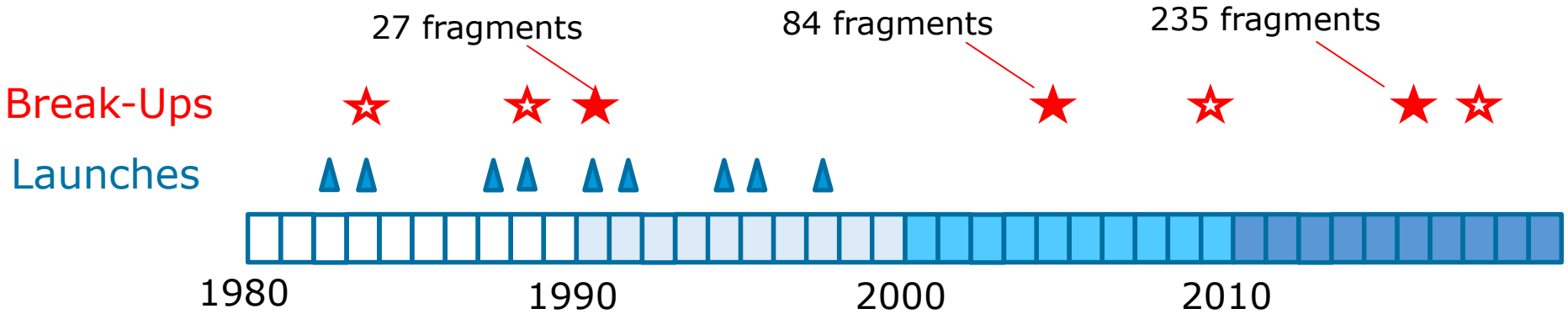
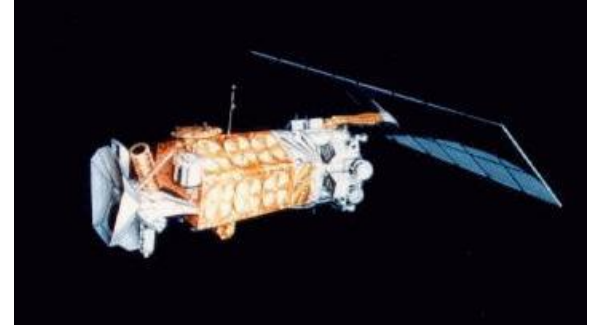
Fragmentation Events

Number Fragmentation Events



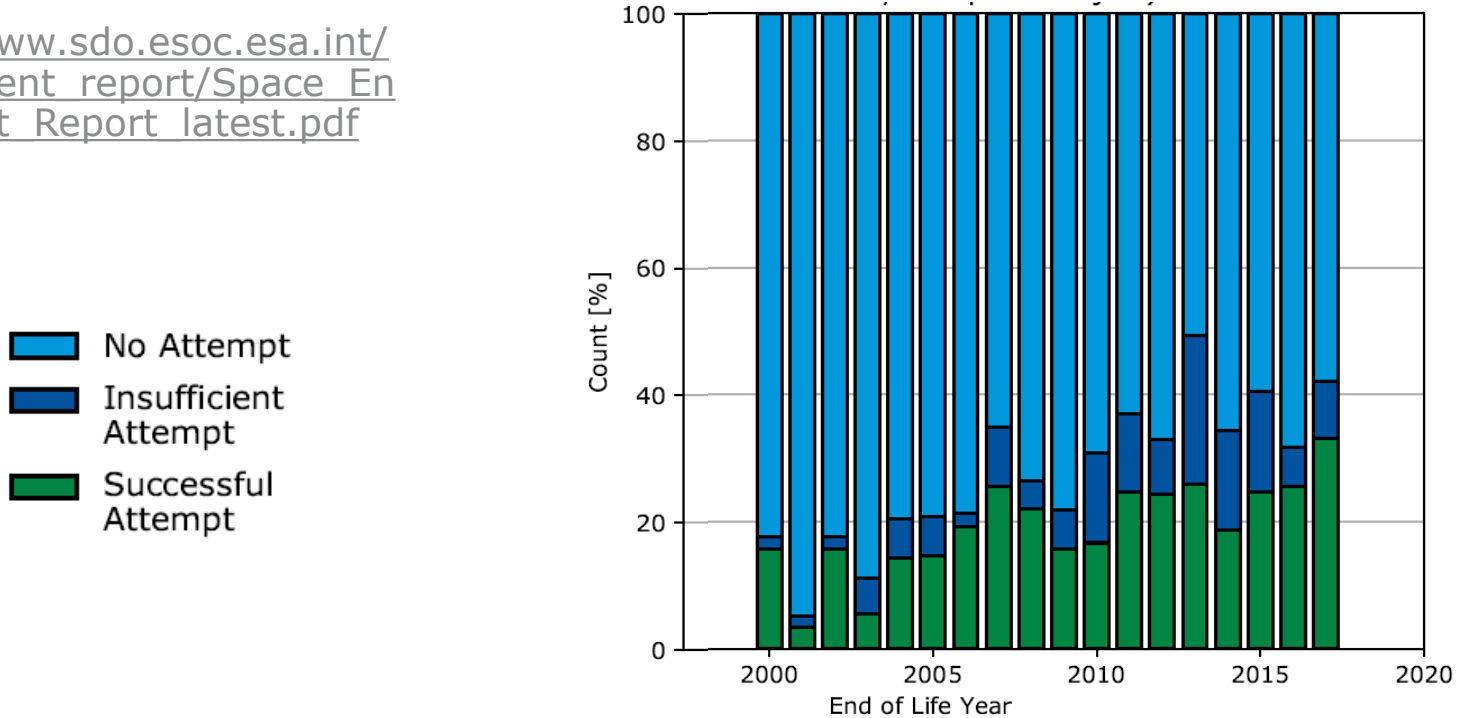
Late Effect of Design Flaws

- DMSP (Defence Meteorological Satellite Programme)
- Series 5D-2 (9 spacecraft, 7 broken-up)
- Battery fault



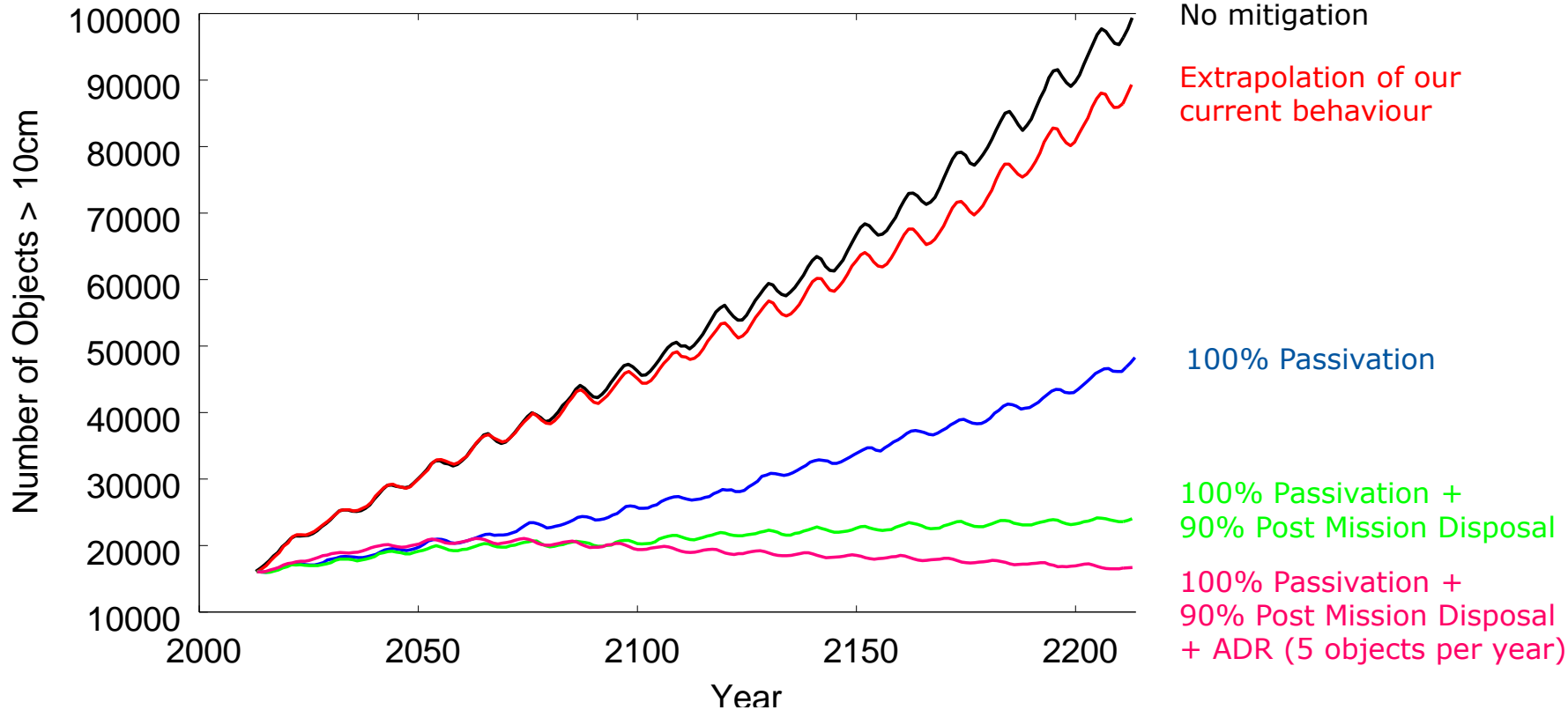
- https://www.sdo.esoc.esa.int/environment_report/Space_Environment_Report_latest.pdf

Statistics on the success-rate of Post Mission Disposal Manoeuvres



Effectivity of Measures

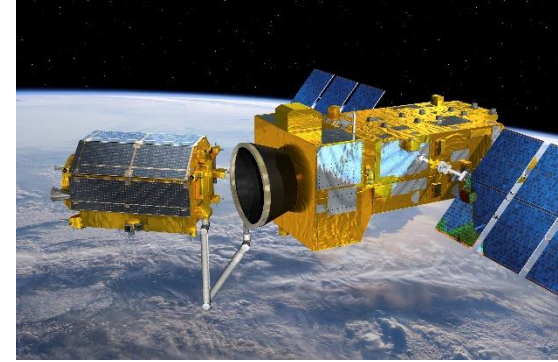
Effectiveness of Mitigation Measures





Laser Tracking of Space Debris

Active Removal/In-orbit Servicing as Industrial Service



Automation of Collision Avoidance

Technology for Debris Mitigation

