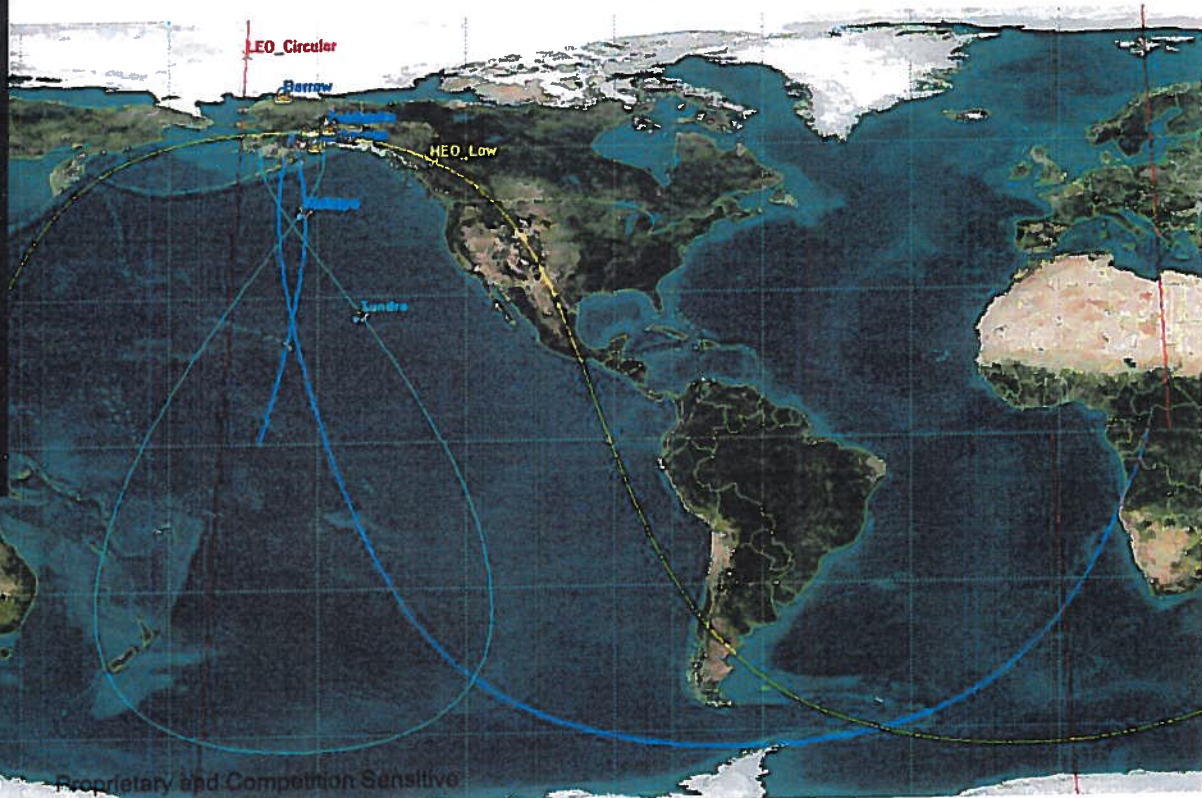
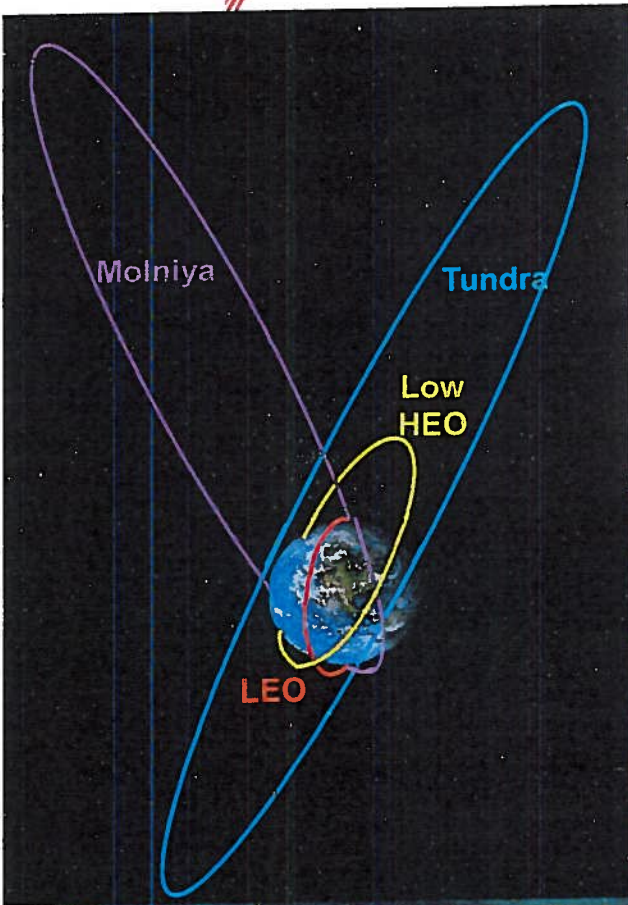


Orbital Comparisons



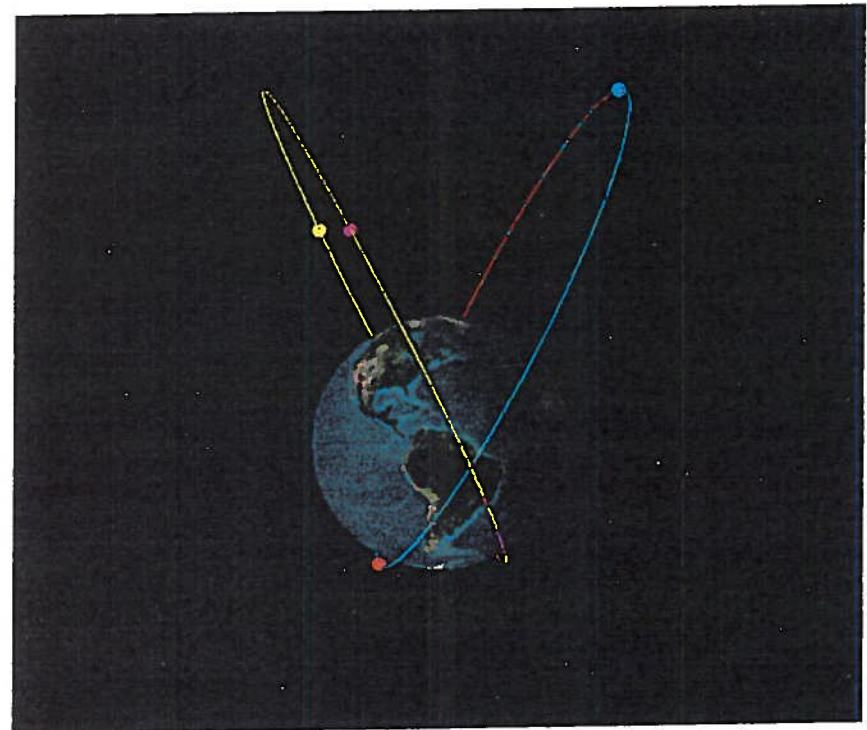
Orbit Description	Apogee (km)	Perigee (km)	Period (hour)	Single Pass Coverage	24-Hour Coverage
LEO_Circular	500	500	1.56	7 min	~ 4%
HEO_Low	12,000	400	3.9	2.1 hours	~ 54%
Molniya	47,000	500	9.5 hours	~ 80%	
Tundra	40,000	24,500	24	16.7 hours	~ 70%



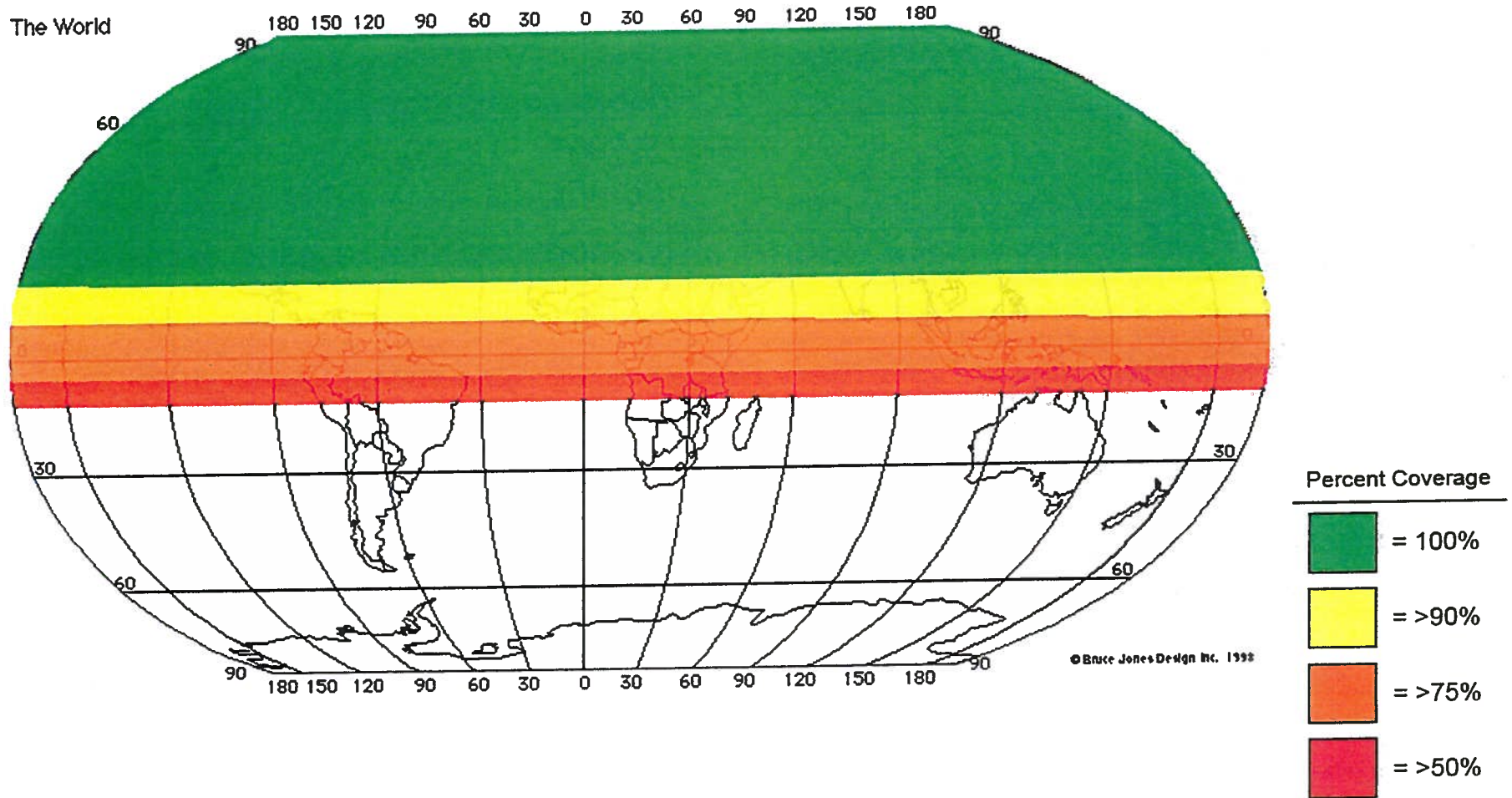
Ground Track

4 satellites:

- Prograde orbits, 63.4° inclination
- 13000 km x 400 km
- Two orbital planes
- Two Satellites per plane
- Provides 1 fault failure tolerance and still retain 24/7 coverage
- 2 Satellites always visible to ground in Alaska and majority of Canada
- 24/7 coverage available in latitudes as low as Honolulu, Hi
- Uniform coverage in high latitudes

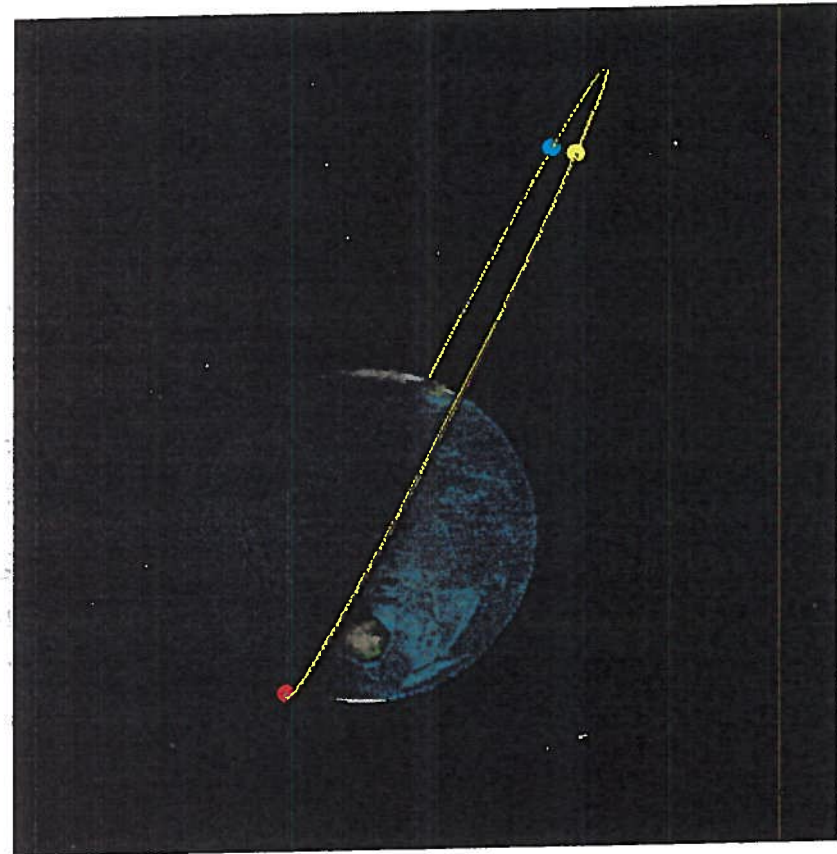


HEO-Low Four Satellite Coverage Map

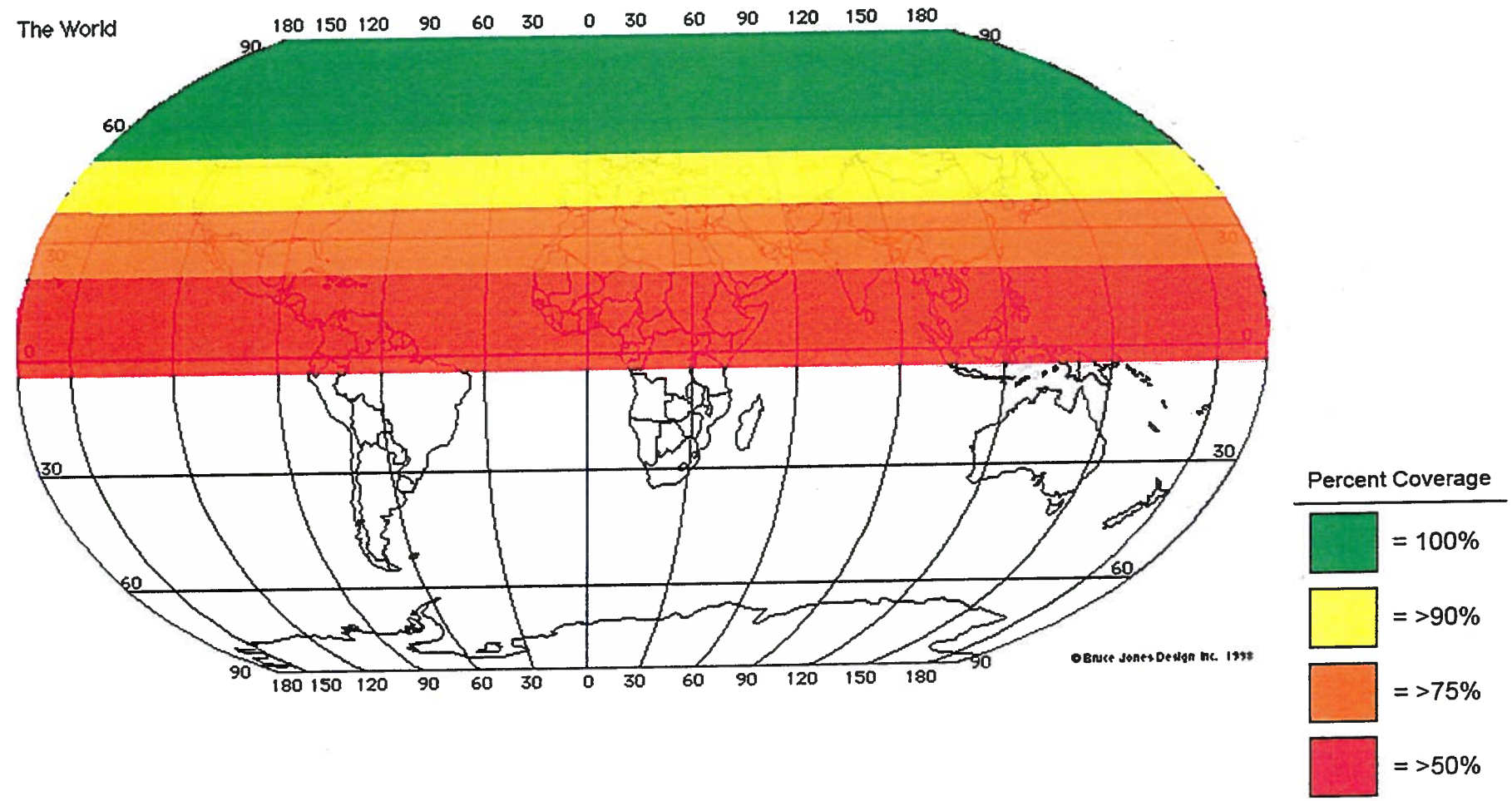


Three Satellites:

- One orbital plane
- Prograde, 63.4° inclination
- 13000 km x 400 km
- 24/7 Coverage in northern latitudes down to Vancouver, BC
- 75% Coverage in Honolulu, Hi
- 92% Coverage remaining upon single satellite failure, recoverable to 100% with attitude changes

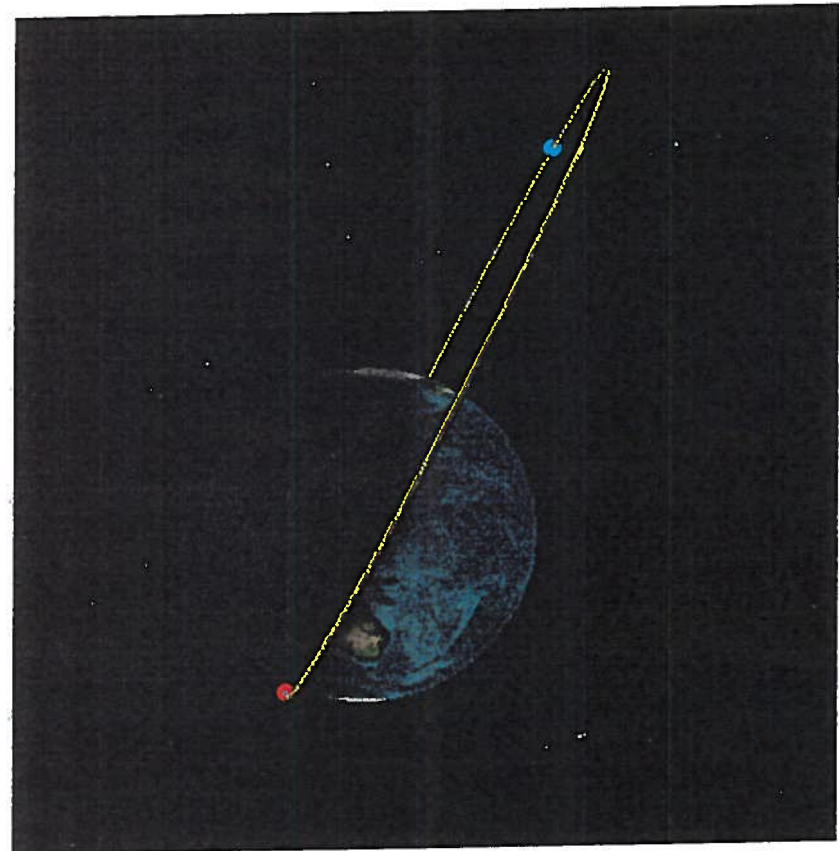


HEO-Low Three Satellite Coverage Map

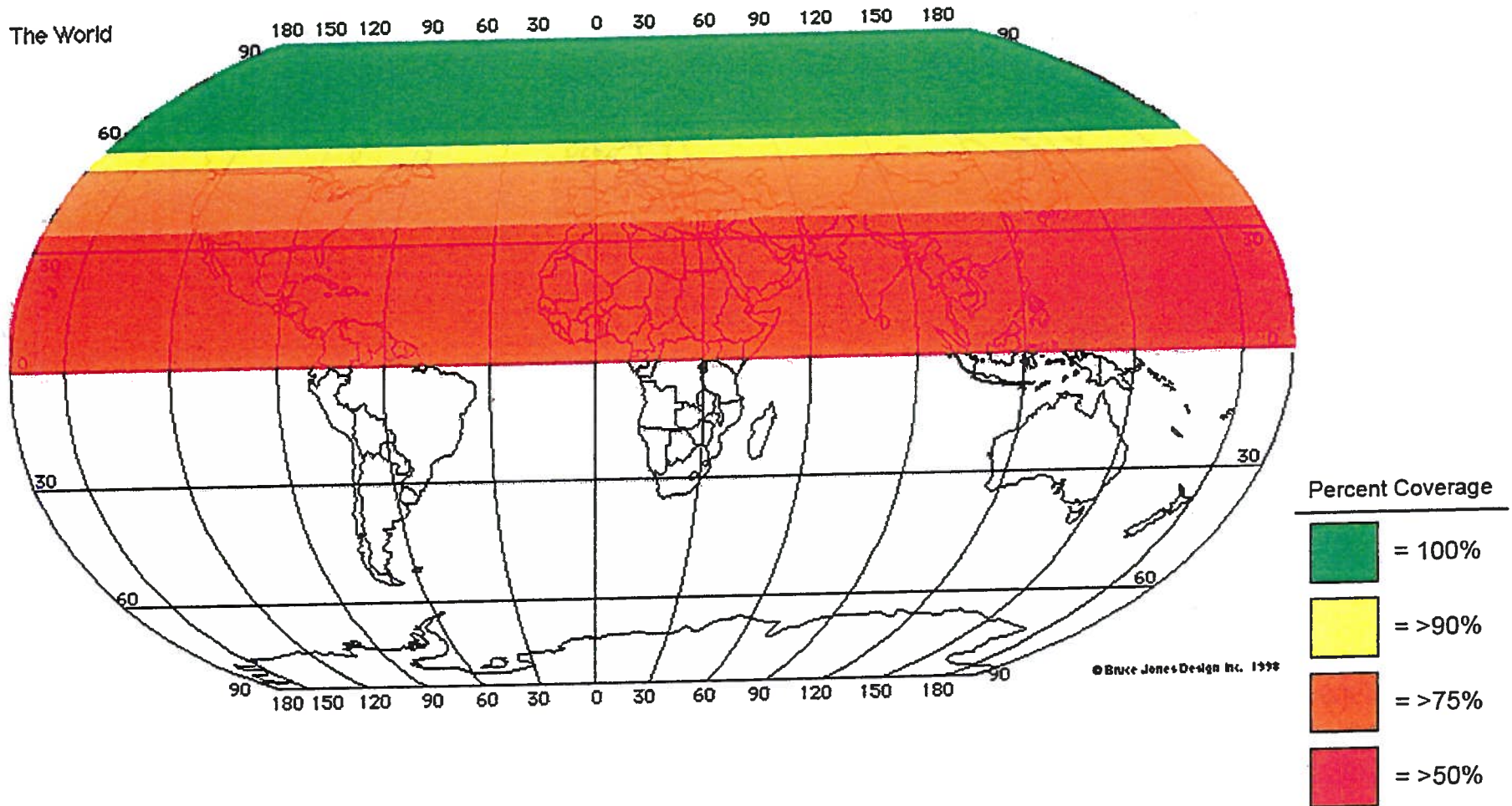


2 satellites:

- Prograde orbit, 63.4° inclination
- 13000 km x 400 km
- One orbital plane
- Two Satellites per plane
- Lowest Cost Option and still maintain 100% coverage over Alaska

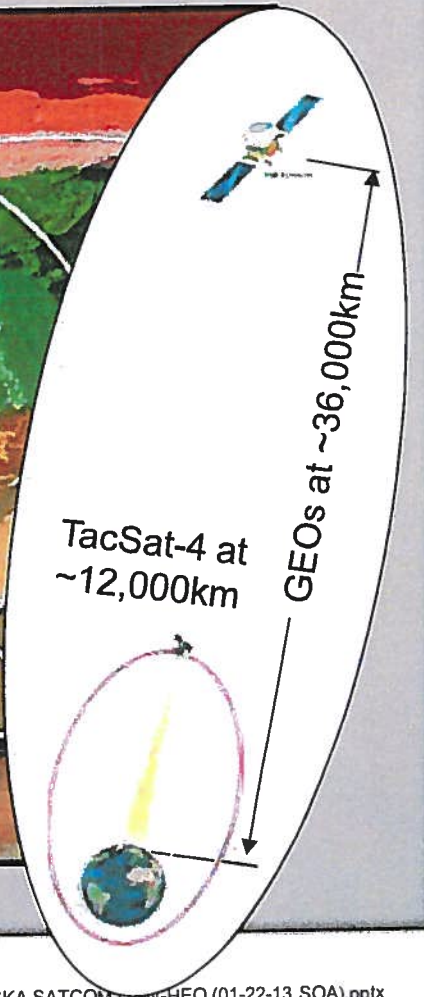
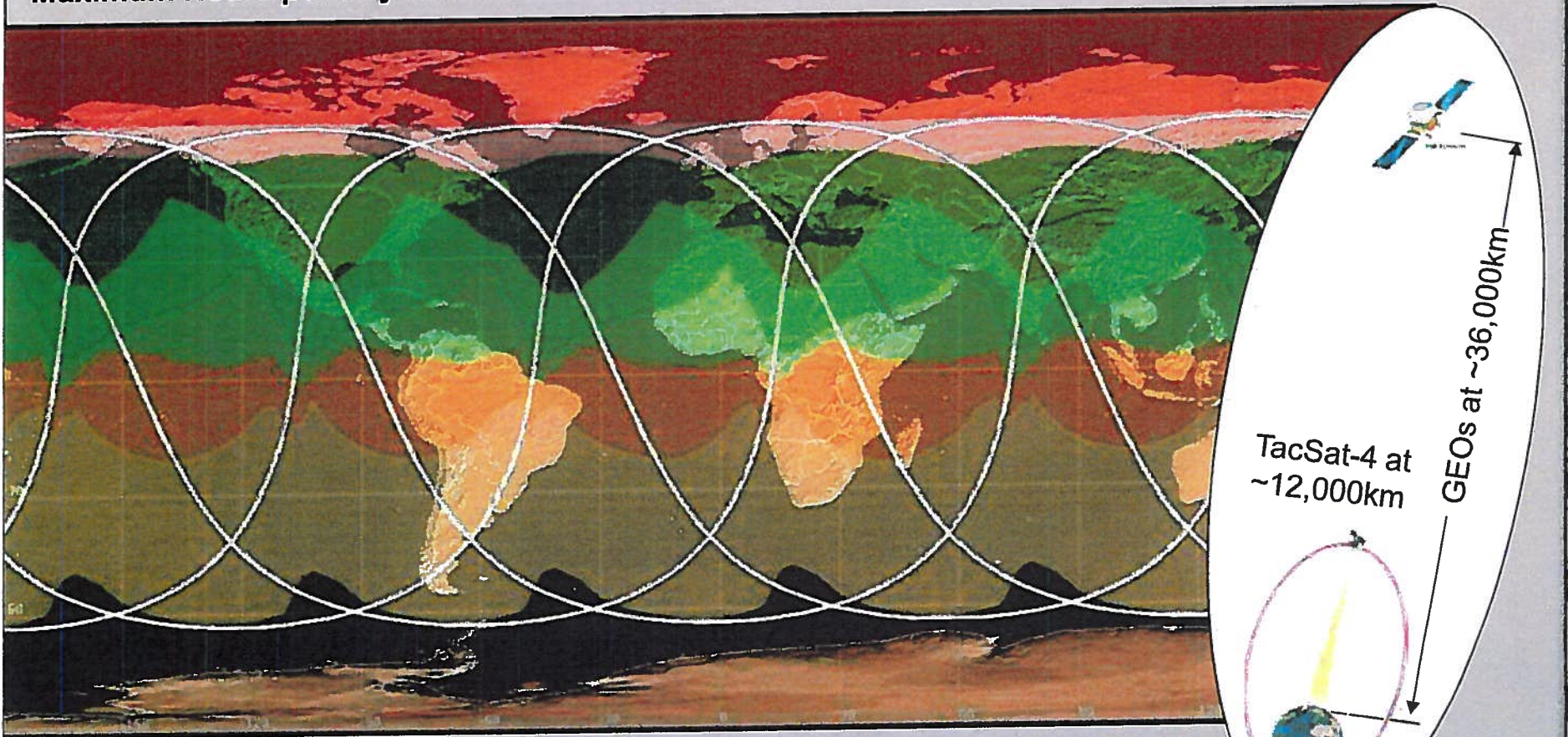


HEO-Low Two Satellite Coverage Map



TacSat-4 is an experimental DoD Communication Satellite that launched in 2011.

Maximum Hours per Day for a Given Location



A Given Location Typically Sees 3 Passes per Day Averaging 2 hours each Pass