

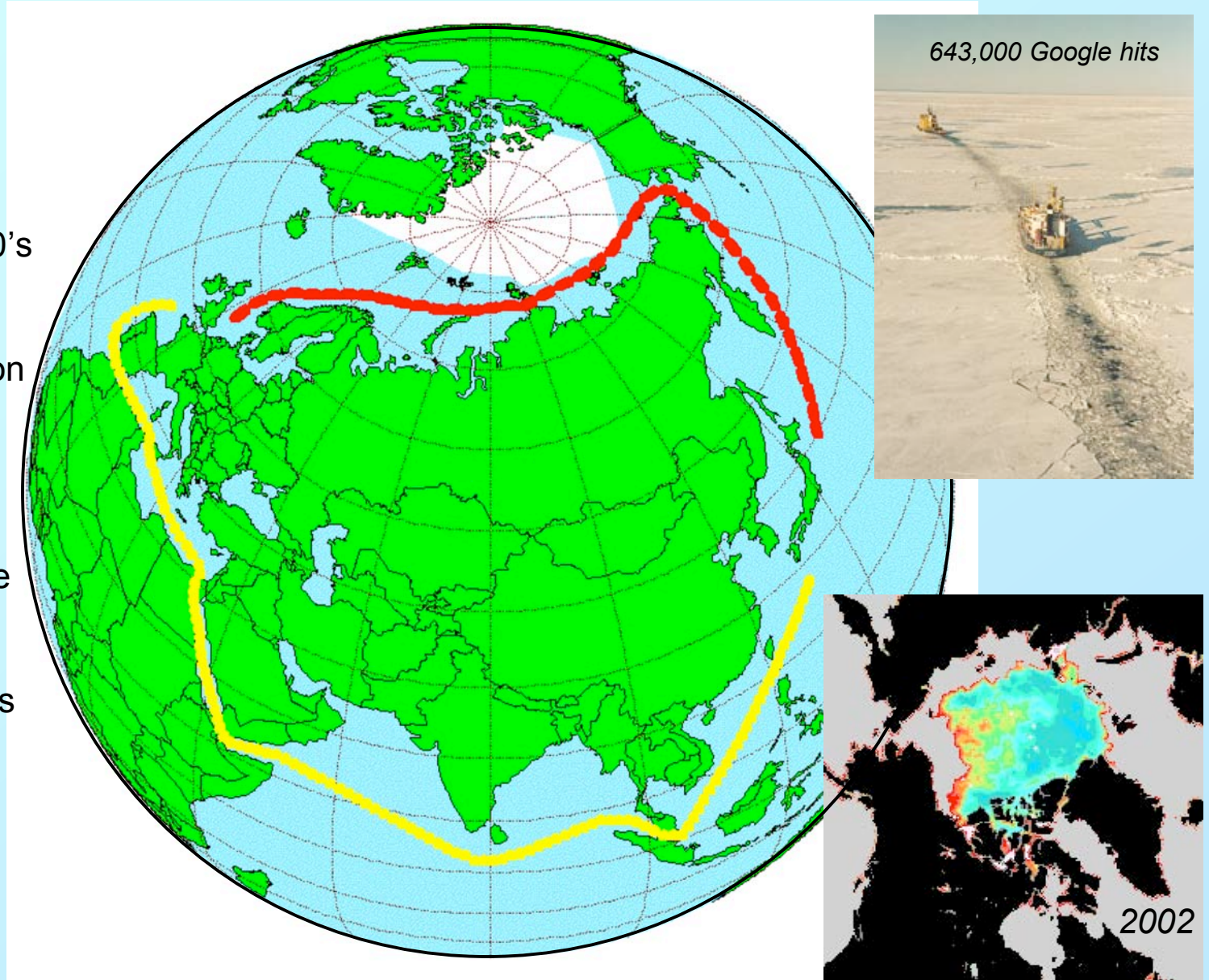
Opening of Arctic Sea Transport

Northwest Passage

- Modest activity

Northern Sea Route

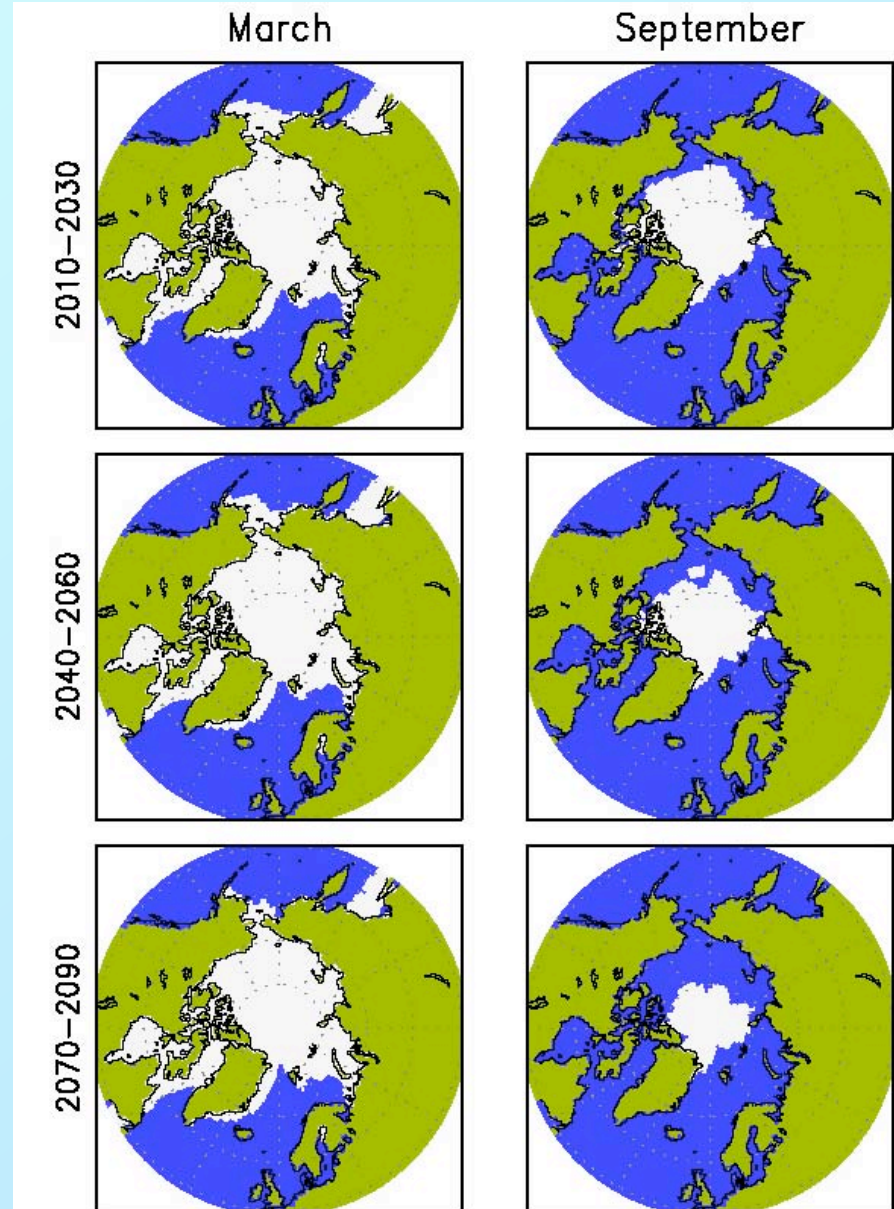
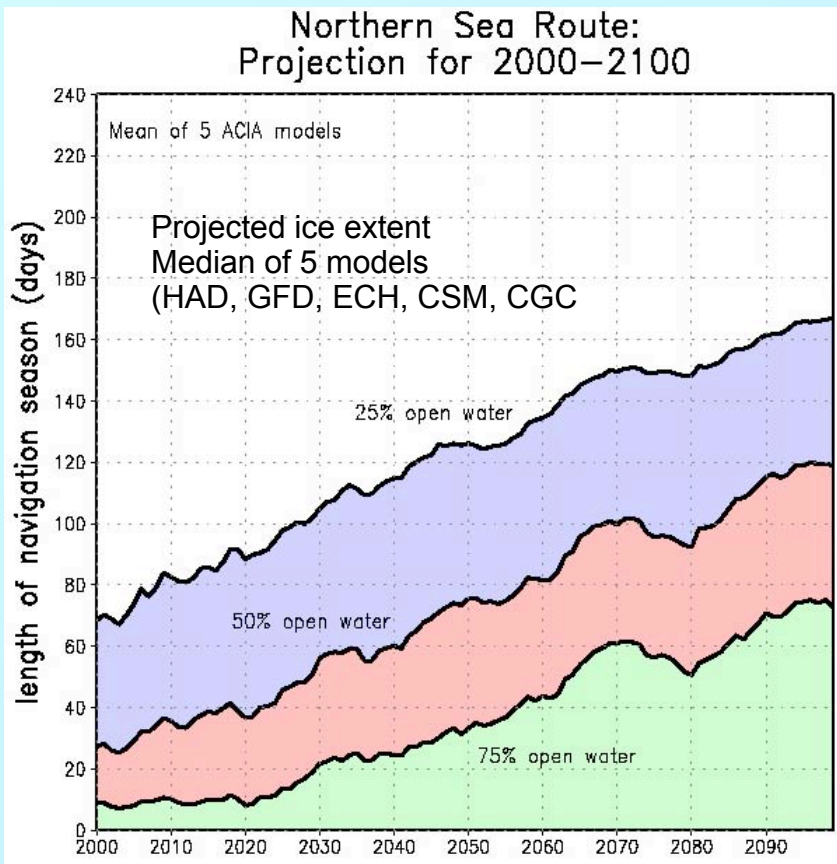
- Not new –since 1930's
- Primary purposes
 - local resupply
 - resource extraction
 - transit traffic
- Good news
 - Shorter by ~ 40%
 - 10 – 15 days
- Bad news – full of ice
 - increased hazard
 - slower speeds
 - need special ships



Transform an icy graveyard into a shorter shipping route

The Northern Sea Route: Tomorrow

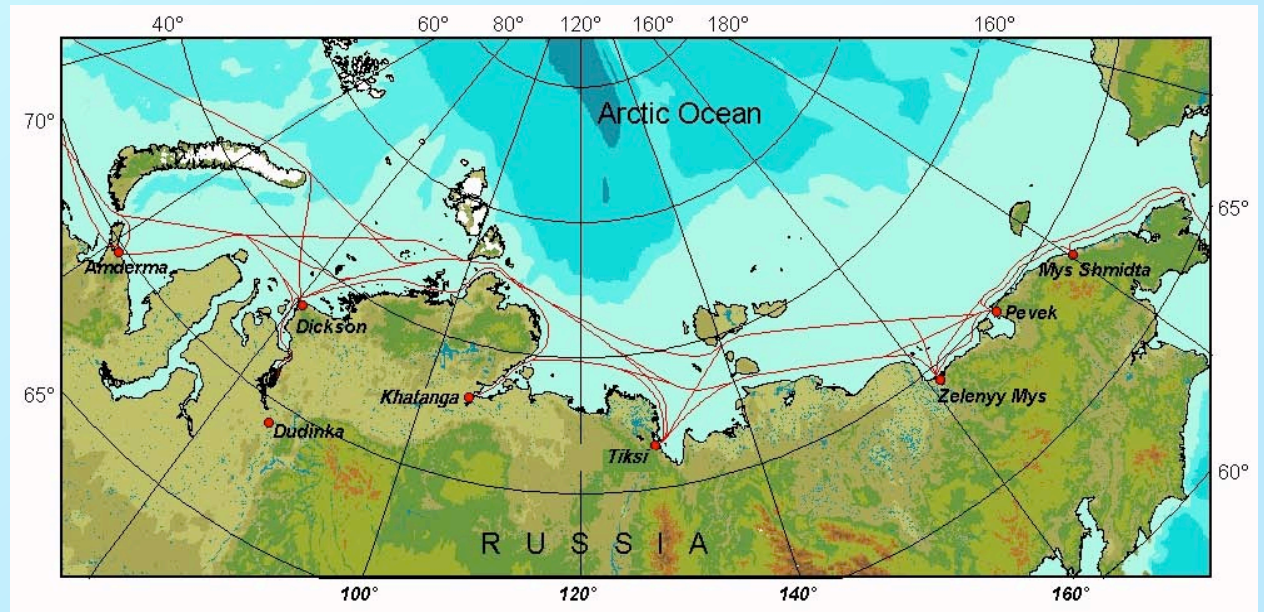
- Continued changes in the future
- Modest changes in winter
- Major reduction in summer
- Seasonal ice-free NSR



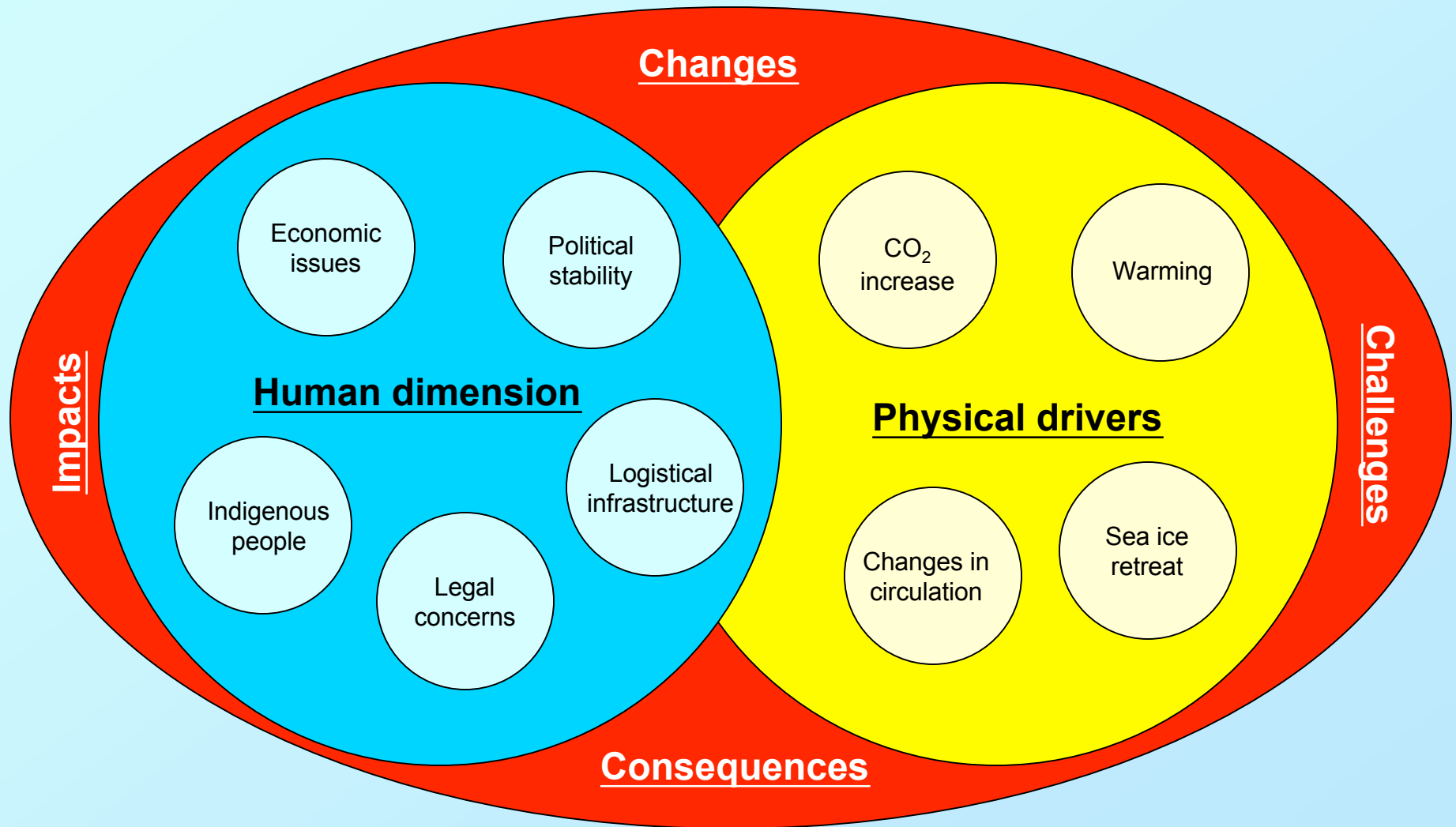
Conditions are improving, but shipping is declining

More is happening than physical changes

- Economic considerations
- Deteriorating ports and fleets
- Political situation
 - Fragmented institutions
 - Instability
- Legal issues
 - Insurance
 - Tariffs
- Environmental impact
- Societal consequences
- Impact on indigenous people
- External forcing – the rest of the world
 - Suez Canal
 - Pirates
 - Wars
 - Shortages



Critical for this synthesis effort



How is it all connected?