

Shell Offshore Inc.

# Arctic Exploration and Development: Challenges and Solutions

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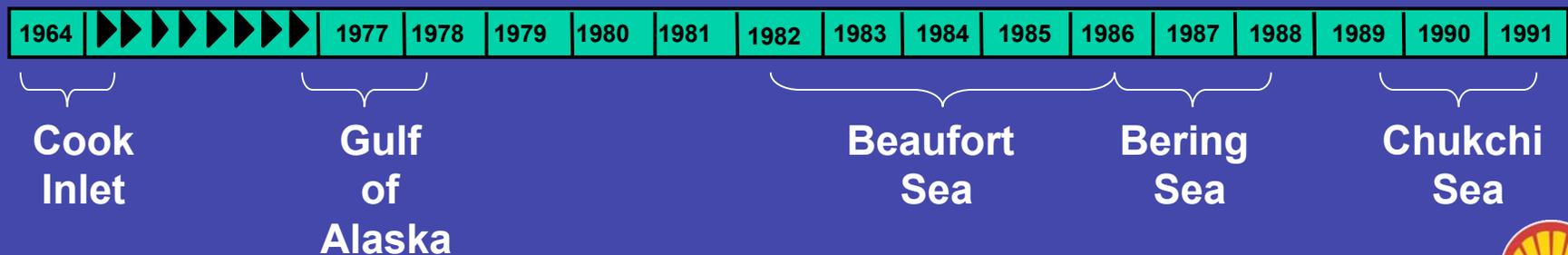
# Shell's Alaska Legacy

- 20 years sustained R&D
- 1<sup>st</sup> royalty payer to State of Alaska
- 2 producing fields in Cook Inlet
- 10 seasons of marine seismic
- 9 exploration discoveries
- 5 Beaufort gravel islands

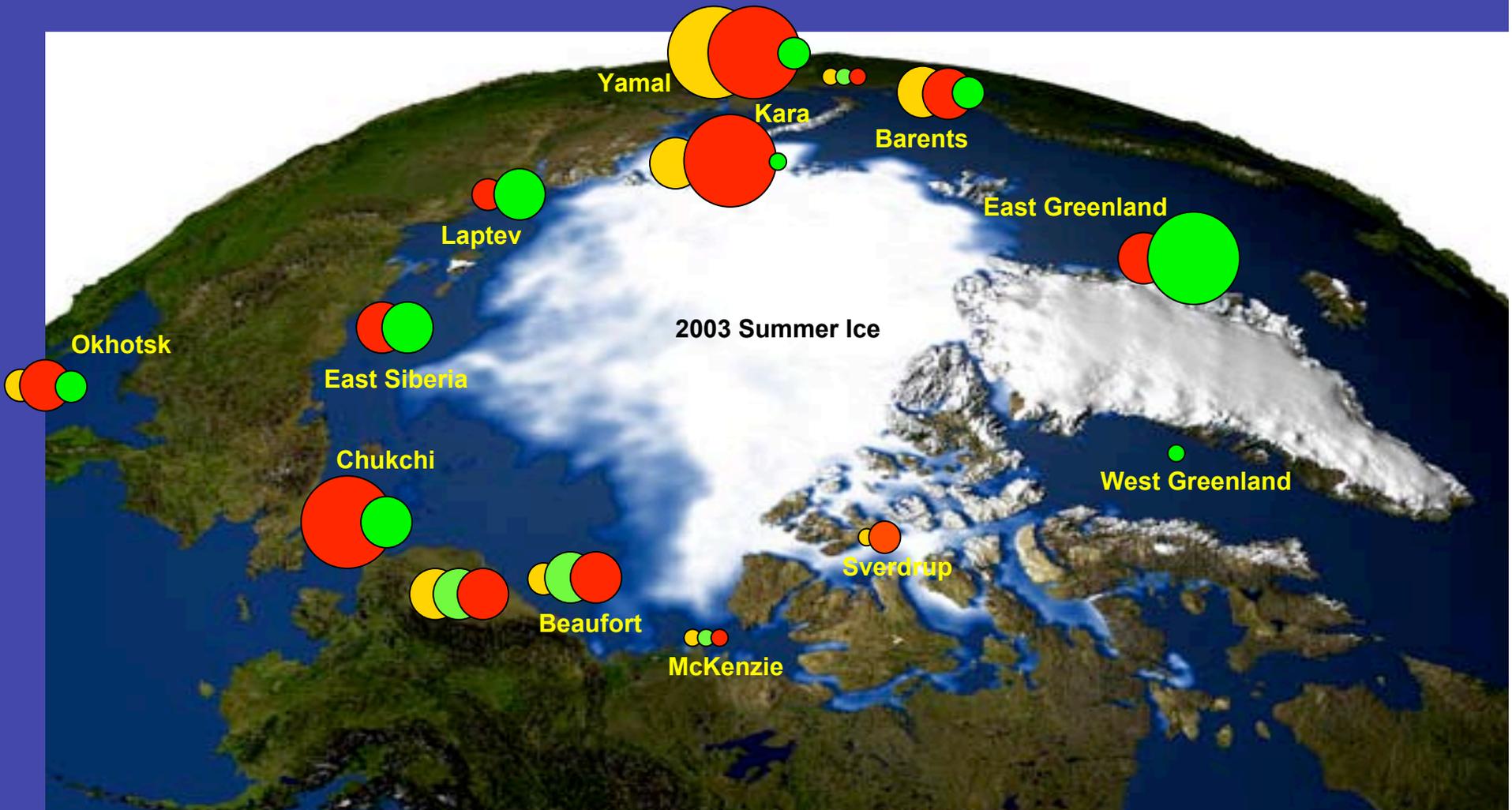
Tern Gravel Island  
Beaufort Sea



## Historical Drilling Activities



# Main Arctic Basins – Hydrocarbon Potential



Source: graphic – AMAP, data – USGS (modified)

# Arctic Challenges

- Health, Safety, Environment & Social Performance
- Engineering Solutions
- Gas Solutions
- Cost Effective Exploration



# Arctic Challenges

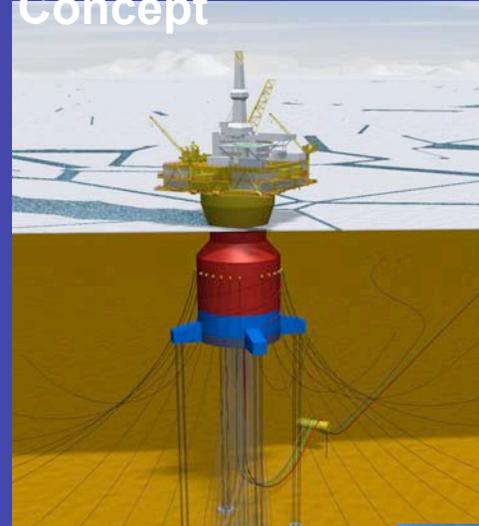
- Health, Safety, Environment & Social Performance
  - Sensitive environment
  - Safety
  - Indigenous people
- Engineering Solutions
- Gas Solutions
- Cost Effective Exploration



# Arctic Challenges

- Health, Safety, Environment & Social Performance
- Engineering Solutions
  - Remote locations
  - Short operating seasons
  - Extreme climate & ice
- Gas solutions
- Cost Effective Exploration

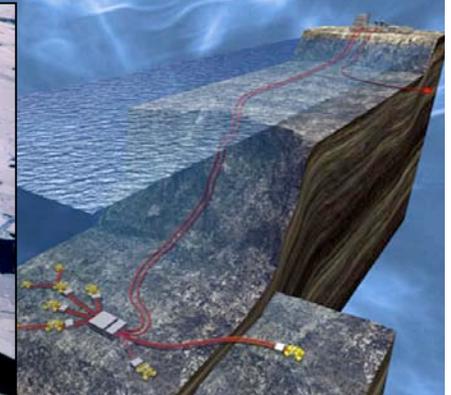
Arctic Platform  
Concept



Goldeneye



Sakhalin

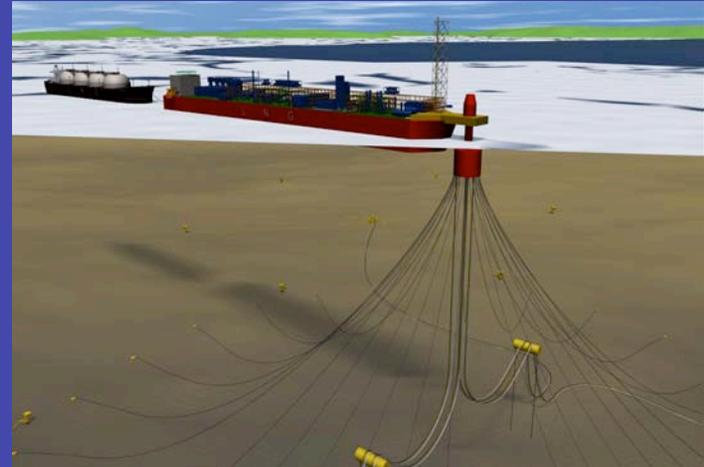


Ormen Lange



# Arctic Challenges

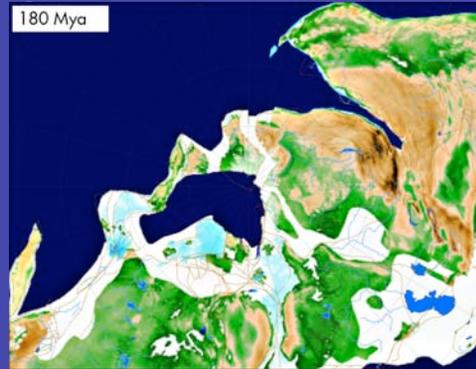
- Health, Safety, Environment & Social Performance
- Engineering Solutions
- Gas Solutions
  - LNG
  - Pipeline
  - Fair Access
- Cost Effective Exploration



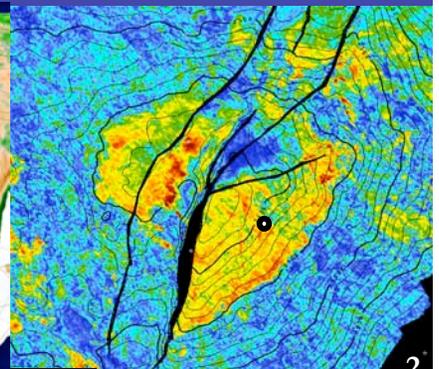
# Arctic Challenges

- Health, Safety, Environment & Social Performance
  - Engineering Solutions
  - Gas Solutions
- 
- Cost Effective Exploration
    - Regional studies
    - Advanced technology
    - Operational excellence

Regional



3-D Seismic



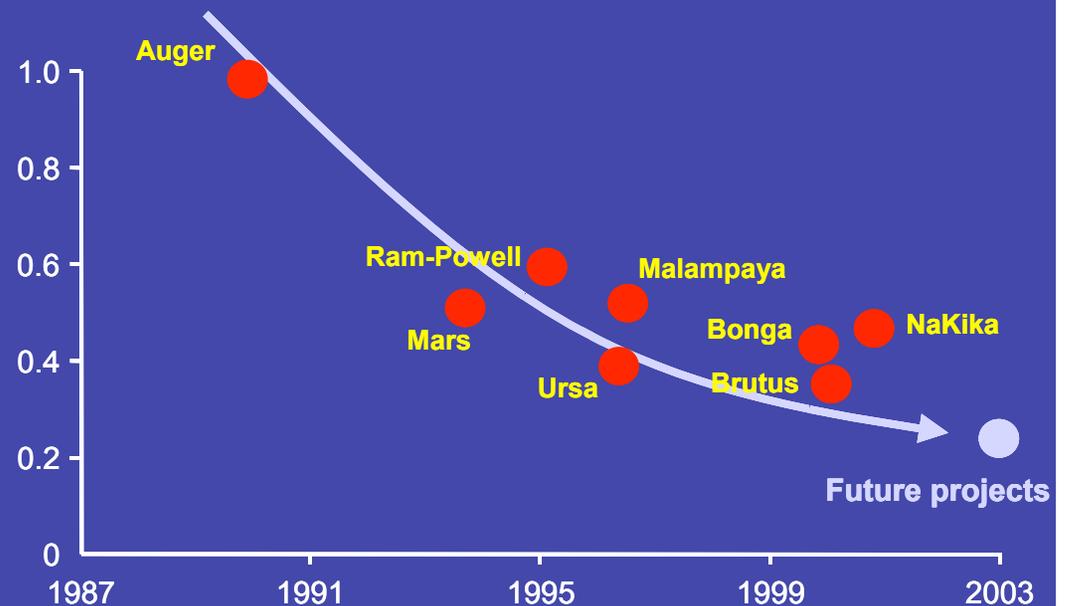
Real Time Operations Center



# Shell Arctic R&D

- Extending the Season
- Cost Reduction
- Systems Reliability
- Subsea Systems

Shell Historical Deepwater  
Cost/Unit of Production Capacity



# Shell Arctic Portfolio

Beaufort  
Sea,  
Alaska



Salym  
Russia



McKenzi  
e Delta,  
Canada



Sakhalin  
II,  
Russia



