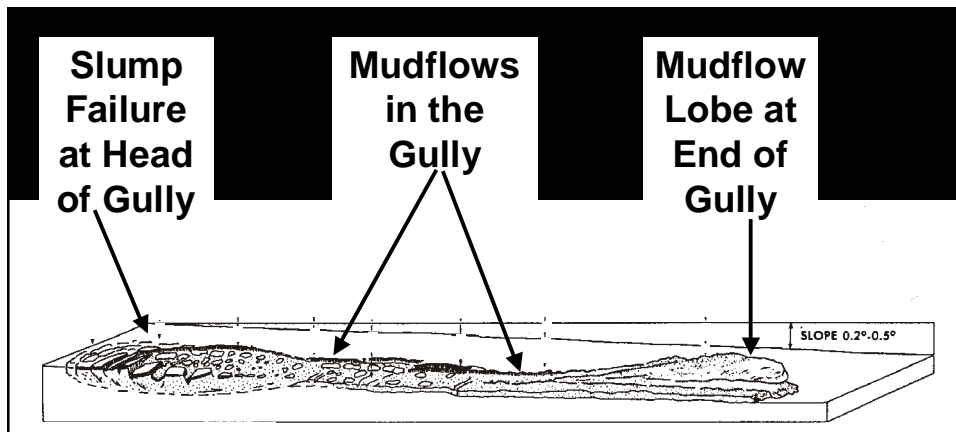


MISSISSIPPI DELTA PIPELINE SURVIVAL STRATEGIES

by
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BRIEF REVIEW OF DELTA GEOMORPHOLOGY FROM YESTERDAY



From Coleman et al, 1980

ELONGATE LANDSLIDES

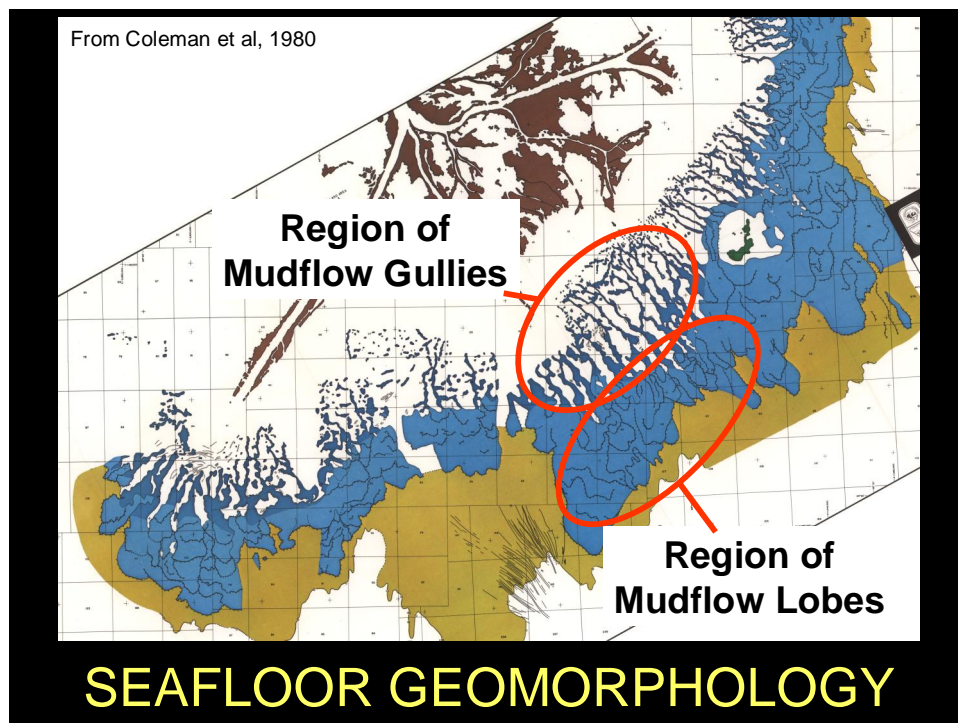
MUDFLOW ORIGIN, SEDIMENT
TRANSPORT, AND DEPOSITION

CHARACTERISTICS OF SEAFLOOR FAILURE FEATURES

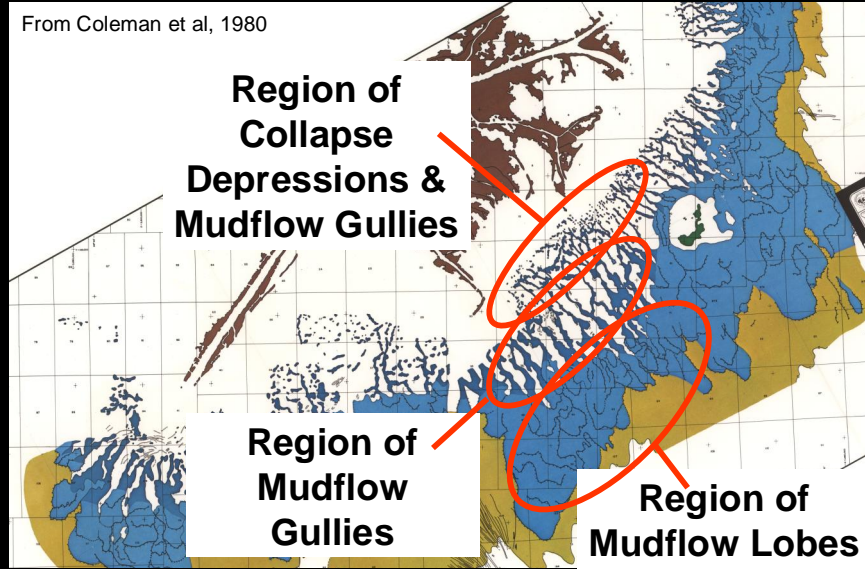
- **Mudflow gullies** tend to be geologically active. Down slope mudslide movements destructive to pipelines may occur at intervals from several times a year to once every few years.

CHARACTERISTICS OF SEAFLOOR FAILURE FEATURES (cont.)

- **Mudflow lobes** tend to be geologically active, but not (generally) as active as the gullies. Down slope mudslide movements destructive to pipelines may occur only every few years.

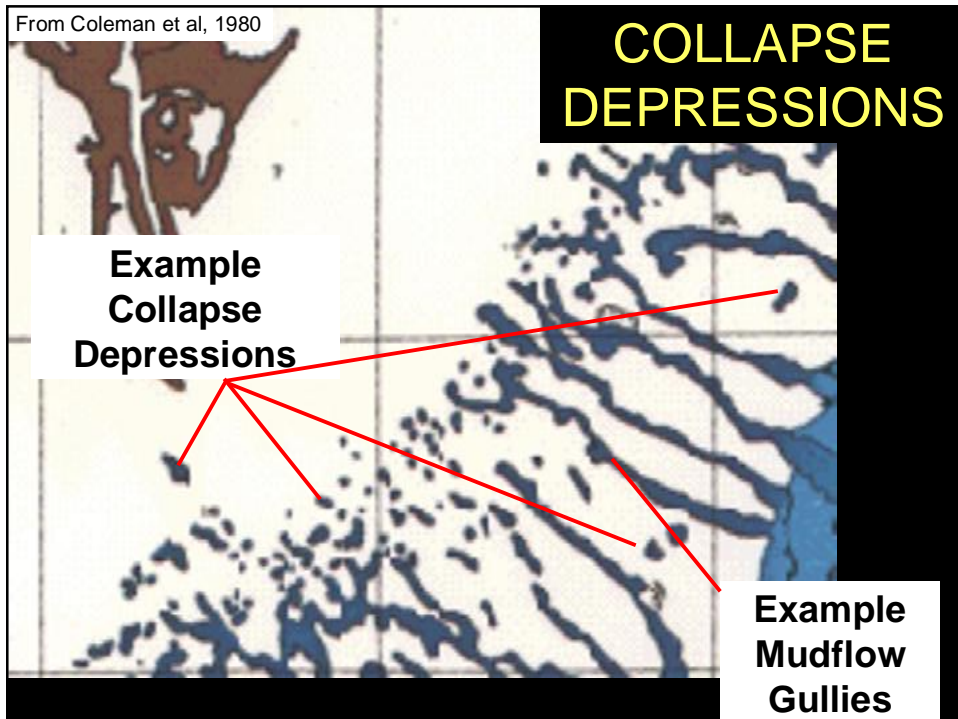


From Coleman et al, 1980



SEAFLOOR COLLAPSE DEPRESSIONS

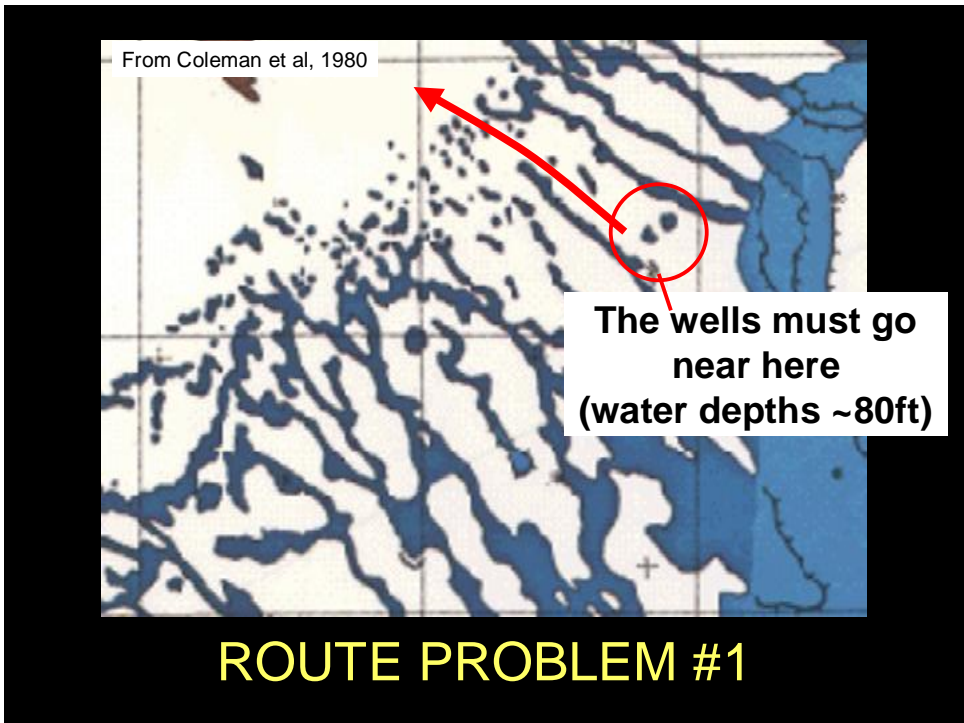
From Coleman et al, 1980



CHARACTERISTICS OF SEAFLOOR FAILURE FEATURES (cont.)

- **Collapse depressions** are locally enclosed seafloor failures that are generally bounded by low scarps.
- They tend to be as geologically active as mudflow gullies.
- Active depths of failure range from 10-20 ft to 40-60 ft.

CONSIDER THE
FOLLOWING PIPELINE
ROUTE SELECTION
SITUATIONS

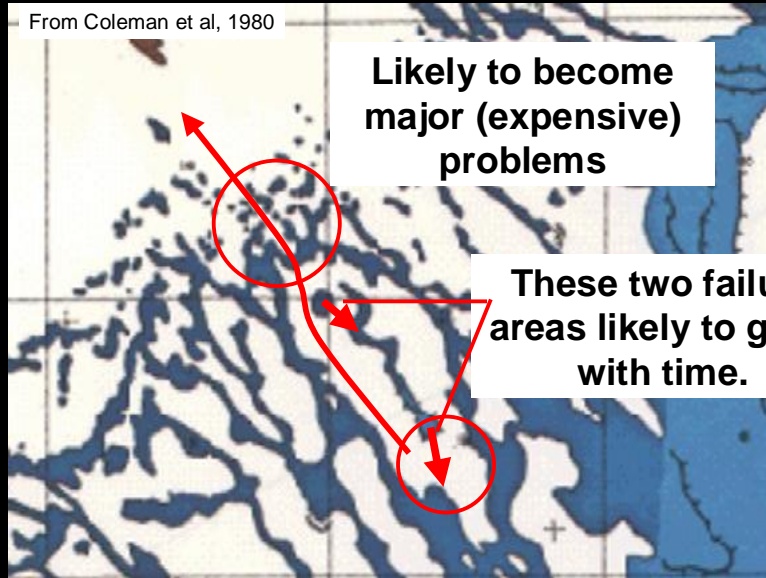


ROUTE 1 RISKS

- The pipeline may have to cross one or more collapse depressions.
- Seafloor lateral movements and/or loss of bearing support may cause periodic failures.
- Over a period of years, new collapse depressions may appear.

ROUTE 1 MITIGATION

- Failures are likely localized at collapse depressions, and the pipeline can be rerouted around the problem during early repairs, eliminating the problem.



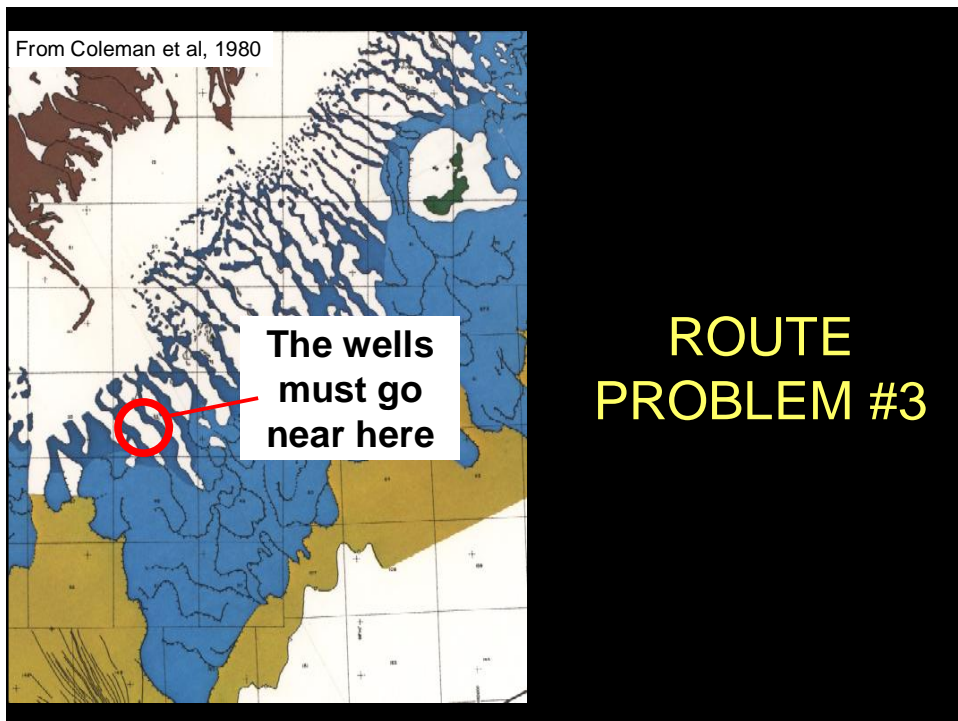
ROUTE PROBLEM #2

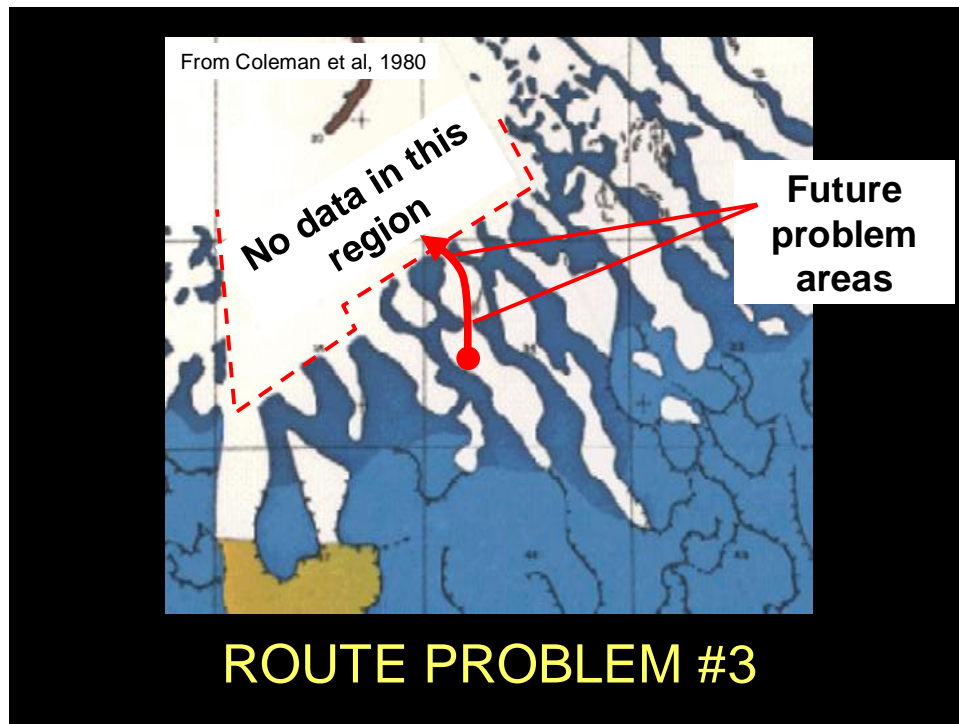
ROUTE 2 RISKS

- The pipeline must cross a mudflow gully plus several collapse features.
- Seafloor lateral movements in the gully and/or loss of bearing support in collapse depressions may cause periodic failures.
- Failure activity region may enlarge, depending on future hurricane wave activity.

ROUTE 2 MITIGATION

- Failures may be “fixable” over time, by local rerouting during pipeline repairs.
- On the other hand, conditions may get worse, and the pipeline may become an economic burden.





ROUTE 3 RISKS

- The pipeline must enter unmapped territory that is very likely to contain several mudflow gullies and numerous collapse depressions.
- The narrow “safe seafloor” regions along the route may be cut by growing mudflow gullies, creating major problem areas.

ROUTE 3 MITIGATION

- Failures may be “fixable” over time, by local rerouting during pipeline repairs.
- On the other hand, conditions may get worse, and the pipeline may become an economic burden.

