Best Management Practices Applied to Dredging Projects for Environmental Protection

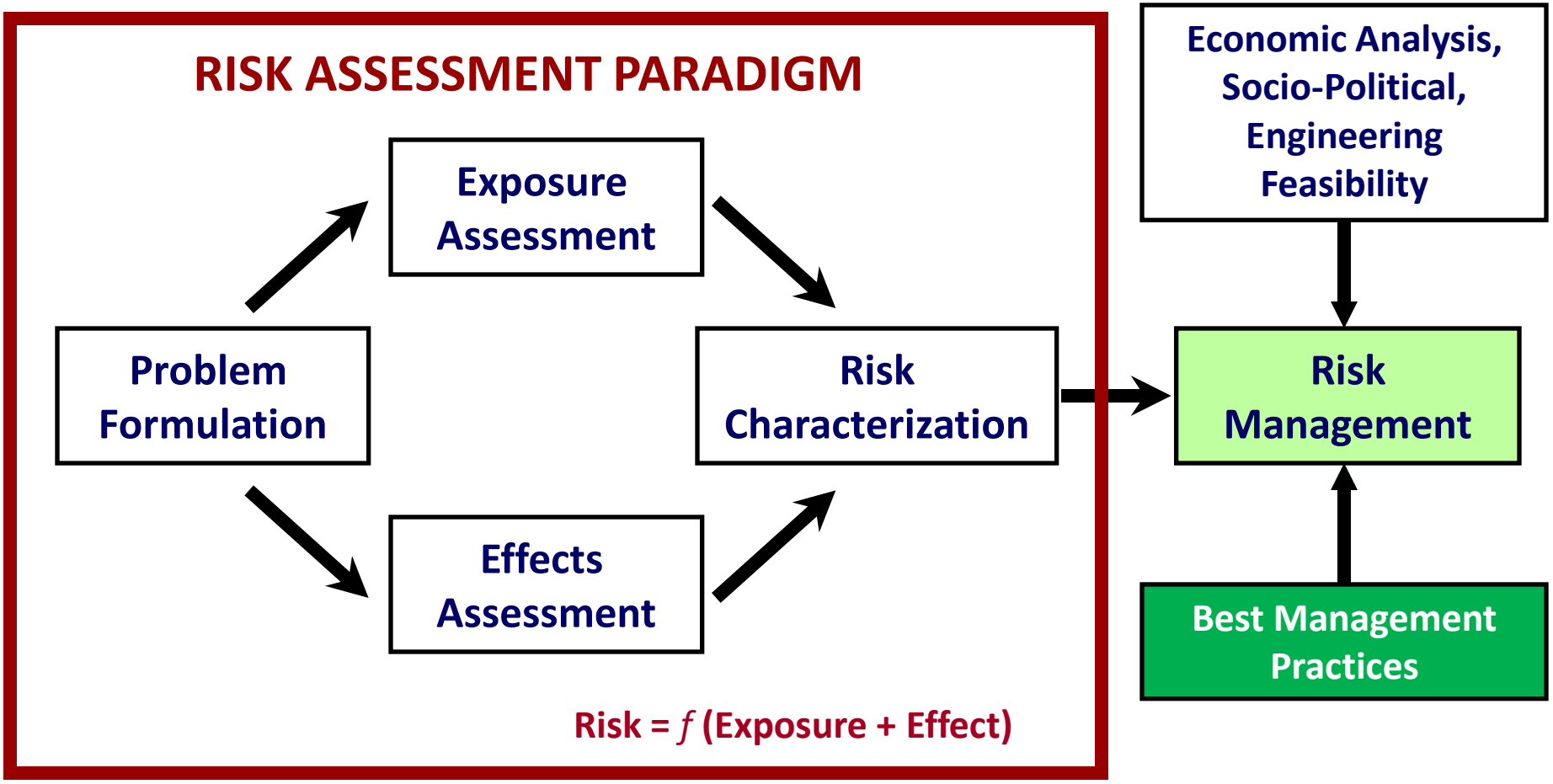
Doug Clarke

Engineer Research and Development Center

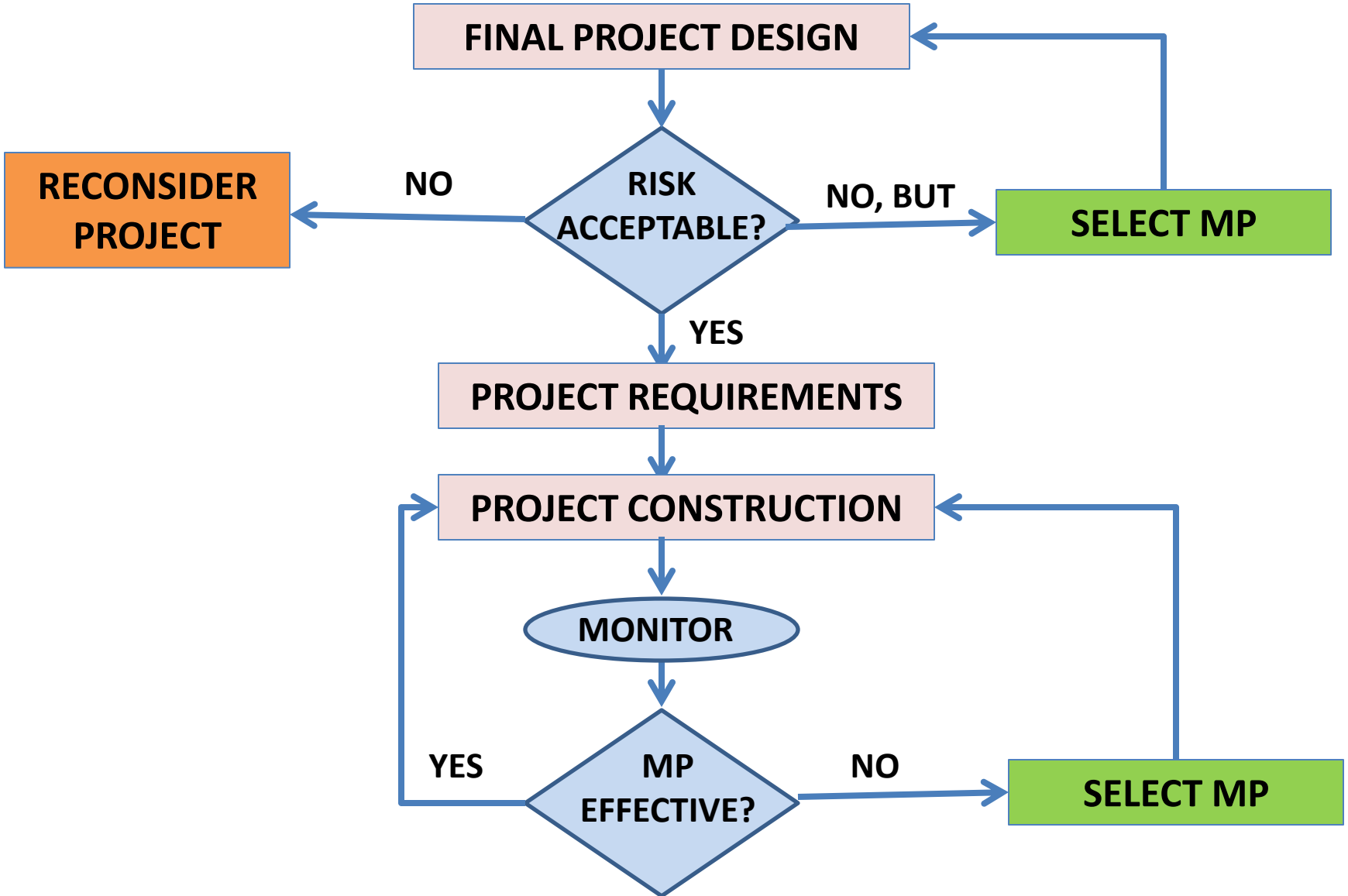
Environmental Laboratory

- ***Management Practice*** – A practice intended to improve the environmental performance of a dredging project, inclusive of excavation, transport, and placement of dredged material.
- ***Best Management Practice*** – A management practice, or combination of management practices, that is determined after impact assessment, examination of alternative practices, and appropriate stakeholder participation to be the most effective, practical, and sustainable means of achieving an environmental protection objective.

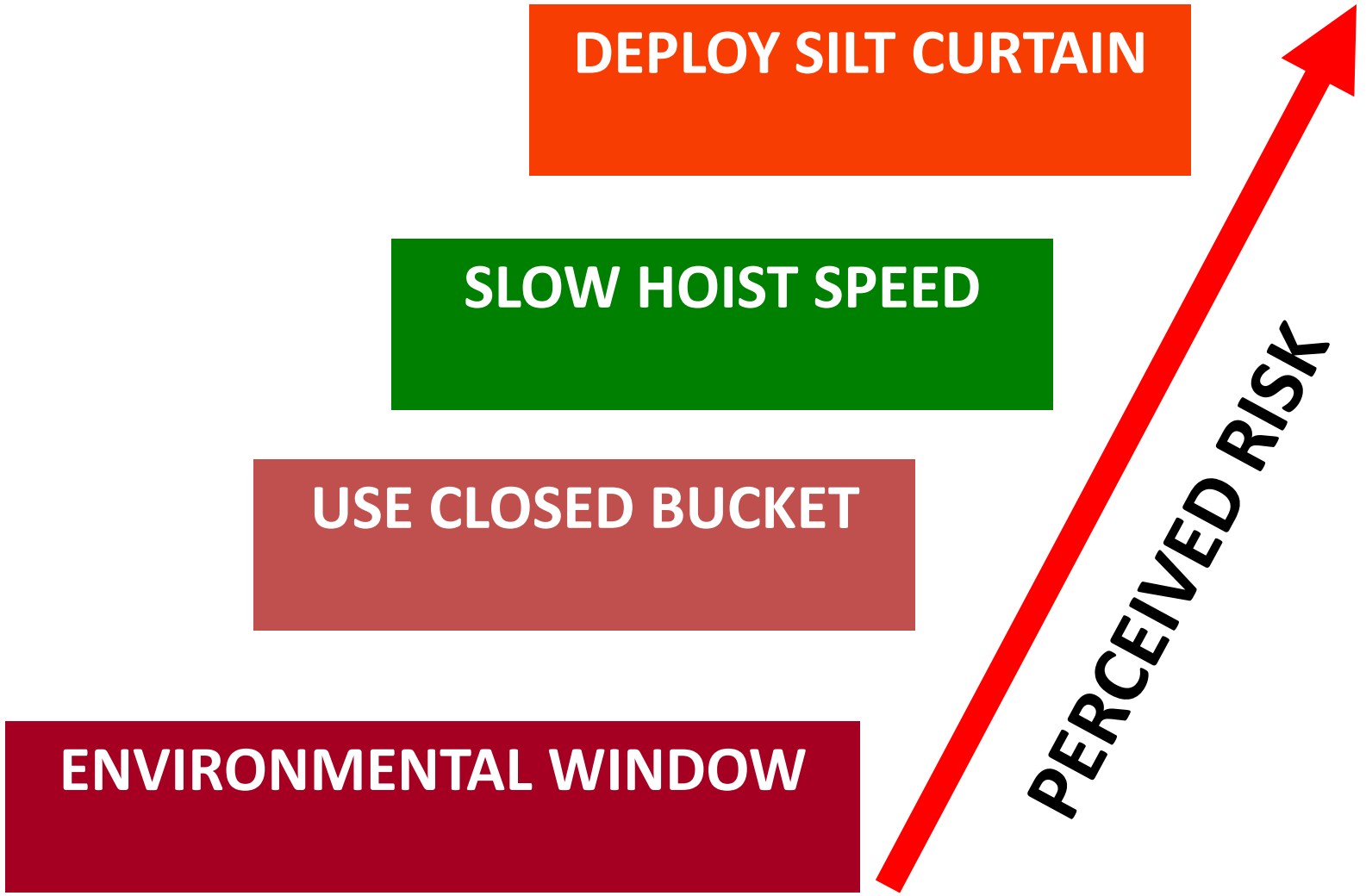
RISK FRAMEWORK



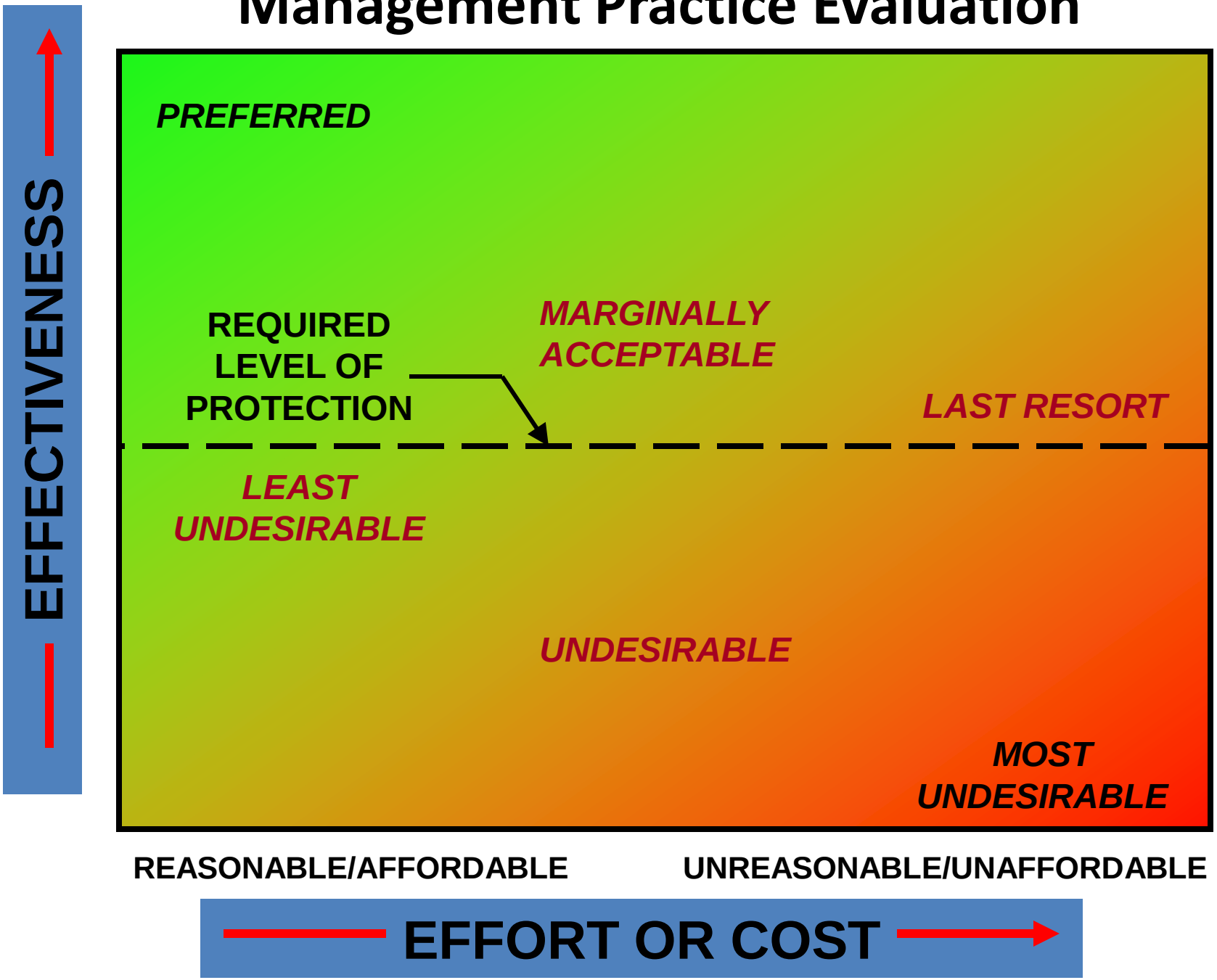
MP Evaluation and Selection



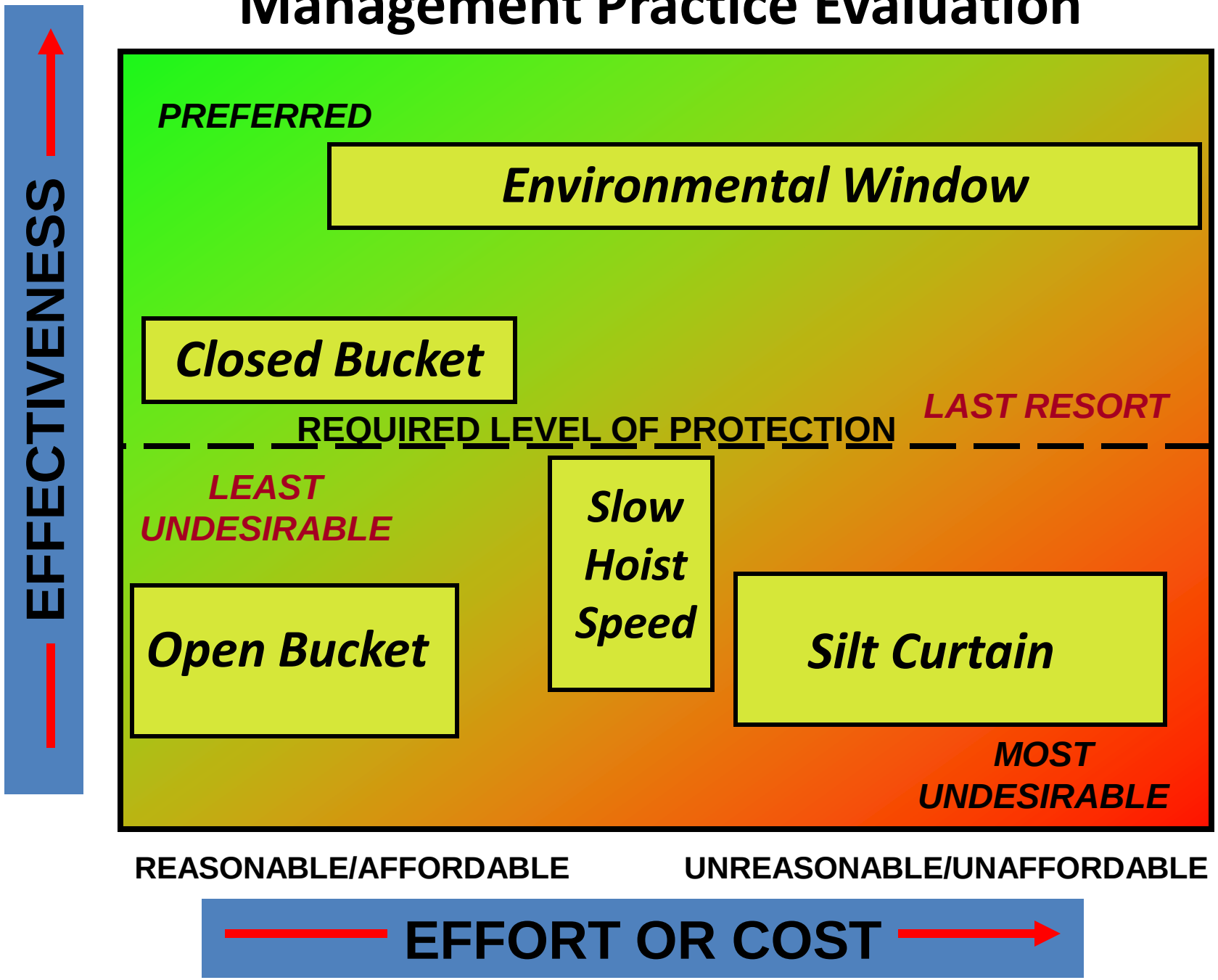
“BEST” or “BAD” Management Practice?



Management Practice Evaluation



Management Practice Evaluation



Equipment-Related MPs

- Select appropriate dredge type and size
  - mechanical or hydraulic
- Apply appropriate modifications
  - hopper dredge degassing system
  - hopper dredge green valve
  - hopper odor controls
  - turtle deflectors and/or observers
  - aerial noise controls
  - bucket type
- Equipment maintenance
  - inspections
  - maintenance of seals, winches, etc.

OPEN 12 CU YD BUCKET

CLOSED 18 CU YD
“ENVIRONMENTAL” BUCKET

CLOSED 32 CU YD BUCKET

Dredging Process-Related MPs

- Modify rate of operations
  - bucket ascent or descent speed
  - reduce over-dredging by bed leveling
- Limit or prevent hopper/barge overflow
- Limit fill of barges
- Restrict temporal aspects of operations
  - season, tide, day/night
- Provide spatial buffer zone

Placement-Process MPs

- **Pipeline discharge controls**
  - **baffle plates, diffusers, tremie tubes, spreaders**
  - **optimize discharge rate and solids density**
- **Optimize CDF operations**
  - **use additives or flocculants**
  - **settling basin weir layout**
- **Spill controls for off-loading**

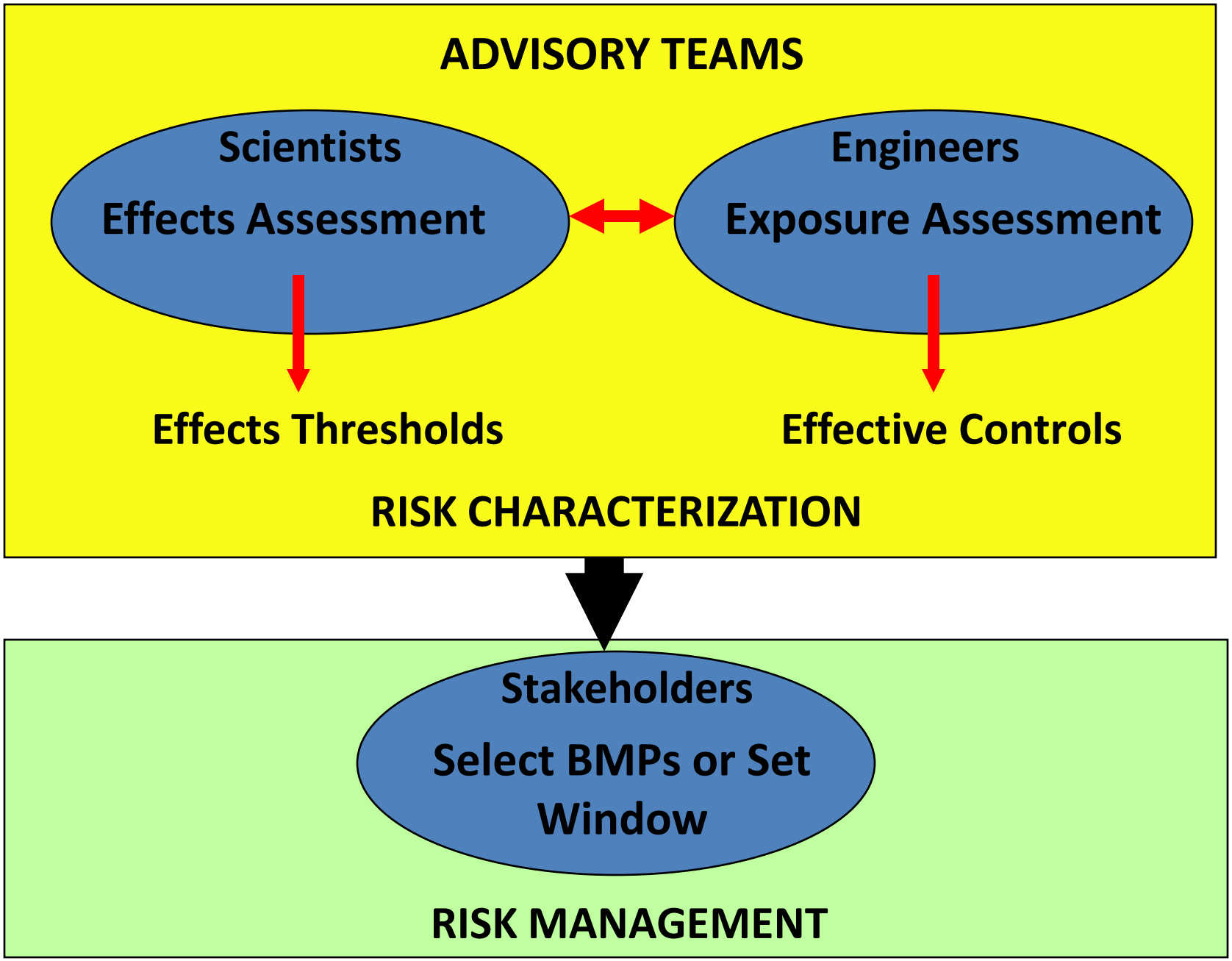
Control-Related MPs

- Use silt curtains, sheet piling, or bubble curtains
- Use surface booms
- Provide emissions controls
- Control ballast water
- Provide spill prevention/response plans
- Provide debris, waste, ordnance, cultural resource management plan

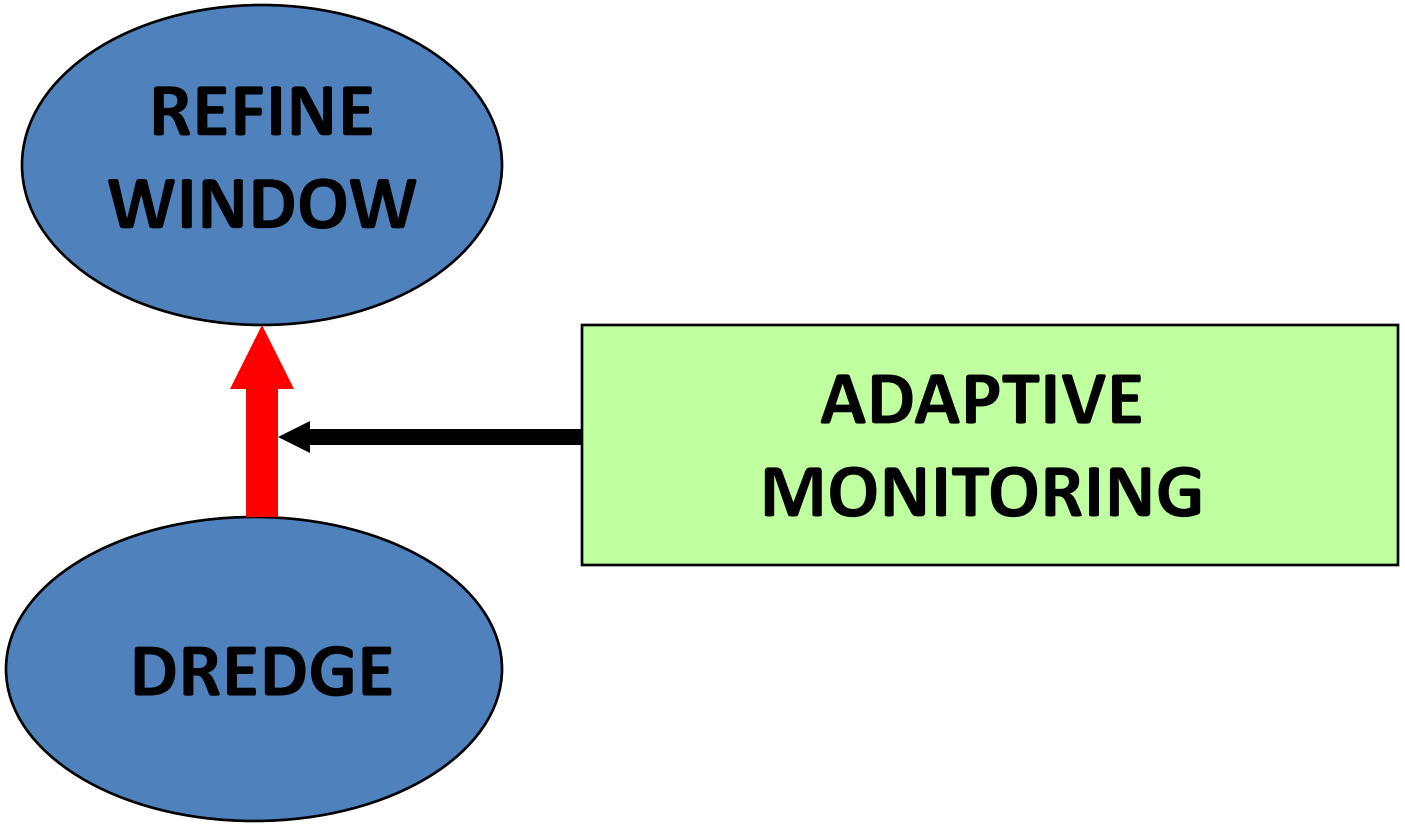
SILT CURTAINS

REMEDIAL DREDGING APPLICATION

NAVIGATION DREDGING APPLICATION


ADVISORY TEAMS
Scientists
Effects Assessment
Engineers
Exposure Assessment
Effects Thresholds
Effective Controls
RISK CHARACTERIZATION
Stakeholders
Select BMPs or Set Window
RISK MANAGEMENT

Inserting Science



Recommendations

- Seek science-based, adaptive alternatives to windows
- Obtain commitments to resolve major concerns and knowledge gaps
- Explore ecological risk-based methods to setting windows
- Increase understanding of the dredging process
- Increase awareness of conservation needs among dredgers