

From the science write-ups:

PO:

Measurement of atmospheric fluxes
Measurement of upper ocean (1 m) properties
Collection of high resolution bathymetry
Ability to sample near bottom (5 m) properties while underway
Ability to towed instruments
Deploy/retrieve multiple autonomous vehicles
High bandwidth telecommunications (data/model transfer)

Bio:

Gene sequencing machines – seaworthy
High resolution towed packages
ROV/AUV platforms
Fiber optic cables
Data communications/ship-shore-ship
Larger science parties – more lab space – flexible design of labs

MG&G:

High resolution swath bathymetry
High resolution subbottom profiling
Piston coring
High resolution navigation
ROV/AUV
Ability to carry portable geophysical packages (gravity/magnetics)
Dynamic positioning

CO:

Ability to do high precision analytical chemistry
Specialized sampling protocols
Contaminant free seawater
AUV
Gas sampling
Seasurface microlayer sampling
Multiship operations
Sampling of sediment interface
Basin-scale sampling

Education:

High bandwidth communications; 24/7 internet connectivity
Workspace for teachers/communicators
More bunks for teachers/students
Easy gangway access for open houses

SMRs:

Vibration minimized for mounting sensitive instrumentation

Conference room with good lighting, video capability, etc

Good speed control for towing packages (ship and winches)

Good sea keeping/station keeping (dynamic positioning)

Flexible designed labs

Highbay/hanger (for RC, could be part of wet lab)

Climate control workspace/chamber

Bubble-free uncontaminated seawater

Mast for met packages mounted where air mass is disturbed as little as possible

High speed communications (data, video, etc)

Acoustically quiet as feasible

Subbottom profiler

Multibeam swath system

The only difference between the two classes is related to the size and resulting capabilities (i.e., mid-water depth multibeam vs full water depth multibeam mapping systems).