References:

Incompressible Flow and the Finite Element Method, Volume 1

P.M. Gresho, R.L. Sani, April 2000

Questions to Investigate:

What is a good test basin for comparison?

What are its features?

Is there good data for comparison to real flow behavior?

If not, how can this data be obtained?

Should thermodynamic considerations be included in the calculations? (ice formation and elimination, diurnal and seasonal effects, ice element material property time dependence etc.)

Do interstitial regions affect flow behavior (non-homogenous heating etc.)

Does the existence of interstitial regions affect element expiration?

What are the mechanical properties of ice?

How should deformation at the element boundaries be handled?

Should this information follow the element?

How does this deformation affect flow properties?

How should the shape of the elements be handled?

Is this a necessary factor, or can the number of elements effectively remove this constraint?

If ‘random’ shapes are not required, is a disc the preferred element geometry?

What is the model that defines contact forces?

How should the DEM be coupled to the ocean model and atmospheric models?

What are the governing principles of ice flow behavior?

How are ice flow mechanics handled currently in the models? What parameterizations are being validated?

Should elements be allowed to overlap one another (through subduction type interactions)?

How difficult would it be to incorporate probabilistic distribution considerations into the model? Would this come at significant computational cost?