Relatively warm Circumpolar Deep Water (CDW) can be found near the continental shelf break around most of Antarctica. Advection of this warm water across the continental shelf to the base of floating ice shelves is thought to be a critical source of heat for basal melting in several locations. Understanding the mechanisms involved in bringing this water mass onto the continental shelf is important in trying to determine how future climatic change will affect the basal melt of some ice shelves. Mooring data in Marguerite Trough on the western Antarctic Peninsula (WAP) continental shelf show an intrusion frequency of 4 intrusions per month with the typical duration being 1-3 days (Moffat et al., 2009). A 4-km resolution regional ocean/sea-ice/ice shelf model of the WAP coastal ocean shows similar intrusion behavior with 2-3 intrusions per month with an average duration of 1-4 days. The model solutions have a significant correlation between the along shelf break wind stress and the CDW flux through Marguerite Trough suggesting that intrusions are at least partially related to short duration wind events. A 1-km resolution (eddy-resolving on the shelf) generic shelf/trough/ice shelf domain model produces warm core eddies that also intrude upon the continental shelf with a frequency that matches observations (4 per month) and advect heat along the trough and into the ice shelf cavity. However, as this model has no wind forcing, there is obviously some mechanism other that the wind that helps to set the time scale of the intrusions.