Integrated models claim to simulate coupled behaviour of several compartments and processes in a system. They must thus also be validated for these internal variables and not only for the integrated output, which could be resulting from several combinations of internal variables and compensating errors. The Hydrological Predictions for the Environment (HYPE) model is applied for the entire country of Sweden (450 000 km²) with a resolution of some 10 km². The purpose is to serve water authorities with hydrological information needed for assessments of water status. Results are provided through web portals for free downloading or for scenario simulations through a web model-interface, where the catchment processes are further coupled to a biogeochemical coastal-zone model. The hydrological model integrates major water storages below and above ground, interacting flow paths and concentrations of nutrients and carbon. It is a semi-distributed process-based mass balance model, using the hydrological response unit concept and step-wise simultaneous calibration for the entire domain. For the evaluation of model performance, different national monitoring programmes with information in hundreds or thousands of sites are used, representing different environments and often different time-periods and sampling frequency. However, when compiled for the whole model domain and time-period, the multi-variable evaluation gives an idea of model performance and can help to identify weaknesses in the model concept or calibration procedure. The present study compares the nation-wide modelled data with observed values for evapotranspiration, snow storage, groundwater levels, river discharge, lake-water levels, and nutrient concentrations.