Command Reference: WriteReclamationHDB()

Write time series to a Reclamation HDB database

Version 10.24.00, 2013-09-27

The WriteReclamationHDB () command writes time series to a Reclamation HDB database:

- a single time series (which can be part of an ensemble), indicated by the individual time series identifier:
 - o a "real" time series (observations)
 - o a "model" time series (output from a model)
- all time series in an ensemble, indicated by the ensemble identifier:
 - o ensemble trace time series are stored as "model" time series, with additional ensemble metadata

See the ReadReclamationHDB() command documentation for information about reading the time series that are written by this command. See the **Reclamation HDB Data Store Appendix** for more information about the database features and limitations. Command functionality includes:

• Time series metadata/new time series:

- o In general, the command will not define a new time series (site and model data). It is expected that time series previously have been defined in the database. This ensures that TSTool can perform error handling and users do not accidentally load new time series.
- o The exceptions are:
 - New ensembles and corresponding trace time series can be defined by specifying ensemble name, trace number, and model run date using the NewEnsembleName and NewEnsembleModelRunDate command parameters.
 - New (non-ensemble) time series corresponding to a new run date can be defined by specifying the model run date using the NewModelRunDate command parameter.

• Date/time handling:

- TSTool uniformly uses the time at the end of the recorded interval for data values (instantaneous time or end of interval for mean and accumulated values), whereas HDB uses the time at the beginning of the recorded interval for hourly data. See the *ReclamationHDB Datastore* appendix for more information.
- Writing NNour data uses WRITE_TO_HDB procedure where the SAMPLE_END_DATETIME is set to the TSTool date/time and SAMPLE_DATE_TIME is set the TSTool date/time minus NHour.
- O Writing other than NHour data uses the WRITE_TO_HDB procedure with SAMPLE DATE TIME passed as the same value as the TSTool date/time.

• Updating time series records:

Time series data records for an existing time series will be updated if previously written.

Missing data:

Missing data currently are not written. By convention missing values in HDB are simply not included in the database. Currently the command will not delete previous records if the new value at a date/time is missing. It would be useful to have the ability to clear the time series values in the write period before inserting the new values. This would ensure that the data are current.

• Data units:

O Data units in the time series are not checked against data units in the database because the units in TSTool data may originally have come from various sources that do not use the same units abbreviations as HDB. It is the user's responsibility to ensure that time series that are being written have units that are compatible with HDB.

• Data flags:

Data flags from the time series are not written to the database. The ValidationFlag, OverwriteFlag, and DataFlags parameters are provided to specify HDB flags. Additional capability may be added in the future.

• Time zone:

o Time zone can be indicated in TSTool time series by including in the start and end date/time information; however, time zones are difficult to standardize when data comes from different sources. The default time zone for HDB is configured for the Reclamation office that uses the database. If the time series time zone is different from the default (displayed in the note for the TimeZone command parameter in the command editor), it can be specified as a command parameter. It is the user's responsibility to verify that the correct time zone is being provided to the WriteReclamationHDB command.

• HDB data table:

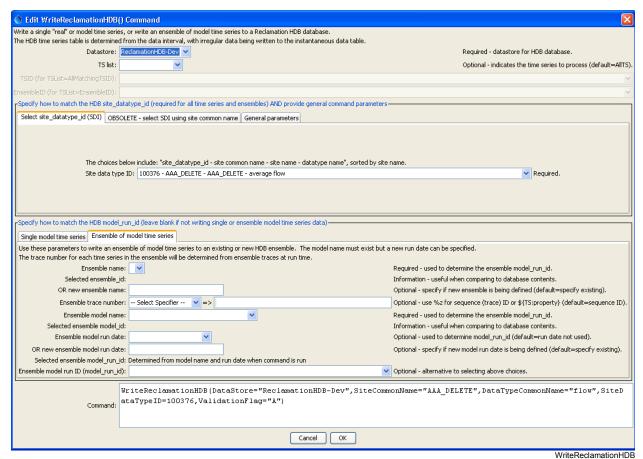
- The time series interval is used to determine the HDB time series table to write, with irregular data being written as instantaneous data with date/time precision to minute.
- TSTool treats year-interval data generically and does not manage water year (or other types of years) in special fashion, other than when processing data into year interval time series. Water year data can be saved in year interval data but currently there is no way to write to the water-year tables in HDB.

HDB database procedure:

- O The HDB WRITE_TO_HDB stored procedure is used to write individual time series data records:
 - The time series is written to a model time series table if model parameters are specified
 - The model run date, for single time series and ensembles, is truncated to minutes in time series identifiers and for query purposes.
- When writing ensembles, the HDB procedure
 ENSEMBLE.GET_TSTOOL_ENSEMBLE_MRI is used to determine the model run
 identifier corresponding to model time series and then the WRITE_TO_HDB procedure
 (above) is used to write data records:
 - The ensemble name is determined from the EnsembleName parameter (or NewEsembleName parameter if creating a new ensemble) existing names can be selected or a new name can be specified
 - The trace number is determined from the EnsembleTrace command parameter, and will result in the trace being taken from specific time series properties. Currently this must be an integer but in the future string trace identifiers may be supported (TSTool uses string identifiers internally).
 - The model name is determined from the EnsembleModelName parameter.

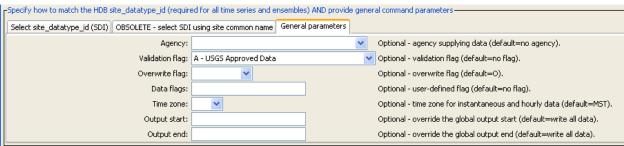
 Model names consistent with non-ensemble model time series are used.
 - The model run date is determined from the EnsembleModelRunDate parameter (or NewEnsembleModelRunDate parameter if writing data for a new run date). If specified then the P_IS_RUNDATE_KEY procedure parameter is set to Y, if not specified it is set to N). Consequently, ensemble time series can be written with our without a model run date.

The following dialog is used to edit the command and illustrates the syntax of the command when writing "real" data, in which case model information in the lower panel are not specified. Currently the site_name and site_common_name are not required to be unique in HDB and therefore specifying the unique site_datatype_id (SDI) is the only way to ensure that the proper time series is being selected (unique constraints for the names may be added to the database in the future).



WriteReclamationHDB() Command Editor for "Real" Time Series

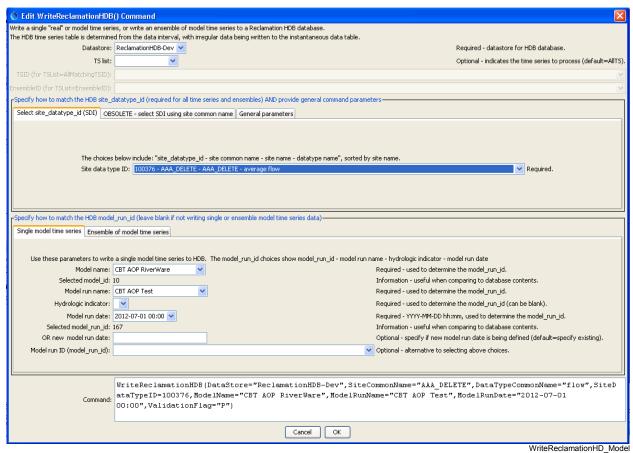
The following figure illustrates general command parameters.



WriteReclamationHDB_General

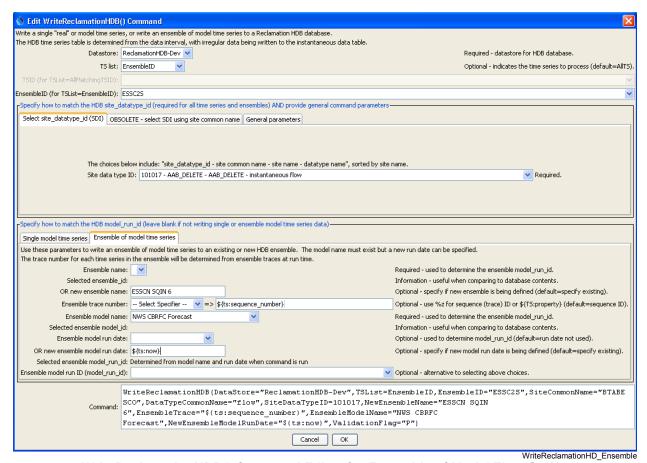
WriteReclamationHDB() Command Editor for General Parameters

The following figure illustrates the syntax of the command when writing "model" data for a single time series, in which case the model parameters are specified via the **Single model time series** tab.



WriteReclamationHDB() Command Editor for Single Model Time Series

The following figure illustrates the syntax of the command when writing an ensemble of model time series, in which case ensemble and related model parameters are specified via the **Ensemble of model** time series tab. The TSTool ensemble to write is specified with the TSList=EnsembleID and EnsembleID parameters. In the following example a new ensemble is being written. The time series trace number and model run date are both taken from the ensemble time series properties, which were read from the original file.



WriteReclamationHDB() Command Editor for Ensemble of Model Time Series

The command syntax is as follows:

WriteReclamationHDB (Parameter=Value, ...)

Command Parameters

Parameter	Description	Default
DataStore	The identifier for the ReclamationHDB data store to use	None – must be
	for the database.	specified.
TSList	Indicates the list of time series to be processed, one of:	AllTS
	• AllMatchingTSID – all time series that match the	
	TSID (single TSID or TSID with wildcards) will be	
	processed.	
	• AllTS – all time series before the command.	
	• EnsembleID – all time series in the ensemble will	
	be processed.	
	• FirstMatchingTSID – the first time series that	
	matches the TSID (single TSID or TSID with	
	wildcards) will be processed.	
	LastMatchingTSID – the last time series that	
	matches the TSID (single TSID or TSID with	
	wildcards) will be processed.	
	SelectedTS – the time series are those selected	
	with the SelectTimeSeries () command.	
TSID	The time series identifier or alias for the time series to be	Required if
	processed, using the * wildcard character to match	TSList=*TSID.
	multiple time series.	
EnsembleID	The identifier for the TSTool ensemble to be processed, if	Required if TSList=
	processing an ensemble, not to be confused with the	EnsembleID.
	Ensemble* parameters below that match HDB data.	
SiteDataTypeID	The site_datatype_id value to match the time	
	series. If specified, the value will be used instead of the	
	site_datatype_id determined from	
	SiteCommonName and DataTypeCommonName.	
Site	The site common name for the time series location; used	None – must be
CommonName	with the data type common name to determine the	specified unless
	site_datatype_id in the database. Because	SiteDataTypeID is
	SiteCommonName is not guaranteed to be unique, the	specified.
	SiteDataTypeID should be specified instead.	
DataType	The data type common name for the time series; used	None – must be
CommonName	with the site common name to determine the	specified unless
	site_datatype_id in the database. Because	SiteDataTypeID is
	DataTypeCommonName is not guaranteed to be unique	specified.
	without additional information such as HDB object type,	
	the SiteDataTypeID should be specified instead.	
	Use the following parameters when reading a single model time series.	
ModelName	The model name for the time series; used with the model	None – must be
	run name, hydrologic indicator(s), and model run date to	specified unless
	determine the model run id in the database.	ModelRunID is
		specified.
ModelRunName	The model run name for the time series; used with the	None – must be

Parameter	Description	Default
	model name, hydrologic indicator(s), and model run date to determine the model_run_id in the database.	specified unless ModelRunID is specified.
Hydrologic Indicator	The hydrologic indicator(s) to use for the time series; used with the model name, model run name, and model run date to determine the model_run_id in the database. The hydrologic indicate can be blank.	None – must be specified unless ModelRunID is specified.
ModelRunDate	The model run date (timestamp) to use for the time series; used with the model name, model run name, and hydrologic indicator(s) to determine the model_run_id in the database. The run date should be specified using the format YYYY-MM-DD hh:mm (zero-padded with hour 0-23, minute 0-59). Run dates in HDB include seconds, but this information is ignored when matching time series.	None – must be specified unless ModelRunID is specified.
NewModelRunDate	If specified, the new model run date will be used instead of the ModelRunDate.	Use ModelRunDate.
ModelRunID	The model_run_id value to match the time series. If specified, the value will be used instead of the model_run_id determined from ModelName, ModelRunName, HydrologicIndicator ModelRunDate (or NewModelRunDate).	
	Use the following parameters when writing an ensemble of model time series.	
EnsembleName	The name of the ensemble to write. The TSList=EnsembleID and EnsembleID parameters also should be specified.	Must be specified if writing an ensemble.
NewEnsembleName	If specified, the new ensemble name will be used instead of the EnsembleName.	EnsembleName
EnsembleModelName	The model name corresponding to the ensemble.	Must be specified if writing an ensemble.
EnsembleTrace	 Indicate how to identify time series trace identifiers: %z – use standard time series properties to format the ensemble trace ID (see command editor for format characters). %z indicates the sequence identifier from an ensemble trace time series. \${TS:property} – format the trace identifier from time series properties (e.g., properties read from original ensemble data) \${property} – format the trace identifier from time series processor (global) properties (e.g., properties set with the SetProperty () command) TSTool and the HDB GET_TSTOOL_ENSEMBLE_MRI procedure currently require the identifier to be an integer – additional options for identifying traces may be added in the future. 	The time series sequence number (equivalent to the %z formatting string)
EnsembleModel RunDate	When writing an ensemble, an existing model run date for the ensemble, specified using format:	

Parameter	Description	Default
	YYYY-MM-DD hh:mm (zero-padded with hour 0-23) The model time series associated with the existing run will be overwritten.	
NewEnsembleModel RunDate	 When writing an ensemble, the new model run date for the ensemble, specified using format: YYYY-MM-DD hh:mm (zero-padded with hour 0-23) \${ts:property} - use a run date from a time series property, truncated to minute \${property} - format the new model run date identifier from time series processor (global) properties (e.g., properties set with the SetProperty() command) 	If not specified, the ensemble identifier in HDB will not include the model run date.
	The following parameters are always appropriate.	
Agency	The agency abbreviation (e.g., USBR) for data records written to the database.	No agency is indicated in database.
Validation Flag	HDB validation flag. Only uppercase characters are supported.	No flag is used.
OverwriteFlag	HDB overwrite flag.	Overwrite (enforced by HDB stored procedure)
DataFlags	User-defined flags, up to 20 characters.	No flags are used.
TimeZone	Three-letter time zone abbreviation for the data records written to the database.	Default HDB time zone is assumed.
OutputStart	The date/time for the start of the output.	Use the global output period.
OutputEnd	The date/time for the end of the output.	Use the global output period.