/********************************************************************************/

NAME:       ATL_utilities
PURPOSE:    This package contains computational utilities necessary to load and
maintain the Norpac data set. Previous iterations of Norpac have
embedded these functions within GUI Modules and or triggers. As the
redevelopment of the Observer software continues. Those processes
are to be migrated here and called from the various modules which
require them. Excepted, are those validation functions or processes
which are unique to the module, table, or view.

Naming Conventions;
Parameters begin p_
Local Variables  v_
Global Variables g_

REVISIONS:
Ver        Date        Author              Description
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1.0        01/22/2007   Doug Turnbull      1. Created this package.

*******************************************************************************

Depth may be reported in Meters or fathoms the following paired functions do the
conversion and return a whole number (Rounded) value.
*******************************************************************************

FUNCTION Convert_Meters_To_Fathoms(p_Meters IN NUMBER) RETURN NUMBER;
FUNCTION Convert_Fathoms_To_Meters(p_Fathoms IN NUMBER) RETURN NUMBER;

*******************************************************************************

Latitude and Logitude have historically been reported to the precision of minutes.
Atlas now optionally permits seconds to be reported. If seconds are known then that
precision in the conversion to decimal degrees shall be maintained. If a NULL is
passed to the function then decimal degrees are returned with minutes precision.
The calling program must convert longitude reported to the west of the 180th meridian
as negative.
*******************************************************************************

FUNCTION Convert_Long_DMS_To_DD (p_degrees  IN NUMBER, p_minutes  IN NUMBER,
p_seconds  IN NUMBER, p_ew  IN VARCHAR2) RETURN NUMBER;
FUNCTION Convert_Lat_DMS_To_DD (p_degrees  IN NUMBER, p_minutes  IN NUMBER, p_seconds  IN NUMBER)
RETURN NUMBER;

*******************************************************************************

The following group of functions use the Oracle Spatial Cartridge to map latitude and
logitude positions to NMFS Reporting and Special areas. The code has been derived
from the sdo_columns_edit BIUR trigger on the edit haul table from the legacy system,
and from the position package. Both Created by Alison Vijgen.
*******************************************************************************

- 1 -
The conversion of longitude is required of values to the east of the 180th meridian. Observer reporting identifies these as 179 degrees East for example. The configuration within Oracle Spatial uses a 360 degree globe - 179 E must therefore be submitted as 181. The calling program must, as in the conversion to decimal degrees submit latitude to the east of the 180th meridian as a negative number.

FUNCTION Longitude_Converted(p_degrees IN VARCHAR2, p_minutes IN VARCHAR2, p_seconds IN VARCHAR2, p_ew IN VARCHAR2)
RETURN NUMBER;

FUNCTION Is_Coblz(p_latitude_degree IN NUMBER, p_latitude_minutes IN NUMBER, p_ew IN VARCHAR2, p_longitude_degree IN NUMBER, p_longitude_minutes IN NUMBER)
RETURN BOOLEAN;

FUNCTION Is_Coblz_YN(p_latitude_degree IN NUMBER, p_latitude_minutes IN NUMBER, p_ew IN VARCHAR2, p_longitude_degree IN NUMBER, p_longitude_minutes IN NUMBER)
RETURN VARCHAR2;

FUNCTION Get_RepAREA(p_latitude_degree IN NUMBER, p_latitude_minutes IN NUMBER, p_ew IN VARCHAR2, p_longitude_degree IN NUMBER, p_longitude_minutes IN NUMBER)
RETURN NUMBER;

FUNCTION Get_RetrievalSHAPE(p_latitude_degree IN NUMBER, p_latitude_minutes IN NUMBER, p_ew IN VARCHAR2, p_longitude_degree IN NUMBER, p_longitude_minutes IN NUMBER)
RETURN MDSYS.SDO_GEOMETRY;

FUNCTION Get_VesselCode(p_vessel_seq IN NUMBER)
RETURN VARCHAR2;

FUNCTION Get_HaulVesselCode(p_cruise IN NUMBER, p_haul_seq IN NUMBER)
RETURN VARCHAR2;

FUNCTION Get_Vessel_permit(p_vessel_seq IN NUMBER)
FUNCTION GET_PlantCode(p_plant_seq IN NUMBER)
    RETURN VARCHAR2;

FUNCTION Get_FishingStartDate (p_cruise IN NUMBER, p_trip_seq IN NUMBER)
    RETURN DATE;

FUNCTION Get_HaulDateOfEntry (p_cruise IN NUMBER, p_haul_seq IN NUMBER)
    RETURN DATE;

PROCEDURE Log_Load_Error(p_error_number IN NUMBER, p_cruise IN NUMBER,
                           p_table_name IN VARCHAR2, p_pk1_column_name IN VARCHAR2,
                           p_pk1_column_value IN VARCHAR2, p_pk2_column_name IN VARCHAR2,
                           p_pk2_column_value IN VARCHAR2, p_load_level IN VARCHAR2,
                           p_comments IN VARCHAR2);

NAME: get_cruise
PURPOSE: Triggers populate the Record_Set_Status and Record_Status tables. Since on the AFSC end sequence generated PK values submitted by the deployed version of ATLAS may not be unique outside the context of an observer cruise, the cruise must also be supplied with the dataset. This function determines and return the cruise for transaction tables that are not part of an arc.

REVISIONS:
Ver Date Author Description
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1.0 02/20/2007 Doug Turnbull 1. Initial Creation
03/03/2007 Doug Turnbull 2. Completed debugging
03/03/2007 Doug Turnbull 3. Completed initial unit testing
05/21/2007 Doug Turnbull 4. Debugged Fish_Inv_Specimen length pathway
NOTES: This function when Passed the Current Table name, and the Parent primary key values
by the calling trigger, walks up the FK thread to identify the observer cruise which
is the return value. For the set of transaction tables foreign keys cascade. Since this
precludes quering the parent table(s) which are in an indeterminate stat a mutating table
error ORA-04091 must be trapped. To allow handling this error the PK value of the current
table is also passed to this function P_VALUE3. The record status can then be directly set
to D (delete). If no data is found when trapping the error, nothing is recorded as the
on delete cascade FK function will flow through the system on the NOPAC data set as well
obviating the need to log this in the record status. The function returns NULL in this case.
Alternatively this feature could be exploited to simplify the passed values to AFSC in the
record status table, deleteing from the passed set of data those records affected by the
cascade delete FK. Something to think about for the next release.

******************************************************************************/
FUNCTION GET_CRUISE (P_TABLE IN VARCHAR2, P_VALUE1 IN NUMBER, P_VALUE2 IN NUMBER, P_VALUE3 IN NUMBER )
RETURN ATL_OBSERVER_CRUISE.CRUISE%TYPE;

****************************************************************************** Extrapolate_Fixed_Species ****************************************************
This procedure when passed a cruise, haul, species combination returns the extrapolated weight
and count for a longline or pot operation for that species, for that haul. Note that the values
are accumulated for a species and sample by haul.

Rules:
Required for a Sample:
  combined_flag default = 'N'
  presorted_flag default = 'N'
  sample_hooks_pots required on parent samples, ignored on sub samples
Required for a Species Comp:
  species_number required on parent samples, ignored on sub samples,
  Parent samples determine the total sampled hooks, and total numbers of a species.
  Subsamples determind the aggregated average weight of a species for a haul/trip/cruise
  The subsample will not have a total number of hooks. The species
  composition weights and numbers are required. The computed average weight of
  a species within the subsample is applied compute those missing values.
  If the species composition set is still missing values then
  the average weight for that species is aggregated from other hauls on the
  current trip.
  If the species composition set is still missing values then
  the average weight for that species is aggregated from other hauls on the
  current cruise.
  If the species composition set is still missing values then
  have a beer and think about it some more.
*********************************************************************************
NAME: is_specimen_num_unique
PURPOSE: When passed The PK value from the parent length, the specimen type,
and the desired specimen number verify uniqueness of the specimen
number within a cruise/permit, species, and specimen type.
FUNCTION IS_SPECIMEN_NUM_UNIQUE
(P_LENGTH_SEQ IN atl_fish_inv_specimen.length_seq%TYPE,
P_SPECIMEN_TYPE IN atl_fish_inv_specimen.specimen_type%TYPE,
P_SPECIMEN_NUMBER IN atl_fish_inv_specimen.specimen_number%TYPE,
P_SPECIES_CODE IN NUMBER)
)
RETURN NUMBER;

PROCEDURE CLEAR_PERCENT RETAINED
(P_SPECIES_CODE IN atl_species_composition.species_code%TYPE,
P_SAMPLE_SEQ IN atl_sample.sample_seq%TYPE);

NAME: get_samples_haul_offload
PURPOSE: When passed The sample_seq get its haul/offload ancestor

REVISIONS:
Ver Date Author Description
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1.0 12/11/2007 Ed Dunn 1. Created this procedure.
NOTES:

******************************************************************************
FUNCTION COMPUTE PROCESSOR CODE
   This utility is provided for the current_haul_mv materialized view.
   When passed a cruise and haul_seq, it looks up the vessel/plant permit,
   pads the value to five places and appends an initial value depending
   on vessel type:
   'P' for catcher processor (vessel type 1)
   'M' for mothership (vessel types 2 and 4)
   'F' for shoreside plants or floating processors
******************************************************************************

FUNCTION compute_processor_code
   (p_cruise  IN  atl_haul.cruise%TYPE,
    p_haul_seq IN  atl_haul.haul_seq%TYPE)
RETURN VARCHAR2;

******************************************************************************
FUNCTION GET PLANT PERMIT
   This utility supports the current_haul_mv materialized view.
   When passed a plant_seq, it returns the federal permit number
   of the processing plant associated with the plant sequence number.
******************************************************************************

FUNCTION get_plant_permit
   (p_plant_seq  IN  NUMBER)
RETURN VARCHAR2;

******************************************************************************
FUNCTION COMPUTE SAMPLE NUMBER
   This utility sums the sample numbers (counts) for a species for a haul.
   Its purpose is to support the current_spcomp_mv for the Region.
   For completeness, species apportioned back to a haul from an offload
   are included.
******************************************************************************

FUNCTION compute_sample_number
   (p_cruise      IN  atl_haul.cruise%TYPE,
    p_haul_seq    IN  atl_haul.haul_seq%TYPE,
    p_species_code IN  atl_species_composition.species_code%TYPE,
    p_sex_code    IN  atl_species_composition.sex_code%TYPE)
RETURN NUMBER;

******************************************************************************
FUNCTION COMPUTE TOTAL SAMPLE SIZE
This utility sums all sample weights for a haul. Its purpose is to support the current_spcomp_mv for the Region.

FUNCTION compute_total_sample_size

RETURN NUMBER;

FUNCTION compute_sample_weight

RETURN NUMBER;

FUNCTION compute_trawl_otc

RETURN NUMBER;

FUNCTION compute_sample_sze

RETURN NUMBER;

FUNCTION get_cg_number

This utility has two flavors to support the PACFIN CURRENT HAUL VIEW, when passed the domestic/inseason vessels from old norpac it looks up the CG number from vessplnt. When passes the vessel_seq from the ATL tables, it looks up the CG number from the ATL_lov_vessel table.
FUNCTION get_cg_number
(p_table   IN   VARCHAR2,
p_vessel   IN   VARCHAR2)

RETURN VARCHAR2;

END ATL_utilities;
/

FUNCTION extrap_fixed_species_wt
(p_cruise IN NUMBER, p_haul IN NUMBER,
p_species IN NUMBER, p_sex_code IN VARCHAR2)

RETURN NUMBER;

FUNCTION extrap_fixed_species_ct
(p_cruise IN NUMBER, p_haul IN NUMBER,
p_species IN NUMBER, p_sex_code IN VARCHAR2)

RETURN NUMBER;

FUNCTION compute_fixed_OTC
(p_cruise IN NUMBER, p_haul IN NUMBER)

RETURN NUMBER;

/**********************************************************************************************

The extrapolation algorithms for species weight and count are required to maintain the current
views for AKR fishery management. The values are presented in the view ATL_CURRENT_SPCOMP.
The following functions call the private procedures which compute and return the expanded
weights and numbers. These public functions provide the vehicle for display by the view.
**********************************************************************************************/

/** g_atlas_version NUMBER := 8.0; */

/** NAME:    ATL_LOAD_NORPAC
  PURPOSE: This Package Contains the ATL_table load and Current View Presentation Processes
  from the Atlas 2008 Application to the legacy Norpac data set. Note that some
  of the detail from Observer Data collected and transmitted from deployed
  versions of ATLAS is lost in the current view presentation layer. */

REVISIONS:

Ver Date Author Description
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1.0 12/26/2006 Doug Turnbull 1. Created this package body as a development stub.
3/20/2007 Doug Turnbull 2. Added Private Function verify_cruise_exists

**********************************************************************************************

Samples are not of a specific type in the Atl table structure. To support that notion
the structure of the sample/subsample must be examined and the results interpreted.
This function does the analysis and return the sample type code expected by Domestic or Inseason

```
FUNCTION compute_sample_type(p_cruise IN NUMBER, p_haul_seq IN NUMBER)
    RETURN VARCHAR2;
```

This function returns the haul_number when passed the haul_seq

```
FUNCTION get_haul_number(p_cruise IN NUMBER, p_haul_seq IN NUMBER)
    RETURN NUMBER;
```

This function returns the number of distinct species in a sample (sample_number)

```
FUNCTION compute_number_of_species(p_cruise IN NUMBER, p_species_code IN VARCHAR2,
    p_sample_seq IN NUMBER, p_haul_seq IN NUMBER)
    RETURN NUMBER;
```

This function returns the percentage of a species retained for a haul

```
FUNCTION get_percent_retained(p_cruise IN NUMBER, p_haul_seq IN NUMBER,
    p_species_code IN NUMBER)
    RETURN NUMBER;
```

This procedure creates a cursor for all records in the ATL Record Status table. This acts as a template to move records from the working tables into the Atlas production table set.

```
PROCEDURE load_atl_tables(p_return_code OUT NUMBER);
```

This function returns the load/edit date for a species composition record logged in the atl_record_status table. This is analogous to the date of entry for domestic and inseason

```
FUNCTION get_record_status_date(p_cruise IN NUMBER, p_table_name IN VARCHAR2,
    p_pk1_column_name IN VARCHAR2, p_pk1_value IN VARCHAR2,
    p_pk2_column_name IN VARCHAR2, p_pk2_value IN VARCHAR2)
    RETURN DATE;
```

This procedure updates the Record_Status when called by the AIUDR trigger that also creates the histories. It sets the status_code, editor, and modified date as appropriately depending on what action has been performed on the parent record. This provides the inseason advisor with last touch information - which could alternatively be derived from a query of the history
table. The functionality is for the convenience of the user and is a recognized
denormalization.

***********************************************************************************************/

PROCEDURE set_record_edit_status(p_cruise IN NUMBER, p_table_name IN VARCHAR2,
   p_pk1_column_name IN VARCHAR2, p_pk1_value IN VARCHAR2,
   p_pk2_column_name IN VARCHAR2, p_pk2_value IN VARCHAR2,
   p_edit_date IN DATE, p_editor IN VARCHAR2, p_status_code IN VARCHAR2);

PROCEDURE set_record_edit_status(p_cruise IN NUMBER, p_table_name IN VARCHAR2,
   p_pk_value IN VARCHAR2);

PROCEDURE set_record_edit_status(p_mode IN VARCHAR2,
   p_cruise IN NUMBER, p_table_name IN VARCHAR2,
   p_pk1_column_name IN VARCHAR2, p_pk1_value IN VARCHAR2,
   p_pk2_column_name IN VARCHAR2, p_pk2_value IN VARCHAR2,
   p_edit_date IN DATE, p_editor IN VARCHAR2, p_status_code IN VARCHAR2);

FUNCTION is_specimen_num_unique(p_length_seq IN atl_fish_inv_specimen.length_seq%TYPE
   ,p_specimen_type IN atl_fish_inv_specimen.specimen_type%TYPE
   ,p_species_code IN NUMBER)
   RETURN BOOLEAN;

END ATL_Load_norpac;
/