Standards Change Request

Assign keywords to IMAGE_MAP_PROJECTION object   SCR3-1138.v2

Provenance:

Date: 2008-05-21
Author(s): Susie Slavney (Geosciences) and Elizabeth Rye (EN)
Working Group: Susie Slavney (Geosciences) (lead), Chris Isbell (Imaging),
              Michael Cayanan (Technical Advisor), Steve Adams (PDS EN DE)

Date: 2008-05-12
Author(s): Susie Slavney (Geosciences)
Working Group: Susie Slavney (Geosciences) (lead), Chris Isbell (Imaging),
              Michael Cayanan (Technical Advisor), Steve Adams (PDS EN DE)
Title: Assign keywords to IMAGE_MAP_PROJECTION object (scr3-1138.v1)

Problem:

Seven keywords in the PDS data dictionary were apparently intended to be
optional keywords for the IMAGE_MAP_PROJECTION object, but were never
listed in the object definition in the PSDD. Currently these keywords
belong to no object. These keywords are needed for Mini-RF archives on
LRO and Chandrayaan-1.

The keywords are:

KEYWORD_LATITUDE_TYPE
OBLIQUE_PROJ_POLE_LATITUDE
OBLIQUE_PROJ_POLE_LONGITUDE
OBLIQUE_PROJ_POLE_ROTATION
OBLIQUE_PROJ_X_AXIS_VECTOR
OBLIQUE_PROJ_Y_AXIS_VECTOR
OBLIQUE_PROJ_Z_AXIS_VECTOR

Current Urgency:

The keywords are used in labels planned for Mini-RF data products for the LRO
and Chandrayaan-1 missions. The LRO launch date is currently 10/30/08.
The Chandrayaan-1 launch is uncertain but may occur this summer.

Proposed Solution:

The keywords should be added to the optional element set in the Data
Dictionary definition of the IMAGE_MAP_PROJECTION object.

C. Isbell would also like to take the opportunity to improve the description.
The changes are as follows:

The IMAGE_MAP_PROJECTION object is one of two distinct
objects that define the map projection used in creating ~~the~~
cartographically registered digital images in a PDS data set.
The ~~name the of~~ other associated object that completes the
definition is called DATA_SET_MAP_PROJECTION. The map
projection information resides in these two objects~~,~~
~~essentially~~ to reduce ~~data~~ redundancy and at the same
time to allow the inclusion of elements needed to process

the data at the image level. Basically, static information
that is applicable to the complete data set resides in the
DATA_SET_MAP_PROJECTION object, while dynamic information
that is applicable to the individual images resides in the
IMAGE_MAP_PROJECTION object. The line_first_pixel,
line_last_pixel, sample_first_pixel, and sample_last_pixel
keywords are used to indicate ~~which way is up~~ spatial
orientation of a stored ~~in an~~ image. ~~Sometimes a~~An image
~~can be~~ may have been shifted or flipped prior to ~~it~~ being
physically recorded. These keywords give the mapping of
pixels between the original image and the stored image.
The IMAGE_MAP_PROJECTION object is to be included in a
~~Archive Quality D~~data ~~P~~product ~~L~~label, and used to load the
map projection catalog data into a PDS Catalog.
Note: For pre-V3.1 PDS Standards the default coordinate
system was Planetographic.

Impact Assessment:

PDS Standards Reference: Updates to Appendix B.14; details shown below.
Archive Preparation Guide: No impact.
Proposer's Archive Guide: No impact.
Planetary Science Data Dictionary: Change to IMAGE_MAP_PROJECTION object
definition.
PDS Tools: No impact.
Effect on existing archives: Positive impact, if any. Any existing labels
that
use these keywords would be able to be correctly validated.
New development required: None.

Additional Information:

None.

Requested Changes:

Update the first three paragraphs of Appendix B.14 of the Standards Reference
as follows:

The IMAGE_MAP_PROJECTION object is one of two distinct objects that define the map
projection used in creating ~~the cartographically registered~~ digital images in a PDS data set.
The ~~name of the~~ other associated
object that completes the definition is DATA_SET_MAP_PROJECTION (see Appendix B.8).

The map projection information resides in these two objects~~, essentially~~ to reduce ~~data~~
redundancy and at the same time to allow the inclusion of elements needed to process the data at
the image level. Basically, static information that is applicable to the complete data set resides in
the DATA_SET_MAP_PROJECTION object, while dynamic information that is applicable to
the individual images resides in the IMAGE_MAP_PROJECTION object.

The LINE_FIRST_PIXEL, LINE_LAST_PIXEL, SAMPLE_FIRST_PIXEL, and SAMPLE_LAST_PIXEL
keywords are used to indicate ~~which way is up~~ spatial orientation of a stored ~~in an~~ image.
~~Sometimes a~~An image ~~can be~~ may have been shifted or flipped prior to ~~its~~ being physically recorded. These
keywords are used in calculating the mapping of pixels between the original image and the
stored image.

Update section B.14.3 of the Standards Reference as follows:

1. DATA_SET_ID
2. IMAGE_ID
3. HORIZONTAL_FRAMELET_OFFSET
4. VERTICAL_FRAMELET_OFFSET

An updated definition for IMAGE_MAP_PROJECTION is below.

```
PDS_VERSION_ID                    = PDS3

OBJECT                            = OBJECT_DEFINITION
  NAME                            = "image_map_projection"
  TERSE_NAME                      = "imagemapproj"
  STATUS_TYPE                     = "APPROVED"
  SOURCE_NAME                     = "MAGELLAN"
  OBJECT_TYPE                     = "GENERIC"
  OBJECT_CLASSIFICATION_TYPE      = "PRODUCT CATALOG"
  DESCRIPTION                     = "

The IMAGE_MAP_PROJECTION object is one of two distinct
objects that define the map projection used in creating
cartographically registered digital images in a PDS data
set.  The other associated object that completes the
definition is called DATA_SET_MAP_PROJECTION.  The map
projection information resides in these two objects
to reduce redundancy and at the same time to
allow the inclusion of elements needed to process the data
at the image level. Basically, static information that is
applicable to the complete data set resides in the
DATA_SET_MAP_PROJECTION object, while dynamic information
that is applicable to the individual images resides in the
IMAGE_MAP_PROJECTION object.  The line_first_pixel,
line_last_pixel, sample_first_pixel, and sample_last_pixel
keywords are used to indicate spatial orientation of a stored
image.  An image may have been shifted or flipped prior to
being physically recorded.  These keywords give the
mapping of pixels between the original image and the stored
image. The IMAGE_MAP_PROJECTION object is to be included
in a data product label, and used to load the
map projection catalog data into a PDS Catalog.
Note:  For pre-V3.1 PDS Standards the default coordinate
system was Planetographic."

  OBJECT                            = OBJECT_HIER
    SUBOBJECT_NAME                  = "data_set_map_projection"
    REQUIRED_FLAG                   = "Y"
  END_OBJECT                        = OBJECT_HIER

  OBJECT                            = OBJECT_ELEMENT
    ELEMENT_NAME                    = "a_axis_radius"
    REQUIRED_FLAG                   = "Y"
  END_OBJECT                        = OBJECT_ELEMENT

  OBJECT                            = OBJECT_ELEMENT
    ELEMENT_NAME                    = "b_axis_radius"
    REQUIRED_FLAG                   = "Y"
  END_OBJECT                        = OBJECT_ELEMENT

  OBJECT                            = OBJECT_ELEMENT
    ELEMENT_NAME                    = "c_axis_radius"
```

```
   REQUIRED_FLAG                       = "Y"
END_OBJECT                             = OBJECT_ELEMENT

OBJECT                                 = OBJECT_ELEMENT
  ELEMENT_NAME                         = "center_latitude"
  REQUIRED_FLAG                        = "Y"
END_OBJECT                             = OBJECT_ELEMENT

OBJECT                                 = OBJECT_ELEMENT
  ELEMENT_NAME                         = "center_longitude"
  REQUIRED_FLAG                        = "Y"
END_OBJECT                             = OBJECT_ELEMENT

OBJECT                                 = OBJECT_ELEMENT
  ELEMENT_NAME                         = "coordinate_system_name"
  REQUIRED_FLAG                        = "Y"
END_OBJECT                             = OBJECT_ELEMENT

OBJECT                                 = OBJECT_ELEMENT
  ELEMENT_NAME                         = "coordinate_system_type"
  REQUIRED_FLAG                        = "Y"
END_OBJECT                             = OBJECT_ELEMENT

OBJECT                                 = OBJECT_ELEMENT
  ELEMENT_NAME                         = "easternmost_longitude"
  REQUIRED_FLAG                        = "Y"
END_OBJECT                             = OBJECT_ELEMENT

OBJECT                                 = OBJECT_ELEMENT
  ELEMENT_NAME                         = "line_first_pixel"
  REQUIRED_FLAG                        = "Y"
END_OBJECT                             = OBJECT_ELEMENT

OBJECT                                 = OBJECT_ELEMENT
  ELEMENT_NAME                         = "line_last_pixel"
  REQUIRED_FLAG                        = "Y"
END_OBJECT                             = OBJECT_ELEMENT

OBJECT                                 = OBJECT_ELEMENT
  ELEMENT_NAME                         = "line_projection_offset"
  REQUIRED_FLAG                        = "Y"
END_OBJECT                             = OBJECT_ELEMENT

OBJECT                                 = OBJECT_ELEMENT
  ELEMENT_NAME                         = "map_projection_rotation"
  REQUIRED_FLAG                        = "Y"
END_OBJECT                             = OBJECT_ELEMENT

OBJECT                                 = OBJECT_ELEMENT
  ELEMENT_NAME                         = "map_projection_type"
  REQUIRED_FLAG                        = "Y"
END_OBJECT                             = OBJECT_ELEMENT

OBJECT                                 = OBJECT_ELEMENT
  ELEMENT_NAME                         = "map_resolution"
  REQUIRED_FLAG                        = "Y"
END_OBJECT                             = OBJECT_ELEMENT

OBJECT                                 = OBJECT_ELEMENT
  ELEMENT_NAME                         = "map_scale"
  REQUIRED_FLAG                        = "Y"
END_OBJECT                             = OBJECT_ELEMENT
```

```
OBJECT                          = OBJECT_ELEMENT
  ELEMENT_NAME                  = "maximum_latitude"
  REQUIRED_FLAG                 = "Y"
END_OBJECT                      = OBJECT_ELEMENT

OBJECT                          = OBJECT_ELEMENT
  ELEMENT_NAME                  = "minimum_latitude"
  REQUIRED_FLAG                 = "Y"
END_OBJECT                      = OBJECT_ELEMENT

OBJECT                          = OBJECT_ELEMENT
  ELEMENT_NAME                  = "positive_longitude_direction"
  REQUIRED_FLAG                 = "Y"
END_OBJECT                      = OBJECT_ELEMENT

OBJECT                          = OBJECT_ELEMENT
  ELEMENT_NAME                  = "sample_first_pixel"
  REQUIRED_FLAG                 = "Y"
END_OBJECT                      = OBJECT_ELEMENT

OBJECT                          = OBJECT_ELEMENT
  ELEMENT_NAME                  = "sample_last_pixel"
  REQUIRED_FLAG                 = "Y"
END_OBJECT                      = OBJECT_ELEMENT

OBJECT                          = OBJECT_ELEMENT
  ELEMENT_NAME                  = "sample_projection_offset"
  REQUIRED_FLAG                 = "Y"
END_OBJECT                      = OBJECT_ELEMENT

OBJECT                          = OBJECT_ELEMENT
  ELEMENT_NAME                  = "westernmost_longitude"
  REQUIRED_FLAG                 = "Y"
END_OBJECT                      = OBJECT_ELEMENT

OBJECT                          = OBJECT_ELEMENT
  ELEMENT_NAME                  = "data_set_id"
  REQUIRED_FLAG                 = "N"
END_OBJECT                      = OBJECT_ELEMENT

OBJECT                          = OBJECT_ELEMENT
  ELEMENT_NAME                  = "first_standard_parallel"
  REQUIRED_FLAG                 = "N"
END_OBJECT                      = OBJECT_ELEMENT

OBJECT                          = OBJECT_ELEMENT
  ELEMENT_NAME                  = "horizontal_framelet_offset"
  REQUIRED_FLAG                 = "N"
END_OBJECT                      = OBJECT_ELEMENT

OBJECT                          = OBJECT_ELEMENT
  ELEMENT_NAME                  = "image_id"
  REQUIRED_FLAG                 = "N"
END_OBJECT                      = OBJECT_ELEMENT

OBJECT                          = OBJECT_ELEMENT
  ELEMENT_NAME                  = "keyword_latitude_type"
  REQUIRED_FLAG                 = "N"
END_OBJECT                      = OBJECT_ELEMENT

OBJECT                          = OBJECT_ELEMENT
```

```
   ELEMENT_NAME                = "oblique_proj_pole_latitude"
   REQUIRED_FLAG               = "N"
 END_OBJECT                    = OBJECT_ELEMENT

 OBJECT                        = OBJECT_ELEMENT
   ELEMENT_NAME                = "oblique_proj_pole_longitude"
   REQUIRED_FLAG               = "N"
 END_OBJECT                    = OBJECT_ELEMENT

 OBJECT                        = OBJECT_ELEMENT
   ELEMENT_NAME                = "oblique_proj_pole_rotation"
   REQUIRED_FLAG               = "N"
 END_OBJECT                    = OBJECT_ELEMENT

 OBJECT                        = OBJECT_ELEMENT
   ELEMENT_NAME                = "oblique_proj_x_axis_vector"
   REQUIRED_FLAG               = "N"
 END_OBJECT                    = OBJECT_ELEMENT

 OBJECT                        = OBJECT_ELEMENT
   ELEMENT_NAME                = "oblique_proj_y_axis_vector"
   REQUIRED_FLAG               = "N"
 END_OBJECT                    = OBJECT_ELEMENT

 OBJECT                        = OBJECT_ELEMENT
   ELEMENT_NAME                = "oblique_proj_z_axis_vector"
   REQUIRED_FLAG               = "N"
 END_OBJECT                    = OBJECT_ELEMENT

 OBJECT                        = OBJECT_ELEMENT
   ELEMENT_NAME                = "reference_latitude"
   REQUIRED_FLAG               = "N"
 END_OBJECT                    = OBJECT_ELEMENT

 OBJECT                        = OBJECT_ELEMENT
   ELEMENT_NAME                = "reference_longitude"
   REQUIRED_FLAG               = "N"
 END_OBJECT                    = OBJECT_ELEMENT

 OBJECT                        = OBJECT_ELEMENT
   ELEMENT_NAME                = "second_standard_parallel"
   REQUIRED_FLAG               = "N"
 END_OBJECT                    = OBJECT_ELEMENT

 OBJECT                        = OBJECT_ELEMENT
   ELEMENT_NAME                = "vertical_framelet_offset"
   REQUIRED_FLAG               = "N"
 END_OBJECT                    = OBJECT_ELEMENT

 OBJECT                        = OBJECT_ALIAS
   ALIAS_NAME                  = "image_map_projection_catalog"
   USAGE_NOTE                  = ""
 END_OBJECT                    = OBJECT_ALIAS

 STATUS_NOTE                   = "

 1.0 6/20/90 G.M.WOODWARD  Define the Image Map Projection
Object.
1.1 3/14/91 G.M.WOODWARD  Changed reference to PDS
Central Node catalog for loading map projection.
1.2 6/29/92 G.M.WOODWARD  Object hierarchy fixes,
name changes, and modified descriptions.
```

```
1.3 7/14/92 G.M.WOODWARD  Added usage note to
description for line/sample first/last pixel keywords.
1.4  10-10-95  K.E. Law   Added a note to the object description to note
the pre-V3.1 Standards default.  Updated the required and optional
keyword lists to comply with the PDS Cartographic Standards.
1.5 05/21/08 S. Slavney  Added optional keywords keyword_latitude_type,
oblique_proj_pole_latitude/longitude/rotation, and oblique_proj_x/y/
z_axis_vector.  C. Isbell.  Updated description."

END_OBJECT                          = OBJECT_DEFINITION
END
```