Iunctus Geomatics Corp.
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Shifting SPOT scenes

Introduction

SPOT satellites acquire imagery in segments. A segment is made up of one or more scenes. The extent of these images is pre-defined along a grid that SPOT calls the KJ grid.

SPOT satellites are programmed to acquire certain areas. In order to acquire those areas, the sensors are switched on before the area, and are switched off after the area has been flown. The switching on and off of the sensors does not line up with the pre-defined areas of a SPOT image. Therefore, the segment almost always starts with an “incomplete” scene, and almost always ends with an “incomplete” scene. Incomplete means that the scene does not have data either at the beginning of the scene, or at the end of the scene.

SPOT does not deliver incomplete scenes, as it contains black lines which will confuse COTS software. In order for a scene to be complete, it has to be shifted at least so much to avoid the black lines.

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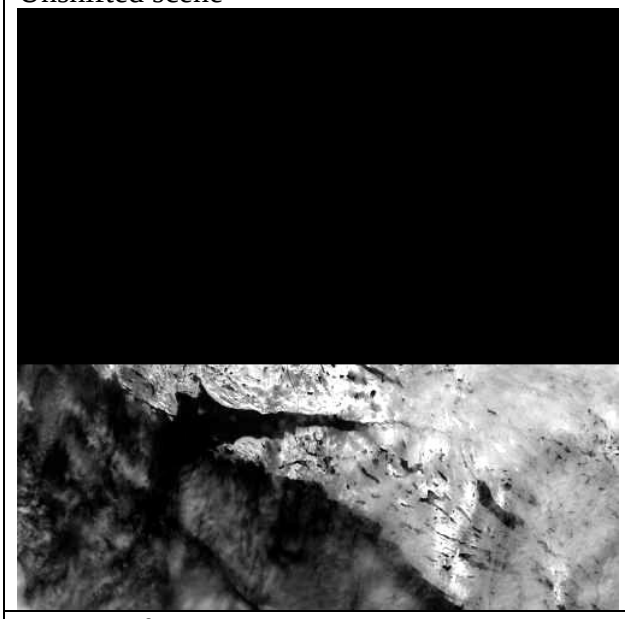
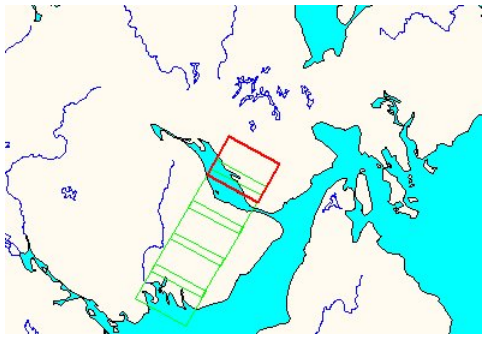
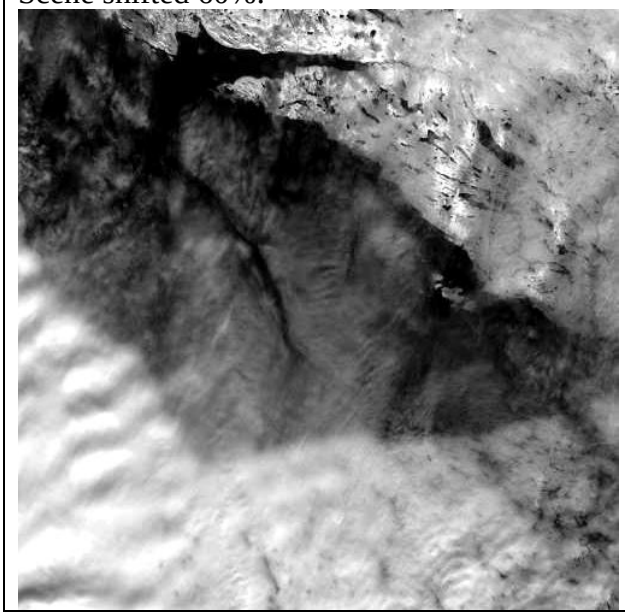
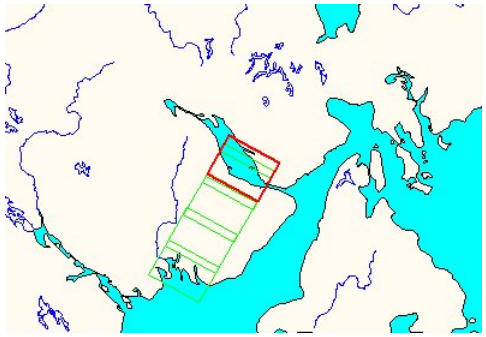
Shifting at the beginning of a segment

SPOT scenes can only be shifted down in its' segment, in increments of 10%. This is obvious for incomplete scenes at the beginning of a segment. Those scenes have black lines in the beginning of the scene, and need to be shifted down along the segment. The minimum that the scene needs to shifted down is called the "minimum shift".
Example: scene 256921405091917060 42P. This scene is in the beginning of a segment, and needs to be shifted down by at least 60%, or a shift of 6:

Unshifted scene 	Location of the unshifted scene, sceneID 256921405091917060 42P 
Scene shifted 60%: 	Location of the shifted scene, sceneID 256921405091917060 42P6 

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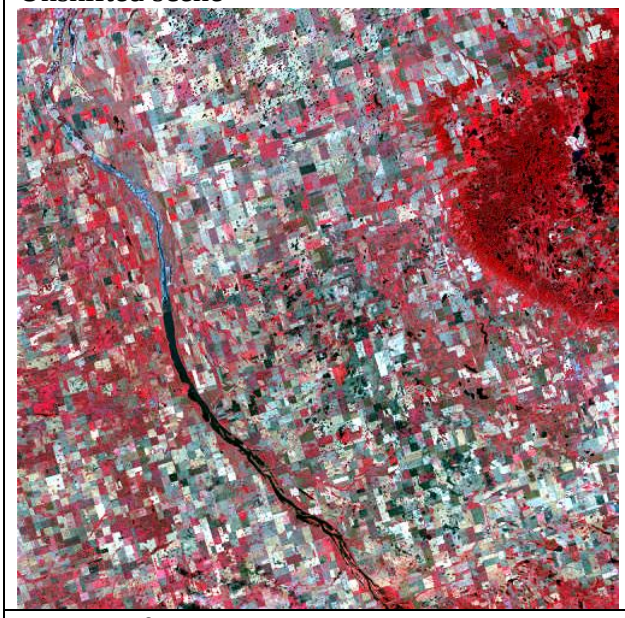
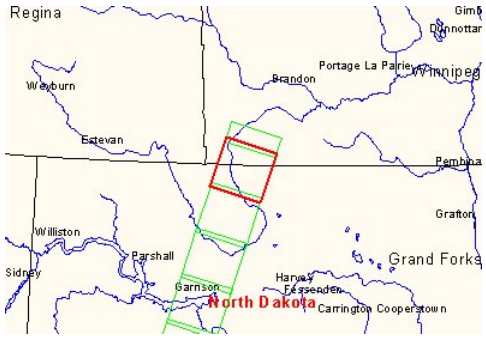
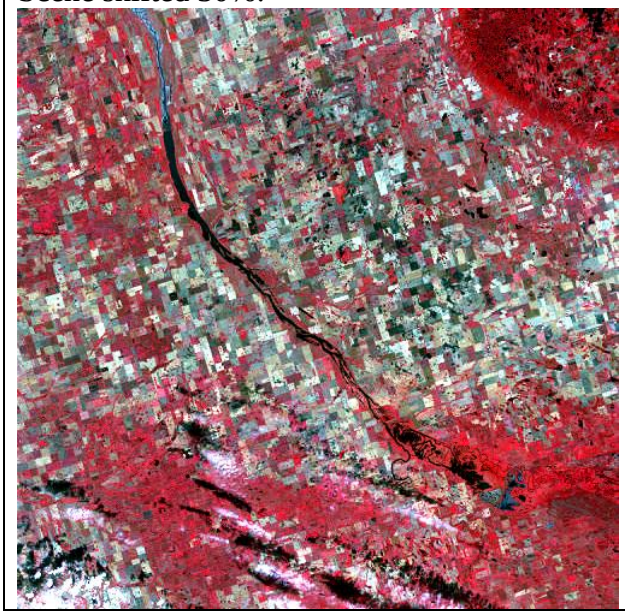
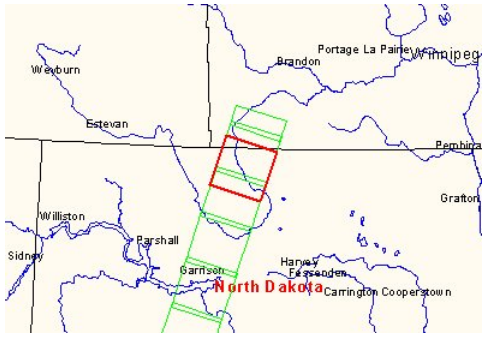
Shifting in the middle of a segment.

Scenes in the middle of a segment do not have to be shifted, but in order to optimize coverage of a certain area with the minimum possible number of scenes, it could be advantageous to do so.
Example: scene 55662510509191755582J. This scene is in the middle of a segment, and can be shifted up to 90% down. Shifting 100% down would in effect give you the next scene on the KJ grid, so that is never possible. Below, the scene will be shifted 30%.

Unshifted scene 	Location of the unshifted scene, sceneID 556625105091917555582J 
Scene shifted 30%: 	Location of the shifted scene, sceneID 556625105091917555582J3 

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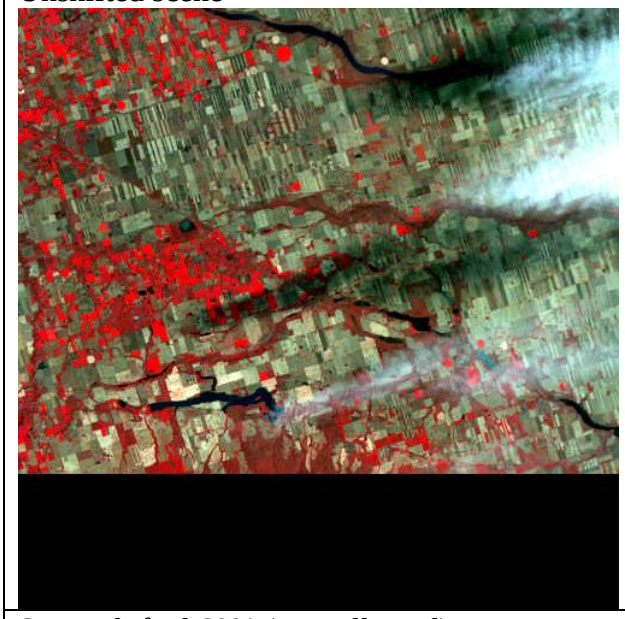
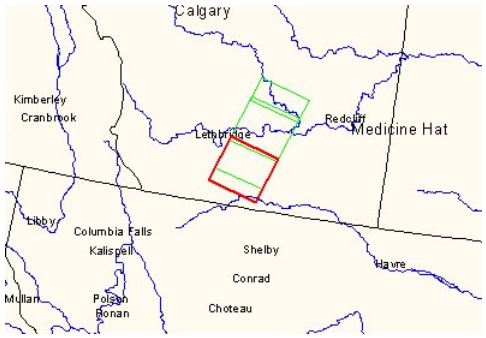
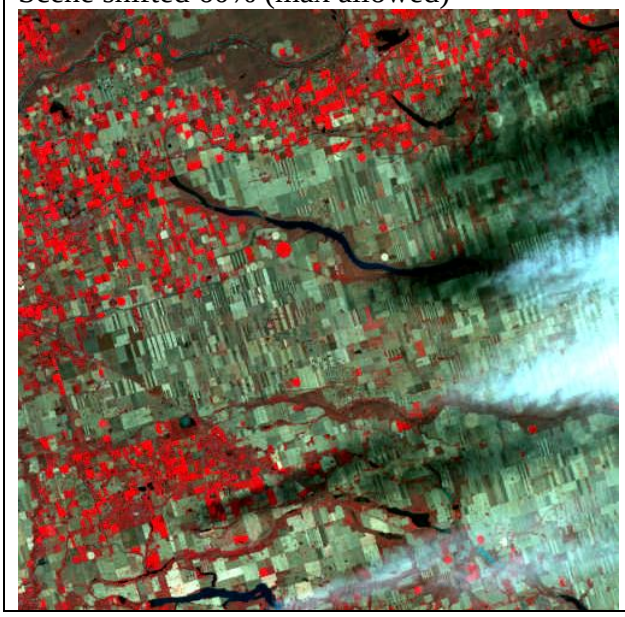
Shifting at the end of a segment.

Scenes at the end of a segment need to be shifted up. Technically, this is not possible, as the shift always indicates a shift down on the segment. Shifting a scene up can be done however, by taking the previous scene on the segment, and shifting that one down.

Unshifted scene 	Location of the unshifted scene, sceneID 254225005091918515 51X 
Scene shifted 60% (max allowed) 	Location of the previous scene, shifted down 60%, sceneID 254224905091918514 71X6 

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Parameters “min shift” and “max shift”

Min shift:

The minimum shift indicates the minimum amount that a scenes, in the beginning of a segment needs to be shifted down in order for it to be a complete (i.e. no black) scene. If min shift equals 0, then this indicates that the scene is complete already, so shifting is not obligatory.
The min shift on a scene in the beginning of a segment should always be higher than 0, and up to 9.

The min shift on a scene in a middle of a segment is always 0.

The min shift on a scene at the end of a segment is always *. A * means that that scene cannot be produced, and should be shifted up in order for it to be a complete scene.

Max shift

The maximum shift indicates the maximum a scene can be shifted down, and still be a complete scene.

The maximum shift on a scene in the beginning of a segment should always be at least one.

The maximum shift on a scene in the middle of a segment could be any from 1 to 9, depending on the completeness of the next scene in the segment.

The maximum shift on a scene at the end of a segment is always *. A * means that that scene cannot be produced, and should be shifted up in order for it to be a complete scene.