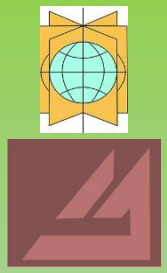

JSC URALMARKSHEYDERIYA
(AC JSC ROSCARTOGRAPHY)

Обработка данных АФС на PHOTOMOD для создания топопланов м-ба 1:2000

The use of PHOTOMOD in the process of topographic plans 1:2 000 production

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The strategy of task

Providinig urbanized territories with imagery data and to produce on its base digital topographic materials 1:2 000

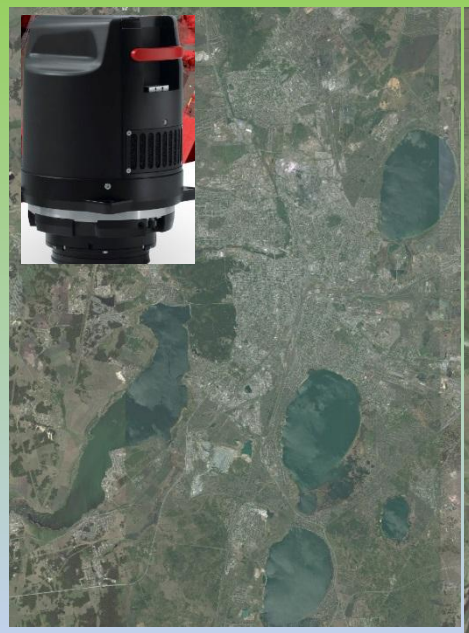
Territiories (2017-2018):

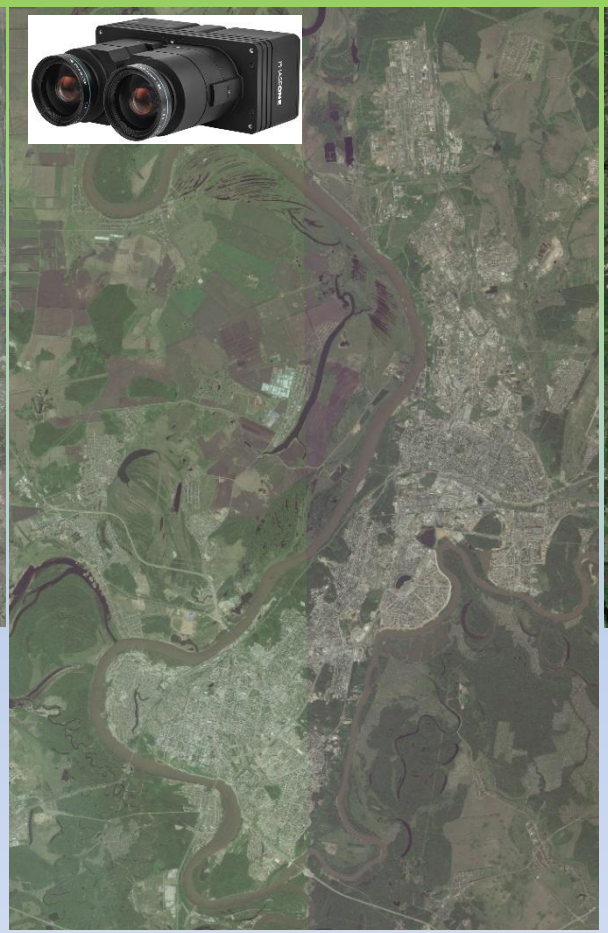
Novosibirsk, Ekaterinburg, Nizhni Novgorod, Chelyabinsk, Omsk, Ufa, Rostov-on-Don, Perm, Volgograd

Orthofotoplan
Matrix
(SCS 2011, Regional LSC)
1:2 000

Digital topographic plans 1:2 000
Digital navigation maps 1:2 000
(SCS 2011)

The territories of Uralmarksheyderiya





Chelyabinsk
(Population: 1,200 th
Area: 500 sq.km)
Aerial camera:
Leica RCD30 Penta

Ufa
(Population: 1,090 th
Area: 700 sq.km)
Aerial camera:
Phase One iXU-RS-1900

Nizhi Novgorod
(Population: 1,250 th
Area: 600 sq.km)
Aerial camera:
Vexcel UltraCam

Initial data

Process	Chelyabinsk	Nizhni Novgorod	Ufa
Aerial surveying	-	-	-
Geodesy for aerial surveying	-	-	*
Geodesy for referencing	*	*	*
Photogrammetry	*	*	*
Digital topographic maps	*	-	*

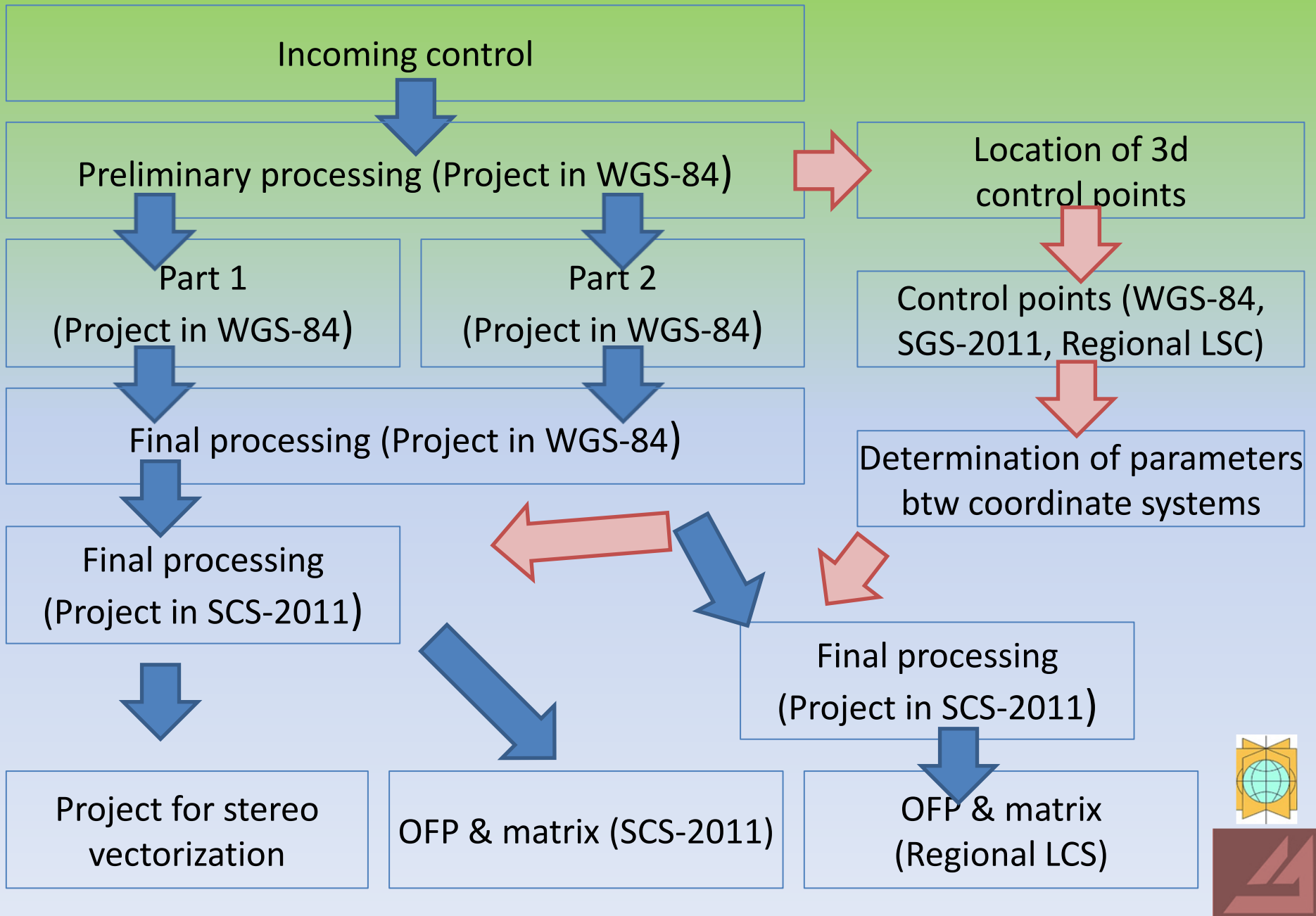
Initial data

- aerial survey images;
- Image data (UTM WGS-84, CSC-2011, Regional LCS)

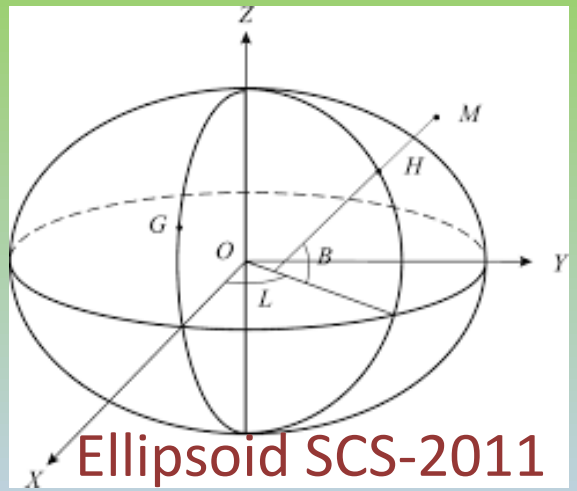
Demands for final production

- OFP and matrix
  *.geotif,
  SCS-2011, LCS, 1:2000
- report materials
- metadata files

Photogrammetric processing



State coordinate system 2011 (Geodetic coordinate system 2011)



Ellipsoid SCS-2011

SCS-2011

SCS-2011
- FAGN
- HGN
- SGN

UTM WGS-84 → SCS-2011

UTM WGS-84 → Regional LCS

What type of parameters should be used?

We presume Standard parameters use

Local parameters only!!!

Imagery data and 3d control points determination identity

GNSS determination for imagery data

GNSS determination for 3d control points

UTM WGS-84 ⇔ UTM WGS-84

1st way

Local or standard parameters

SCS-2011 SCS-2011

SCS-2011* SCS-2011*

2d way

Standard parameters

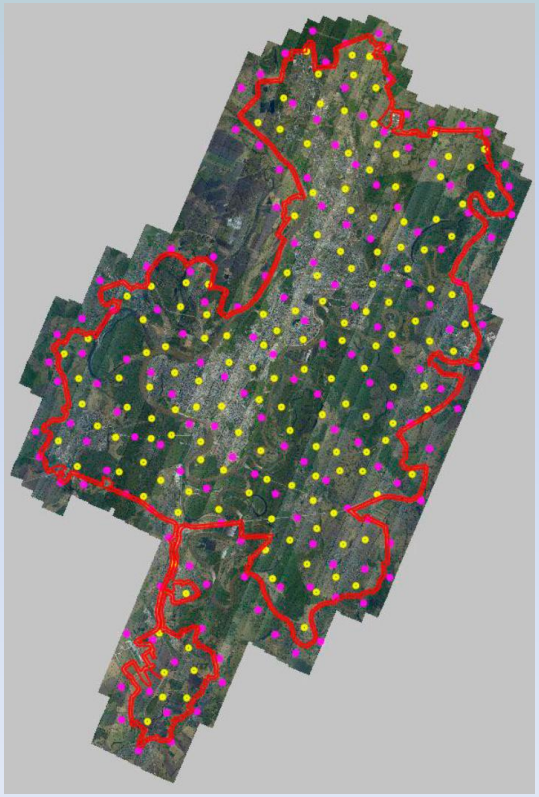
UTM WGS-84 UTM WGS-84

* basic SGN in SCS-2011 geostations should be taken in process

3d control points determination

SCS-2011 station have been taken in process in all territories

Territory	Number of transformation points	Number of control points
Chelyabinsk, 500 sq.km	140	130
Nizhni Novgorod, 600 sq.km	150	140
Ufa, 700 sq.km	160	150



Transfer parameters determination

Two types of soft is used to determine:

- Photomod + Geocalculator + Compute 7 parameters;
- Credo Transcor (7 parametrical transf. copm. with Helmert transf.);
- Local utilites

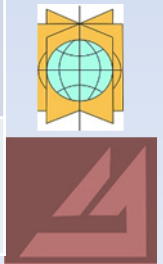
+

Control in Leica Geooffice Soft

Decision: standard parameters local parameters

Type of transfer parameters comparison in photogrammetric processing

Coordinate system	Chelyabinsk	Nizhni Novgorod	Ufa
to SCS-2011	standard	local	standard
to Regional LCS	local		



The results of orthorectification part

- Orthophotoplans & matrix (SCS-2011, LCS);
- Projects (UTM WGS-84 + H_{ell}, SCS-2011 + H_{orth}, LCS + H_{orth})

Further use for topographic plans 1:2 000

- Additional project control for the purposes of stereovectorization

Substandard: $P_x = 80\%$, $P_y = 40\%$

$P_x = 80\%$, $P_y = 40\%$

$P_x = 60\%$, $P_y = 30\%$ additional processing

As a result (1)

One-way dependence btw the type aerial camera and processing time

Chelyabinsk

(Number of images: 8000
Area: 500 sq.km)
Aerial camera:
Leica RCD30 Penta

4 specialists
4.5 mnths

Ufa

(Number of images: 4000
Area: 700 sq.km)
Aerial camera:
Phase One iXU-RS-1900

4 specialists
4.6 mnths

Nizhi Novgorod

(Number of images: 1100
Area: 600 sq.km)
Aerial camera:
Vexcel UltraCam

3 specialists
4 mnths

Processing CSC-2011 coordinate data:

1. The use of «georefferencing» approach

* basic SGN in SCS-2011 geostations should be taken in process

2. Check-out transfer parameters in different types of soft

As a result (3)

Saving *.geotiff-files think over the further use of the material:

1. To indicate the projection local datum parameters in CS description
2. To indicate the projection standard datum parameters in CS description
3. To indicate CS as neutral

Additional experiment to reveal the difference btw types of soft and coordinate system description in *.geotiffs and other types of raster and vector data

Type of soft	Products	Result
Photogrammetric	Photomod, Inpho (Test of 2010)	Reveal only coordinate coincidence without CS title
Geodetic	Leica Geooffice, Credo	Reveal only coordinate coincidence without CS title
GIS & carthographic	ArcView 9.3, Panorama	Recalculates data when CS title do not coincide

Thank you for attention

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