

Neue Methoden zur Bilddatenaufbereitung und -auswertung:

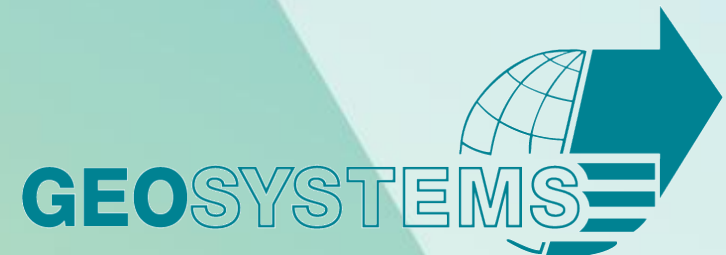
farbtreuer Resolution Merge und
flächenscharfer Veränderungsnachweis

Tatjana Koukal, Jörg Heblinski
GEOSYSTEMS GmbH



HEXAGON
GEOSPATIAL

CHANNEL PARTNER



- Vertriebspartner von Hexagon Geospatial
 - Professional Services
 - Lösungsentwicklung
 - Technischer Support
 - Schulungen
-
- ...seit über 25 Jahren
 - Firmensitz in Germering bei München
 - www.geosystems.de



HEXAGON
GEOSPATIAL

CHANNEL PARTNER

The Geospatial Power Portfolio

POWER

Portfolio

Suites

PRODUCER
PROVIDER
PLATFORM



GEOSYSTEMS Produktportfolio

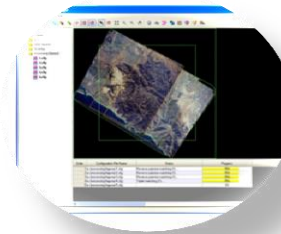
GeoMedia



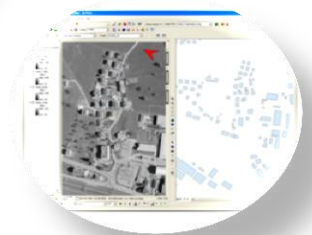
**ERDAS
IMAGINE**



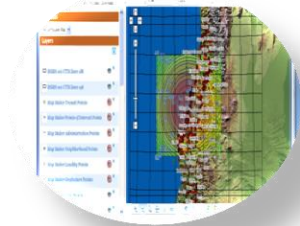
**IMAGINE
Photogrammetry**



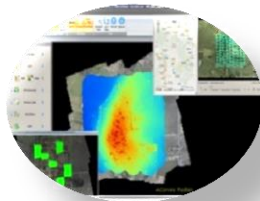
Stereo Analyst



**ERDAS
APOLLO**




**Photogrammetrische Prozessierung
von UAS-Daten**



**3D-Gebäude-
modellierung**

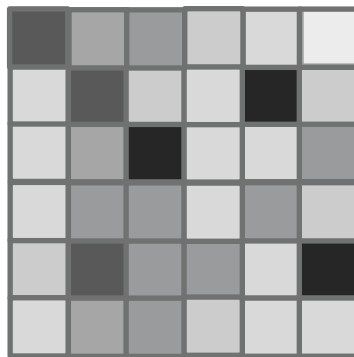


The background of the slide is composed of several overlapping geometric shapes in various shades of teal and green. A large, dark teal triangle is positioned in the upper left quadrant. To its right, a lighter teal triangle points downwards. The bottom half of the slide features a white horizontal band containing the text, with a light green and teal geometric pattern below it.

Resolution Merge mit ERDAS IMAGINE – What's new?

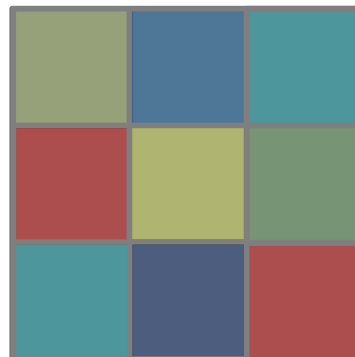
Resolution Merge

- **Synonyme:** Pan-Sharpening, Image Fusion, Sensor Merge, Sensor Fusion, ...
- **Prinzip:**



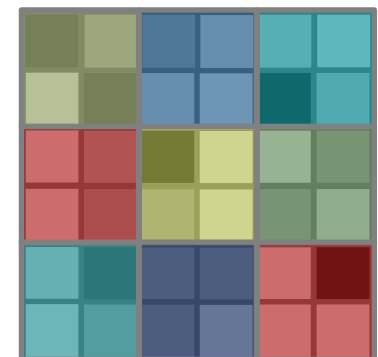
High-resolution
Pan-Bild

+



Low-resolution
Multispektral-Bild

=



High-resolution
Multispektral-Bild

Voraussetzungen:

- gleiche Aufnahmegeometrie und Beleuchtungsverhältnisse (ideal: simultane Aufnahme)
- saubere Co-registrierung der zu kombinierenden Kanäle
- spektrale Überlappung zwischen Pan- und Multispektralkanälen

Resolution Merge

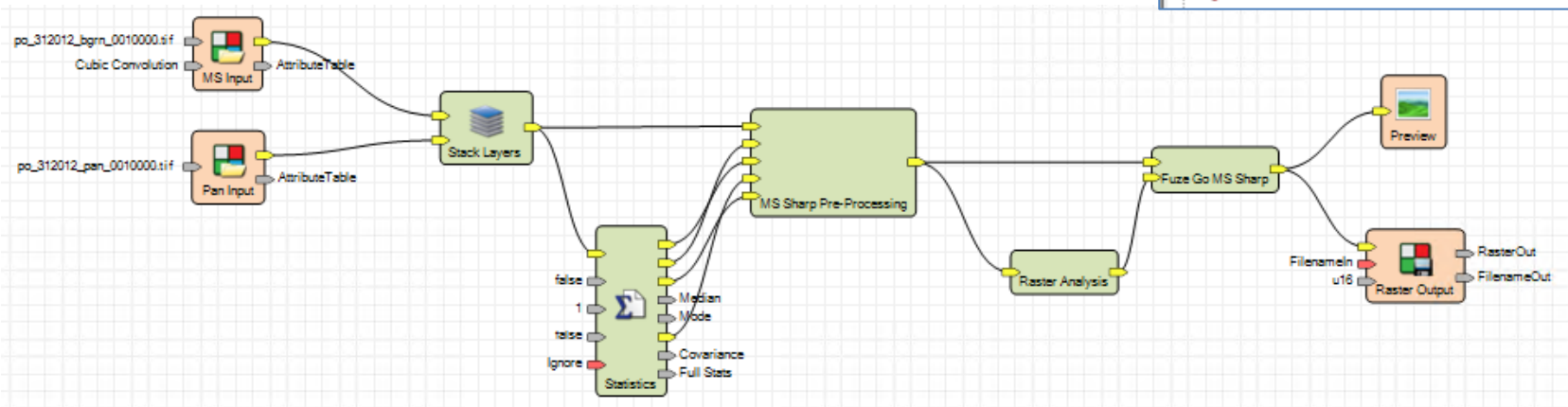
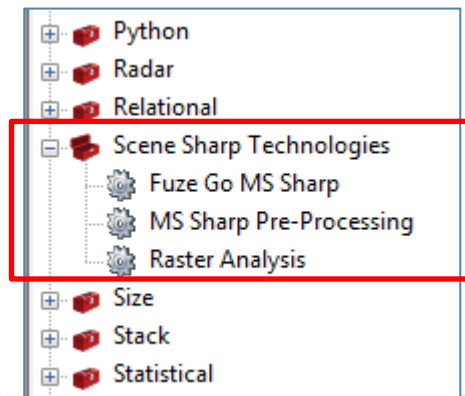
- Ziel:
 - visuell ansprechende Bilder
 - verbesserte Ergebnisse bei Klassifikation, Change detection, etc.
- Methoden (Auswahl)
 - IHS
 - PCA
 - High Pass Filter Merge (HPF)
 - Gram-Schmidt
 - Wavelet
 - Projective Resolution Merge u.a.
- Anforderungen:
 - „Farbtreue“ (Bildstatistik soll nicht verändert werden) - wichtig bei Weiterverwendung für Bildanalyse, wie z.B. Change Detection
 - keine Artefakte (z.B. am Rand heller Objekte)
 - Robustheit (d.h. Erfolg unabhängig von Bildinhalt und Sensor)

Resolution Merge mit Fuze Go™

- UNB PanSharp Algorithmus (Zhang 2004), z.B. von DigitalGlobe eingesetzt
- implementiert von *Scene Sharp Technologies Inc.* (USA) unter dem Namen *Fuze Go*
- basierend auf Korrelationen zwischen Pan-Kanal und den Multispektral-Kanälen (least-square best fit)
- voll-automatische Prozessierung, keine Parametereingabe erforderlich
- geeignet für eine große Anzahl an Spektralkanälen
- gute Ergebnisse spektral (Farbe) und räumlich
- Erfolg unabhängig von Sensor, Spektralkanälen und Bildinhalt

Resolution Merge mit Fuze Go™

- Stand-alone Tool (für optische und Radar-Daten)
- Erweiterung für ERDAS IMAGINE:
 - Fuze Go™ MS Sharp Model
 - zusätzliche Operatoren im Spatial Modeler
 - nicht im GUI



(derzeit nur für optische Daten verfügbar)

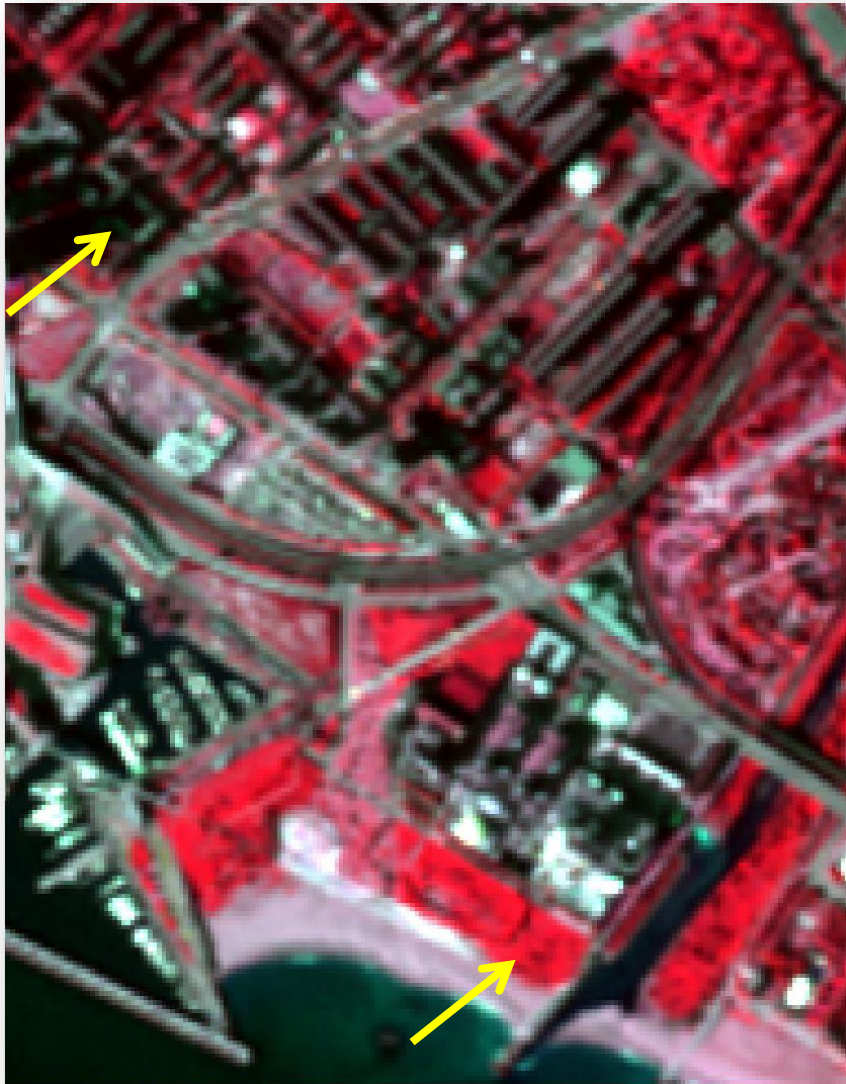
Vergleich Pleiades | RGB

Original MS

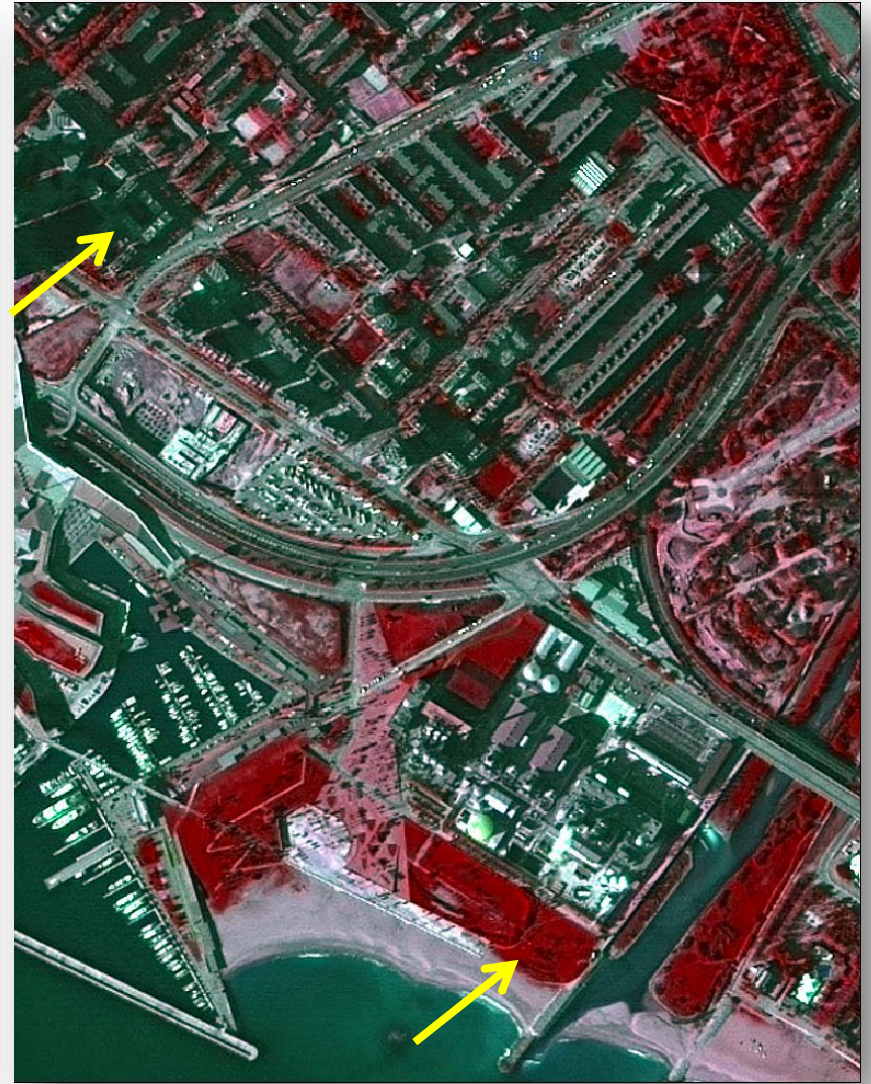
Fuze Go



Vergleich SPOT-6 | CIR



Original

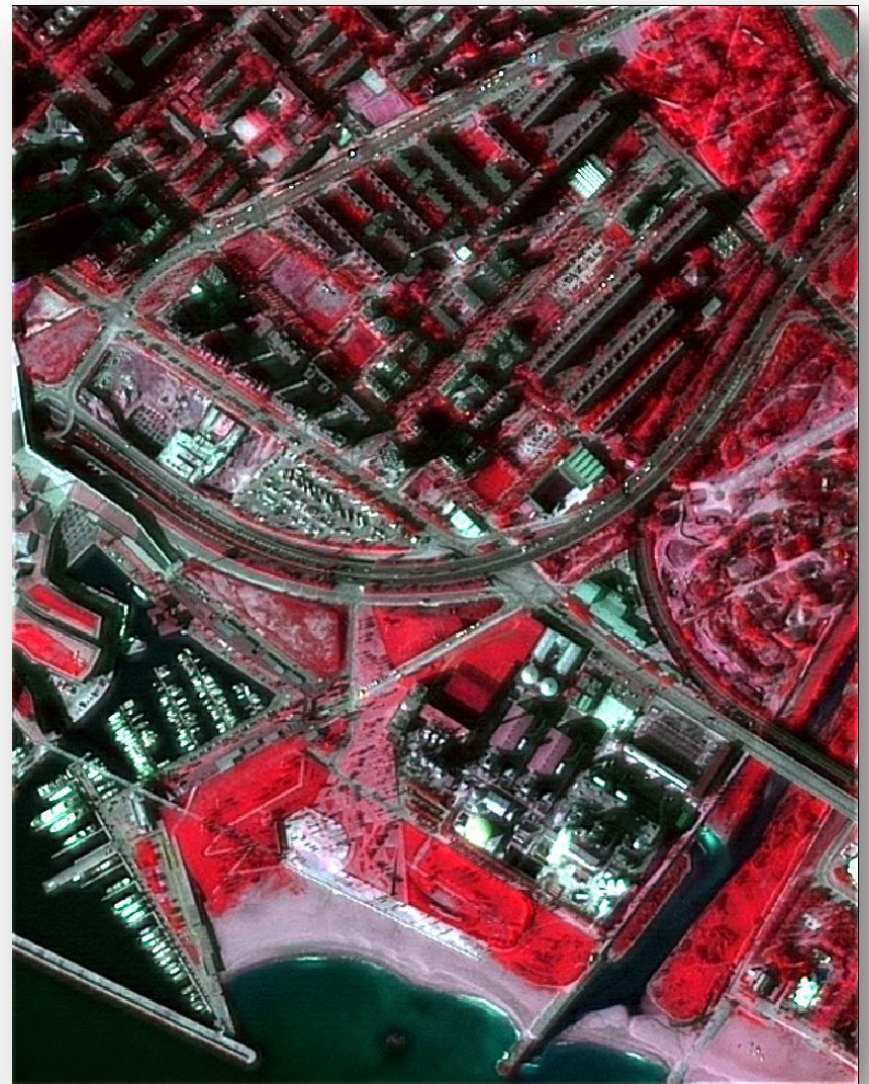


Subtractive Resolution Merge

Vergleich SPOT-6 | CIR

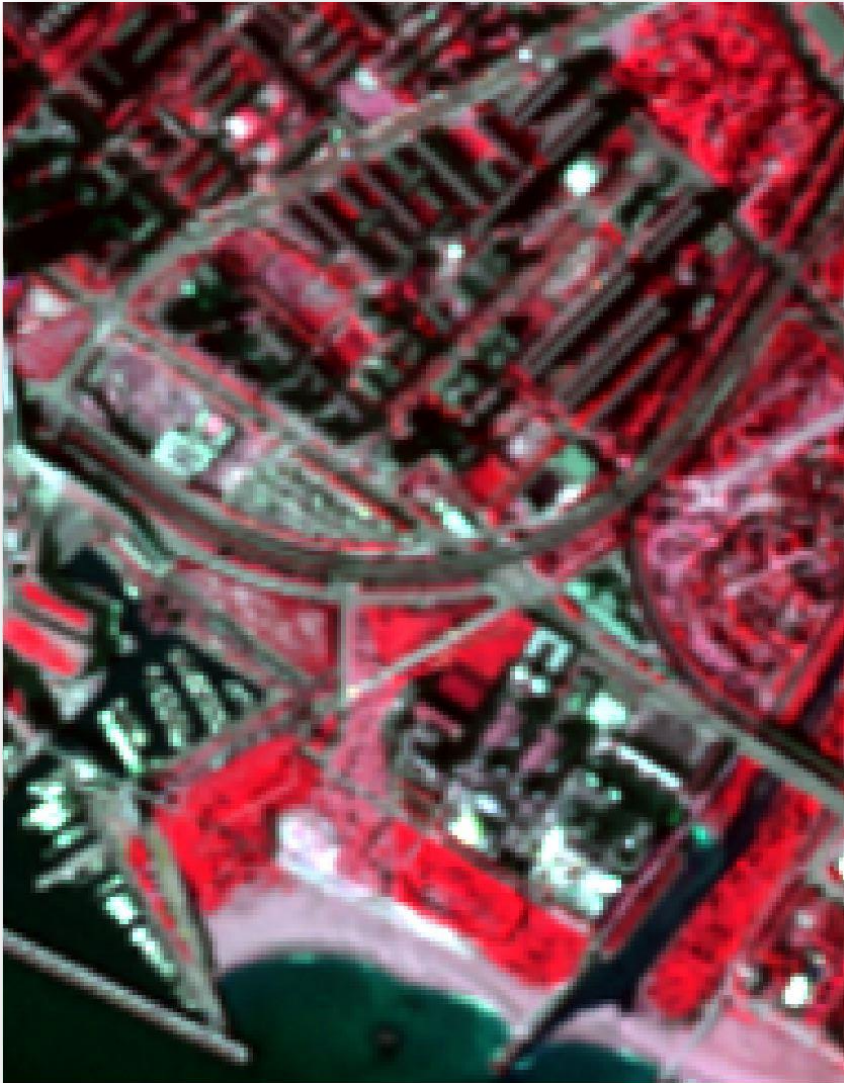


Original

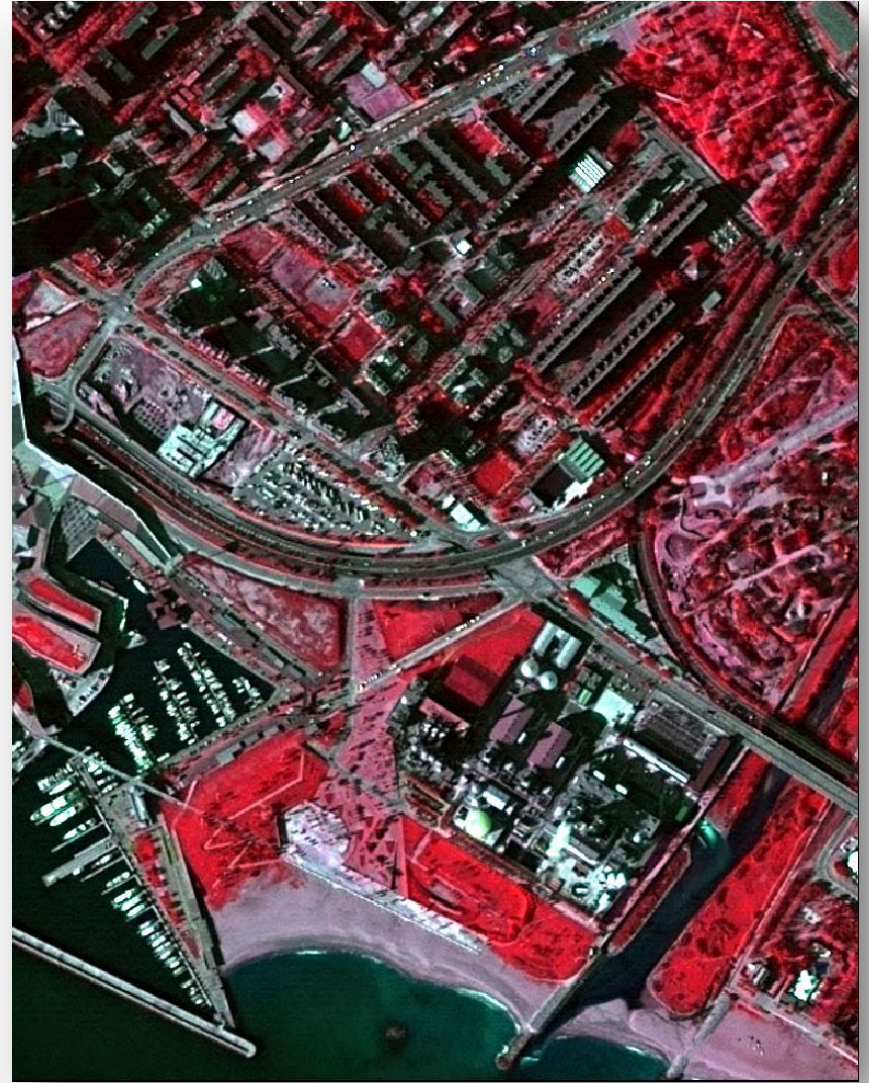


High Pass Filter Merge

Vergleich SPOT-6 | CIR



Original

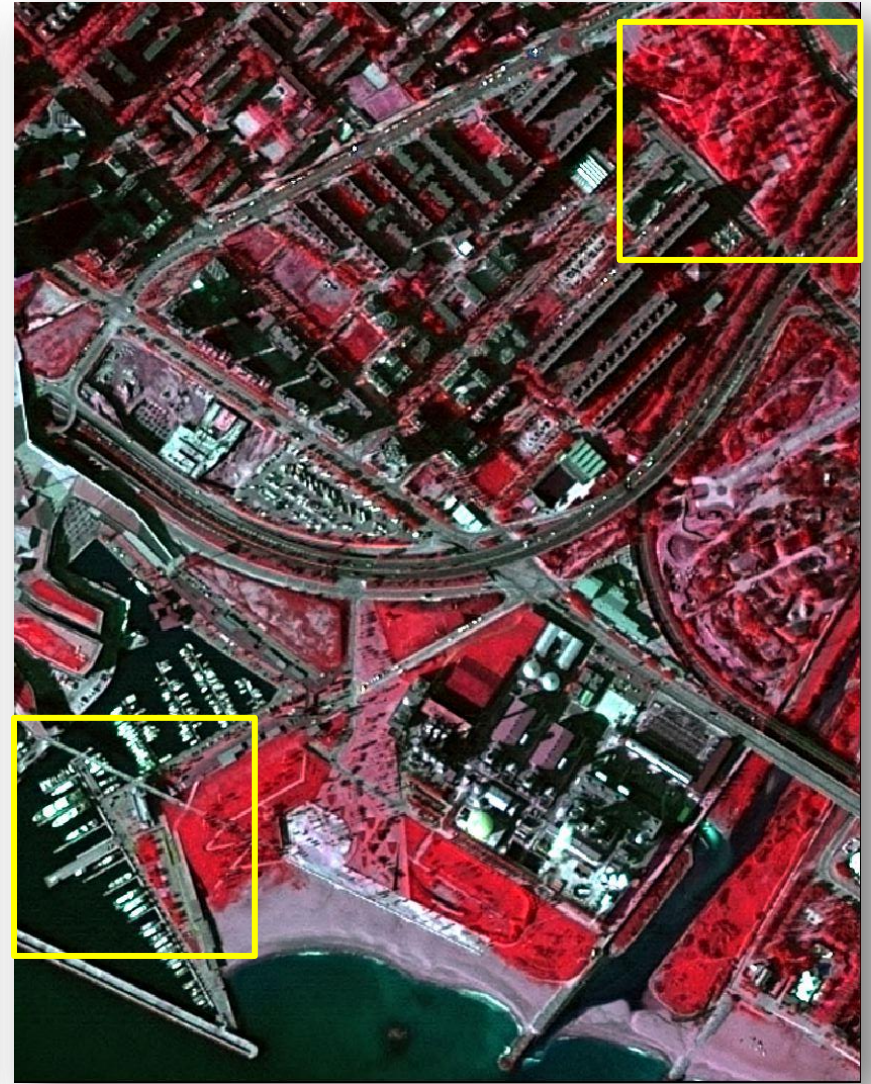


FuzeGo

Vergleich SPOT-6 | CIR

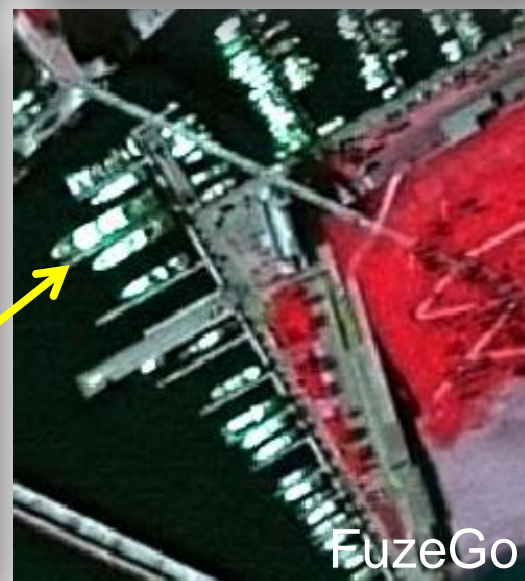


Original

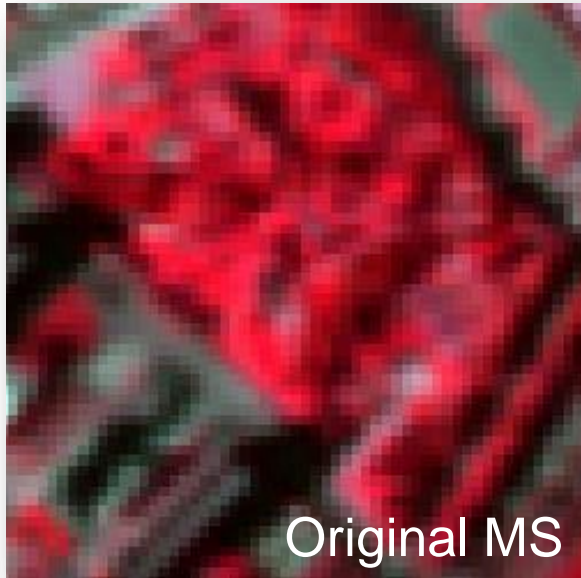


FuzeGo

Vergleich SPOT-6 | CIR



Vergleich SPOT-6 | CIR



Vorteile von Fuze Go in ERDAS IMAGINE

- Farbtreue
- Detailreichtum von Pan-Kanal sehr gut im Multispektralbild wiedergegeben
- Keine Artefakte (Halo-Effekt-etc.)
- Einfache Handhabung
- nahezu keine Einschränkung bezüglich Anzahl der Spektralkanäle
- Einbindung des Pansharpening-Prozesses in Prozessierungsketten über den Spatial Modeler
- geplant: SWIR-Kanäle, Radar

Flächenscharfer Veränderungsnachweis mit ERDAS IMAGINE und GeoMedia

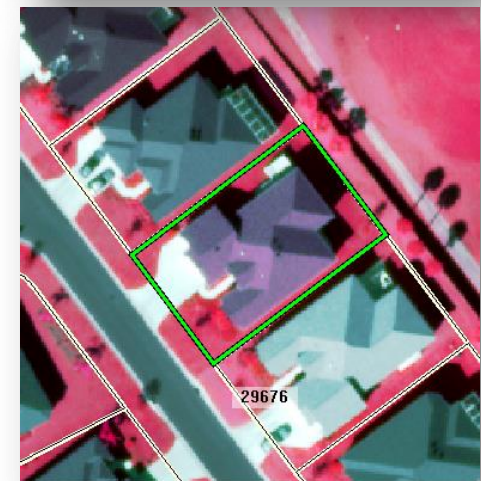
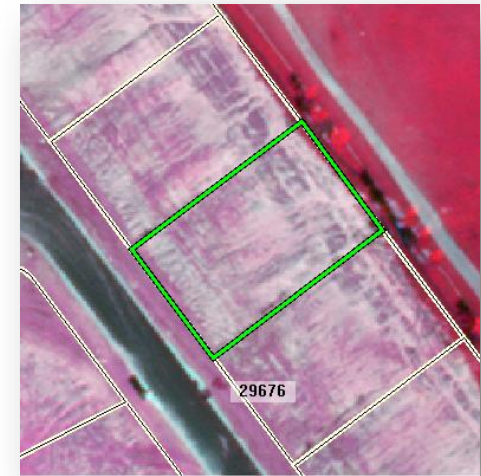
Ziel – Daten – Workflow

■ Ziel:

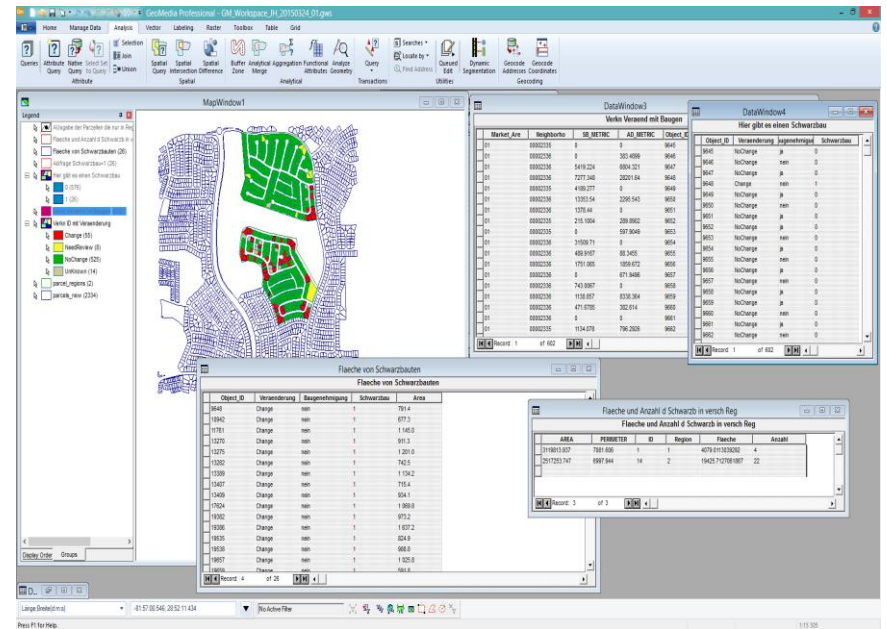
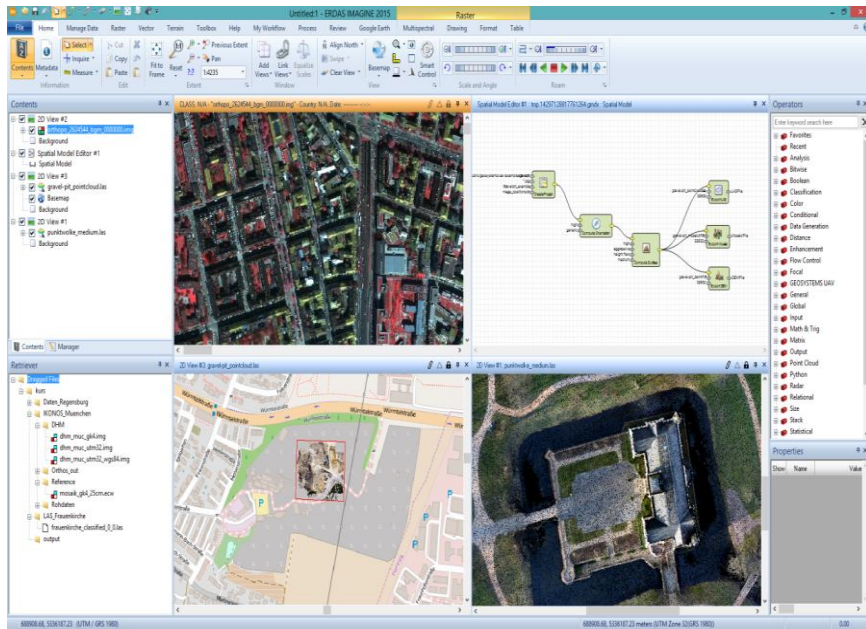
- Auf welchen Flurstücken haben Veränderungen (Bauvorhaben) stattgefunden?
- Welche Baumaßnahmen davon sind illegal?

■ Daten:

- Bilder von 2 versch. Aufnahmezeitpunkten
- Flurstücksgrenzen (Vektor-Format)
- Liste der bewilligten Bauvorhaben



Workflow



Rasterverarbeitung mit
ERDAS IMAGINE



Vektorverarbeitung mit
GeoMedia

Workflow

The screenshot displays a complex GIS workflow. The main map window shows a street map with several green and red polygons overlaid. The DataWindow1 shows a table with columns: Market_Area, Neighboris, SR_METRIC, AD_METRIC, Object_ID, and Name. The DataWindow2 shows a table with columns: Object_ID, Schwärzung, Baugemenge, Schwarzbau, and Area. The DataWindow3 shows a table with columns: AREA, PERIMETER, ID, Region, Fläche, and Anzahl. The Operators window shows a flowchart with various GIS operations like 'Fläche von Schwarzbauzonen (2B)', 'Fläche von Schwarzbauzonen (2C)', 'Fläche von Schwarzbauzonen (2D)', 'Fläche von Schwarzbauzonen (2E)', 'Fläche von Schwarzbauzonen (2F)', 'Fläche von Schwarzbauzonen (2G)', 'Fläche von Schwarzbauzonen (2H)', 'Fläche von Schwarzbauzonen (2I)', 'Fläche von Schwarzbauzonen (2J)', 'Fläche von Schwarzbauzonen (2K)', 'Fläche von Schwarzbauzonen (2L)', 'Fläche von Schwarzbauzonen (2M)', 'Fläche von Schwarzbauzonen (2N)', 'Fläche von Schwarzbauzonen (2O)', 'Fläche von Schwarzbauzonen (2P)', 'Fläche von Schwarzbauzonen (2Q)', 'Fläche von Schwarzbauzonen (2R)', 'Fläche von Schwarzbauzonen (2S)', 'Fläche von Schwarzbauzonen (2T)', 'Fläche von Schwarzbauzonen (2U)', 'Fläche von Schwarzbauzonen (2V)', 'Fläche von Schwarzbauzonen (2W)', 'Fläche von Schwarzbauzonen (2X)', 'Fläche von Schwarzbauzonen (2Y)', 'Fläche von Schwarzbauzonen (2Z)'. The Properties window shows the 'Name' and 'Value' of the selected object.



Rasterverarbeitung mit
ERDAS IMAGINE

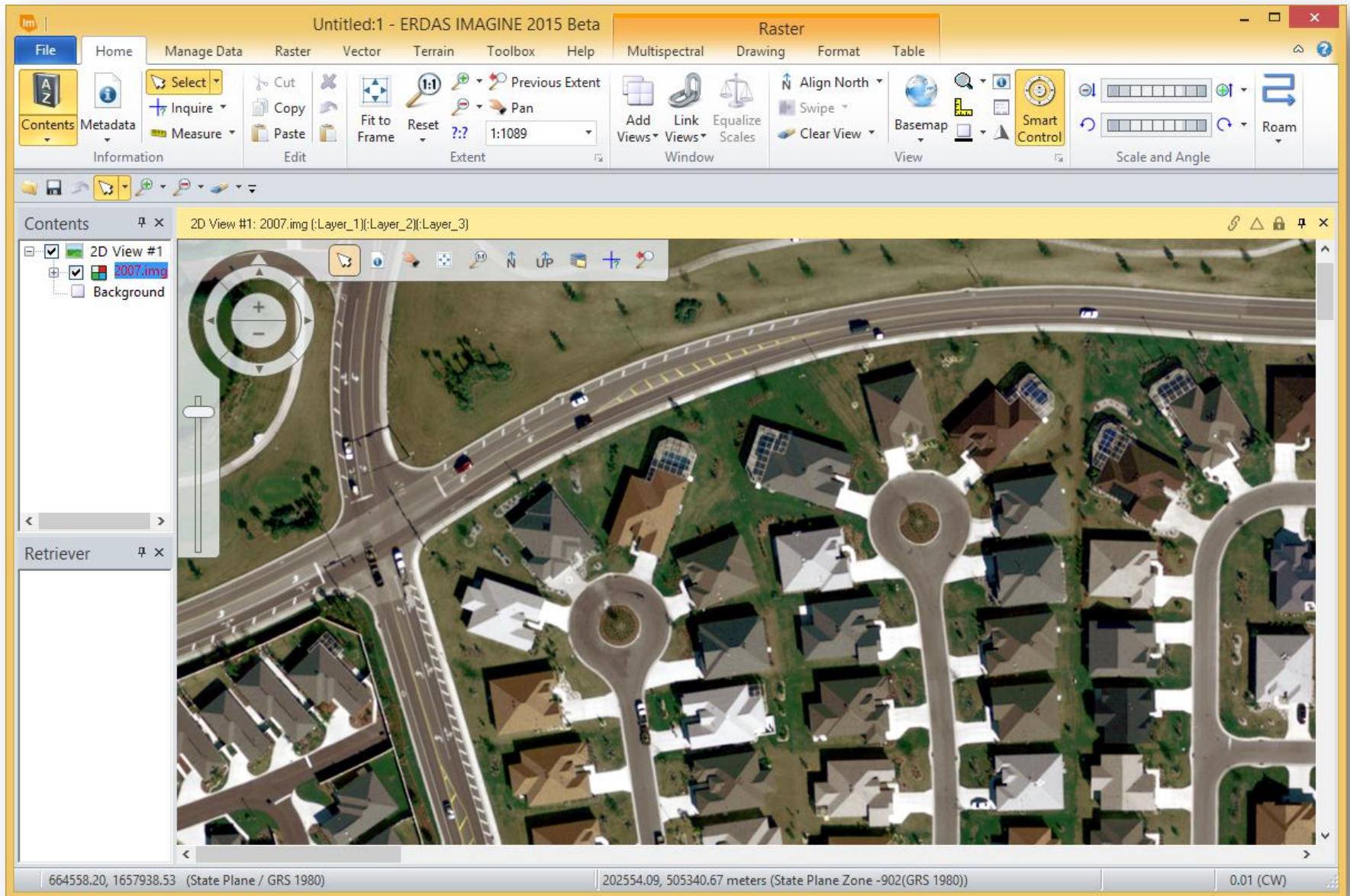


Vektorverarbeitung mit
GeoMedia

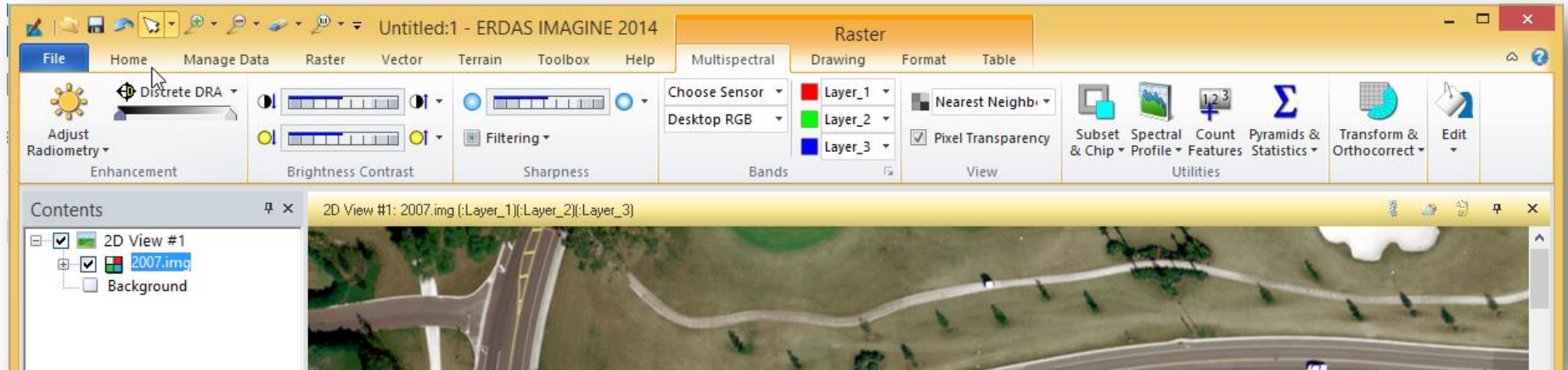
Workflow im Detail

Teil 1 - Veränderungsnachweis mit IMAGINE

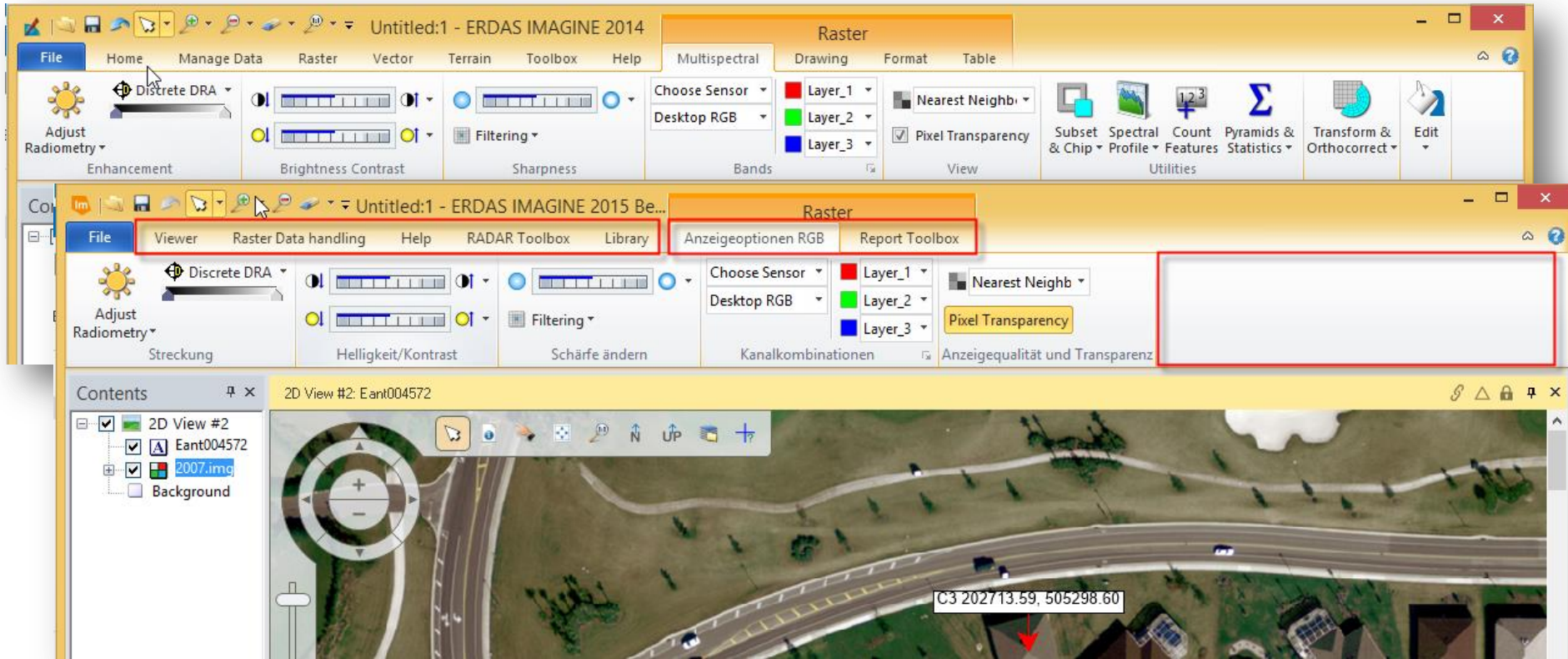
ERDAS IMAGINE



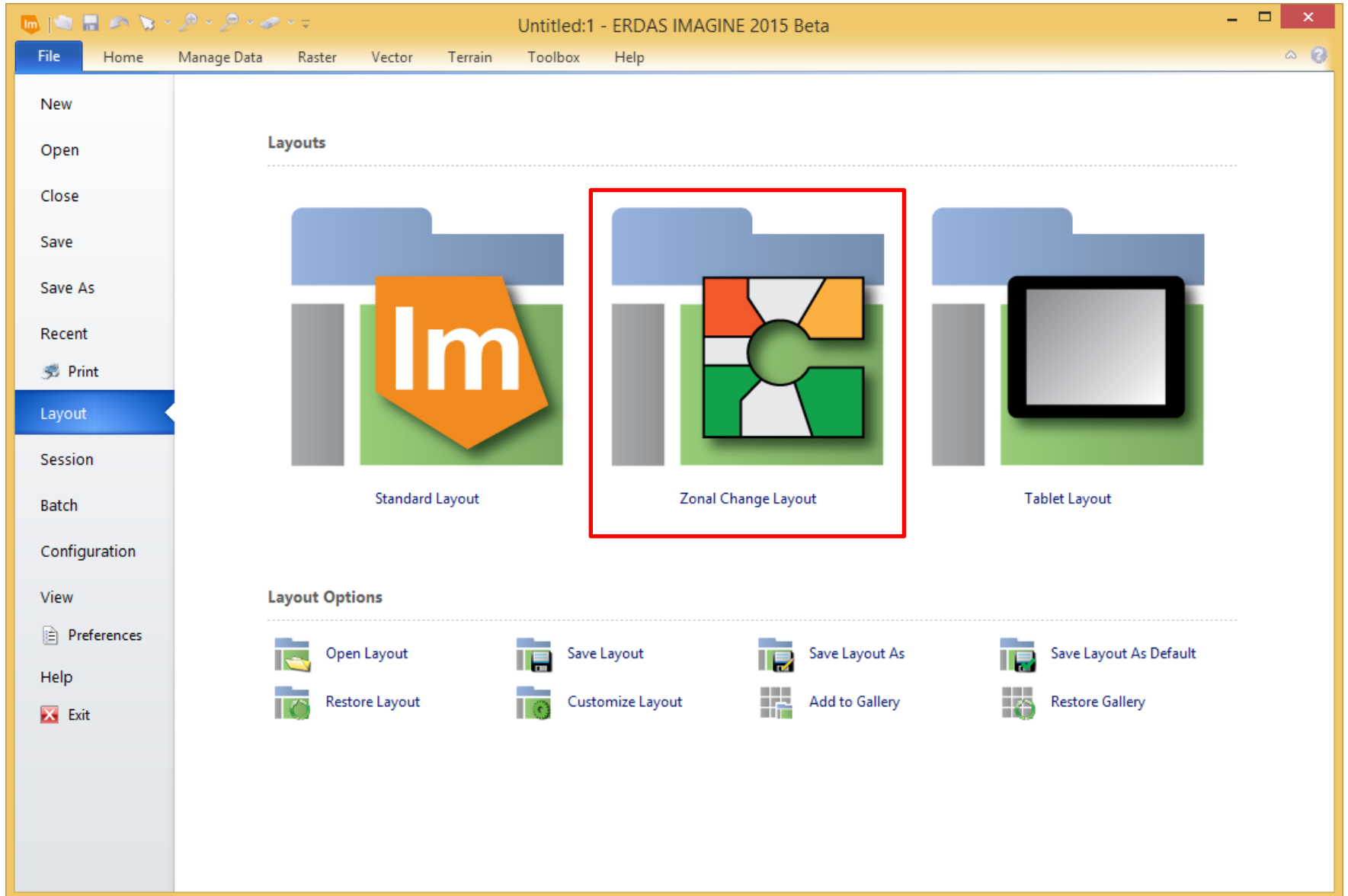
IMAGINE – Standard-Layout



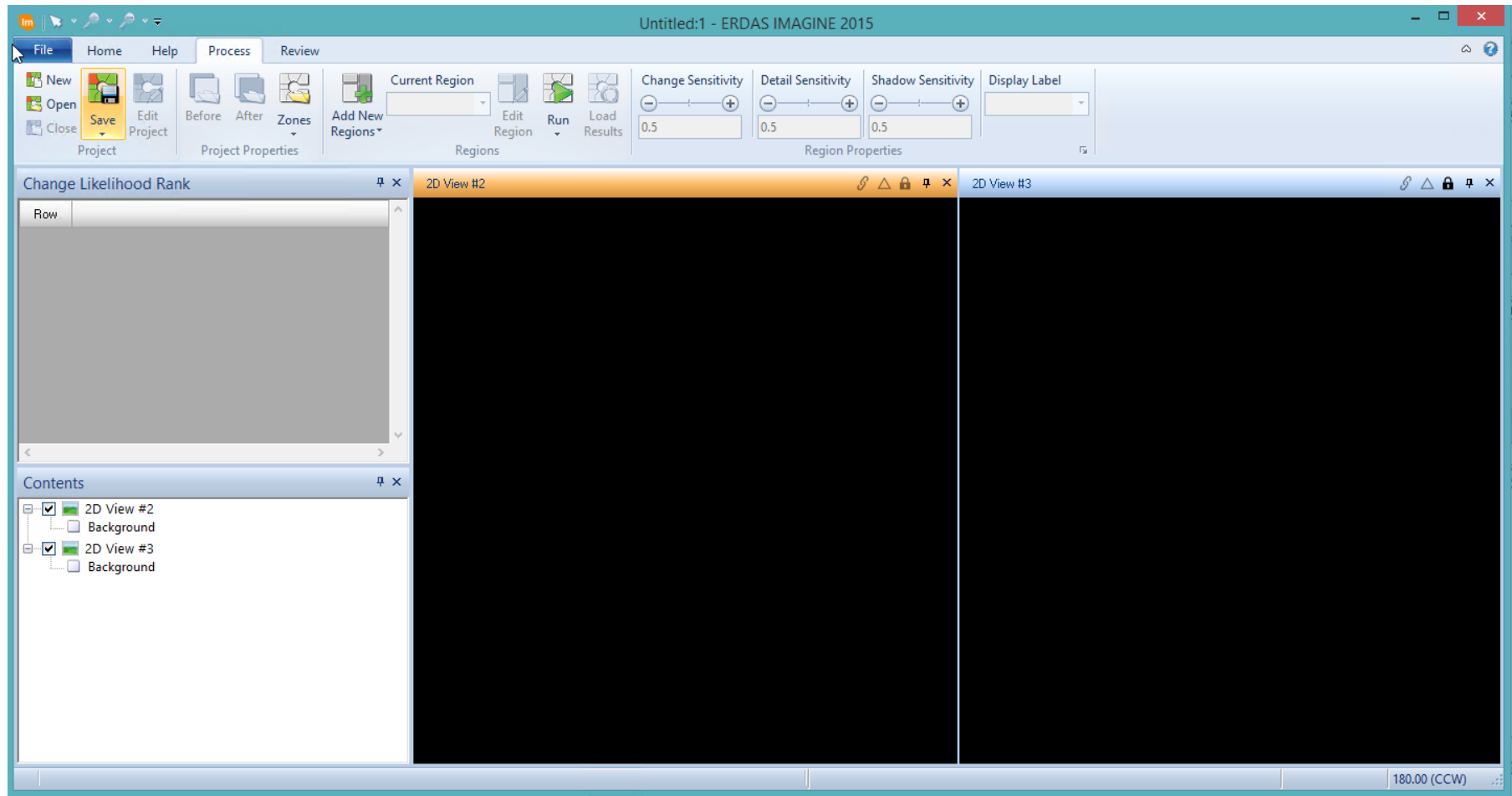
IMAGINE – angepasstes Layout



IMAGINE – angepasstes Layout

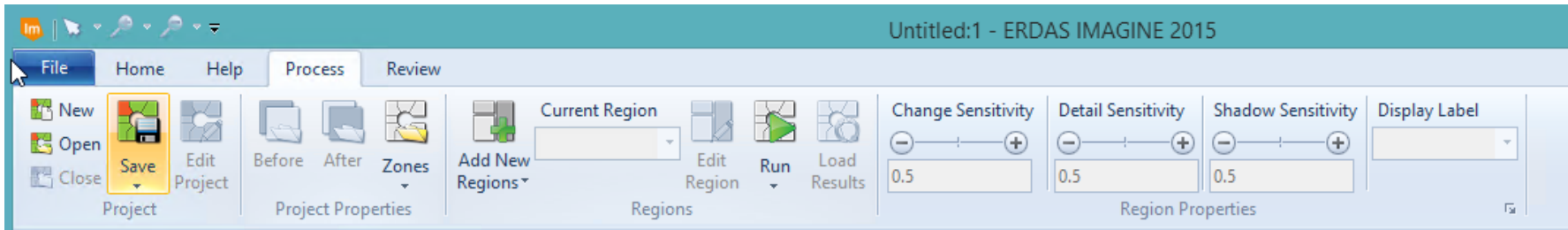


IMAGINE – Zonal Change Layout

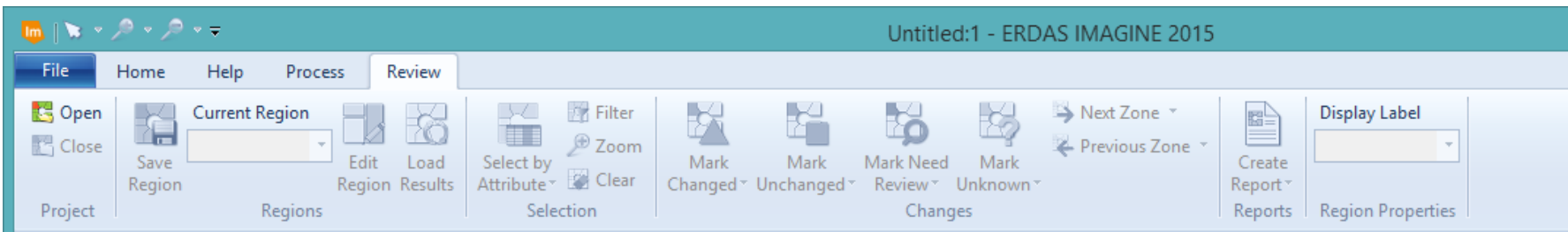


Zonal Change

- Process-Tab



- Review-Tab



Zonal Change – Setup

The screenshot displays the ERDAS IMAGINE 2015 software interface for a project named "zonalchange_01:1". The "Process" tab is active, and the "Project Properties" section is highlighted with a red box. This section includes buttons for "Before", "After", and "Zones", along with a "Project Properties" label. The "Region Properties" section is also visible, featuring sliders for "Change Sensitivity", "Detail Sensitivity", and "Shadow Sensitivity", all set to 0.5, and a "Display Label" dropdown menu.

The main workspace is divided into three panes:

- Change Likelihood Rank:** A table with a "Row" header and an empty body.
- 2D View #1:** A large black rectangular area.
- 2D View #2:** A large black rectangular area.

The "Contents" pane on the left shows a tree view with the following structure:

- 2D View #1
 - Background
- 2D View #2
 - Background

The status bar at the bottom right indicates a value of 180.00 (CCW).

Zonal Change – Setup

zonalchange_01:1 - ERDAS IMAGINE 2015

File Home Help Process Review

New Open Close Save Edit Project Before After Zones Add New Regions Current Region All Zones Edit Region Run Load Results Change Sensitivity 0.5 Detail Sensitivity 0.5 Shadow Sensitivity 0.5 Display Label OBJECTID

Change Likelihood Rank

Row	Data ID	Label	Status	Change
1	1	19645		
2	2	19646		
3	3	19647		
4	4	19648		
5	5	19649		
6	6	19650		
7	7	19651		
8	8	19652		

Contents

- 2D View #1
 - parcels_new.shp
 - 2007.img
 - Background
- 2D View #2
 - parcels_new.shp
 - 2008.img
 - Background

Before Image: parcels_new.shp After Image: parcels_new.shp

parcels_new.shp

Record	OBJECTID	PIN	OBJECTID_1	County_Cod	PIN_1	Roll_Type	Roll_Year	P_Use_1	Special_As	Total_Just	Change_Jus	Change_J_1	School_Ass	Total
1	19645.D25L03		23876.70		D25L033	R	2013	00100		124970.00000000	0.00000000		123770.00000000	1249
2	19646.D25M0		23925.70		D25M026	R	2013	00100		216650.00000000	0.00000000		215150.00000000	2166
3	19647.D25M2		24110.70		D25M211	R	2013	00100		218480.00000000	0.00000000		216880.00000000	2184

203347.12, 505113.21 meters (State Plane Zone -902(GRS 1980)) 0.00

Zonal Change – Setup

zonalchange_01:1 - ERDAS IMAGINE 2015

File Home Help Process Review

New Open Save Edit Project Close

Before After Zones

Current Region All Zones Edit Region Load Results

Change Sensitivity 0.5 Detail Sensitivity 0.5 Shadow Sensitivity 0.5 Display Label OBJECTID

Region Properties

Change Likelihood Rank

Row	Data ID	Label	Status	Change
1	1	19645		
2	2	19646		
3	3	19647		
4	4	19648		
5	5	19649		
6	6	19650		
7	7	19651		
8	8	19652		

Contents

- 2D View #1
 - parcels_new.shp
 - 2007.img
 - Background
- 2D View #2
 - parcels_new.shp
 - 2008.img
 - Background

One per Attribute Query

One per Unique Attribute

Using Region Polygon File

- One per File
- One per Polygon

Additional Methods

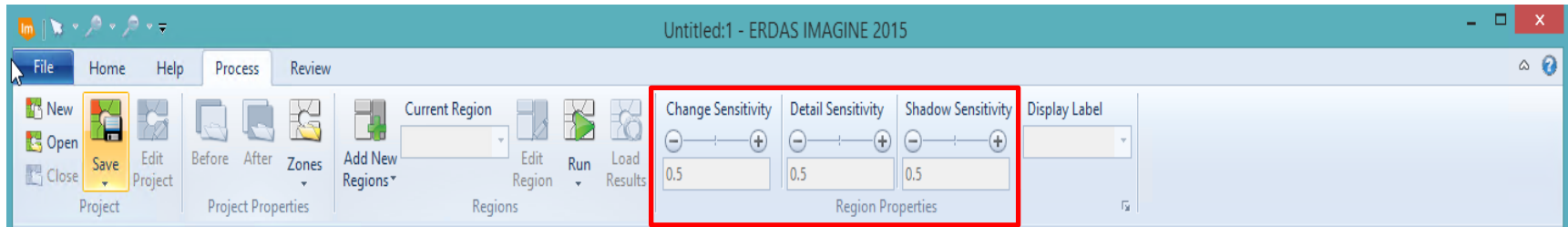
- From AutoGrid
- Equal Count
- All Zones Region

parcels_new.shp

Record	OBJECTID	PIN	OBJECTID_1	County_Cod	PIN_1	Roll_Type	Roll_Year	P_Use_1	Special_As	Total_Just	Change_Jus	Change_J_1	School_Ass	Total
1	19645	D25L0C	23876 70	D25L033	R	2013	00100	00100		124970.00000000	0.00000000		123770.00000000	1249
2	19646	D25M0	23925 70	D25M026	R	2013	00100	00100		216650.00000000	0.00000000		215150.00000000	2166
3	19647	D25M2	24110 70	D25M211	R	2013	00100	00100		218480.00000000	0.00000000		216880.00000000	2184

0.00

Zonal Change – Setup



Berechnung der **Veränderungswahrscheinlichkeit**:

	--	+
Change Sensitivity	nur extreme Grauwert-Veränderungen werden berücksichtigt	auch geringe Grauwert-Veränderungen werden berücksichtigt
Detail Sensitivity	nur großflächige Veränderungen werden berücksichtigt	auch kleinräumige Veränderungen werden berücksichtigt
Shadow Sensitivity	Schattenbereiche werden nicht berücksichtigt	Schattenbereiche werden berücksichtigt

Tipp: Bei stark unterschiedlichen Sonnenständen einen niedrigen Shadow-Sensitivity-Wert wählen!

Zonal Change – Run

zonalchange_01:1 - ERDAS IMAGINE 2015

File Home Help Process Review

New Open Close Save Edit Project Before After Zones Add New Regions Current Region Region 1 Edit Region Run Load results Change Sensitivity 0.67 Detail Sensitivity 0.2 Shadow Sensitivity 0.86 Display Label OBJECTID

Change Likelihood Rank

Row	Data ID	Label	Status	Change
1	1	19645		
2	2	19646		
3	3	19647		
4	4	19648		
5	5	19649		
6	6	19650		
7	7	19651		
8	8	19652		

Contents

- 2D View #1
 - parcels_new.shp
 - 2007.img
 - Background
- 2D View #2
 - parcels_new.shp
 - 2008.img
 - Background

Before Image: parcels After Image: parcels_new.shp

parcels_new.shp

Record	OBJECTID	PIN	OBJECTID_1	County_Cod	PIN_1	Roll_Type	Roll_Year	P_Use_1	Special_As	Total_Just	Change_Jus	Change_J_1	School_Ass	Total
1	19645 D25L0C		23876 70		D25L033	R	2013	00100		124970.00000000	0.00000000		123770.00000000	1249
2	19646 D25M0		23925 70		D25M026	R	2013	00100		216650.00000000	0.00000000		215150.00000000	2166
3	19647 D25M2		24110 70		D25M211	R	2013	00100		218480.00000000	0.00000000		216880.00000000	2184

0.00

Zonal Change – Results

Untitled:1 - ERDAS IMAGINE 2015

File Home Help Process Review

New Open Close Save Edit Project Before After Zones Add New Regions Current Region Edit Region Run Load Results Change Sensitivity 0.5 Detail Sensitivity 0.5 Shade 0.5 Region Properties

Change Likelihood Rank

Row	Data ID	Label	Status	Change
143	245	21753	?	[Bar]
475	1236	29676	?	[Bar]
490	1251	29743	?	[Bar]
164	266	21774	?	[Bar]
174	311	23282	?	[Bar]
229	669	27400	?	[Bar]
150	252	21760	?	[Bar]
28	28	19908	?	[Bar]
505	1459	31806	?	[Bar]
16	16	19660	?	[Bar]
128	203	21611	?	[Bar]
630	1937	35721	?	[Bar]
537	1708	35112	?	[Bar]
474	1235	29675	?	[Bar]
276	989	29326	?	[Bar]
274	987	29324	?	[Bar]
497	1451	31627	?	[Bar]
594	1839	35312	?	[Bar]
483	1244	29684	?	[Bar]
522	1691	35095	?	[Bar]
533	1703	35107	?	[Bar]
159	261	21769	?	[Bar]
168	305	23271	?	[Bar]
325	1038	29383	?	[Bar]
17	17	19661	?	[Bar]
396	1109	29547	?	[Bar]

Before Image: parcels_new.shp

Contents

- 2D View #1
 - parcels_new.shp
 - 2007.img
 - Background
- 2D View #2
 - parcels_new.shp
 - 2008.img
 - Background

parcels_new.shp

Record	OBJECTID	PIN	OBJECTID_1	County_Cod	PIN_1	Roll_Type	Roll_Year	P_Use_1	Special_As
1235	29675	D25P119	24603 70		D25P119	R	2013	00100	
1236	29676	D25P061	24545 70		D25P061	R	2013	00100	
1237	29677	D25P100	24584 70		D25P100	R	2013	00100	

Zonal Change - Review

Changes

Mark Changed
 Mark Unchanged
 Mark Need Review
 Mark Unknown

Next Zone ▾
Previous Zone ▾

Change Likelihood Rank

Row	Data ID	Label	Status	Change
143	245	21753	▲	█
475	1236	29676	?	█
490	1251	29743	?	█
164	266	21774	?	█
174	311	23282	?	█
229	669	27400	?	█
150	252	21760	?	█
28	28	19908	?	█

Contents

- 2D View #1
 - parcels_new.shp
 - 2007.img
 - Background
- 2D View #2
 - parcels_new.shp
 - 2008.img
 - Background

parcels_new.shp


Record	OBJECTID	PIN	OBJECTID_1	County_Cod	PIN_1	Roll_Type	Roll_Year	P_Use_1	Special_As	Total_Just	Change_Jus	Change_J_1	School_Ass	Total
1235	29675	D25P119	24603 70		D25P119	R	2013	00100		184220.00000000	0.00000000		182920.00000000	1842
1236	29676	D25P061	24545 70		D25P061	R	2013	00100		279640.00000000	0.00000000		277940.00000000	2796
1237	29677	D25P100	24584 70		D25P100	R	2013	00100		280720.00000000	0.00000000		279120.00000000	2807

0.00


Zonal Change - Review

Row	>	Data ID	Label	Status	Change
236		681	17627	○	
533		1719	25123	▲	
455		1188	19626	▲	
328		1041	19386	▲	
174		311	13282	▲	
177		316	13389	▲	
151		253	11761	▲	
172		309	13275	▲	
406		1119	19557	▲	
134		209	11653	▲	
386		1099	19537	▲	
166		303	13269	▲	
324		1037	19382	▲	
167		304	13270	▲	
133		208	11652	▲	
147		249	11757	▲	
383		1096	19534	▲	
384		1097	19535	▲	
29		29	9909	▲	
397		1110	19548	▲	
161		263	11771	▲	
399		1112	19550	▲	
286	▶	999	19336	○	
175		312	13283	▲	
186		325	13409	▲	
402		1115	19553	▲	
472		1227	19665	▲	
573		1843	25316	▲	
74		105	10924	○	
4		4	9648	▲	
487		1249	19741	▲	
262		975	19288	○	
387		1100	19538	▲	
148		250	11758	▲	
520		1697	25101	▲	


Row	>	Data ID	Label	Status	Change
43		58	10765	■	■
31		31	9911	■	■
30		30	9910	■	■
364		1077	19498	■	■
367		1080	19513	■	■
508		1470	21853	▲	■
84		115	10943	■	■
8		8	9652	■	■
239		952	19241	■	■
87				■	■
42				■	■
7				■	■
8				■	■
27				■	■
23				■	■
44				■	■
3				■	■
432		1189	19623	■	■
192		565	15877	■	■
2		2	9646	■	■
379		1092	19530	■	■
222		596	16455	■	■
299		1012	19349	■	■
217		591	16450	■	■
363		1076	19497	■	■
75		106	10925	■	■
339		1052	19430	■	■
34		34	9914	■	■
375		1088	19526	■	■
380		1093	19531	■	■
381		1094	19532	■	■
382		1095	19533	■	■
602		1937	25721	■	■




Mark
Changed



Mark
Unchanged



Mark Need
Review



Mark
Unknown

Next Zone

Previous Zone

Changes

Zonal Change – Report

zonalchange_01:1 - ERDAS IMAGINE 2015

File Home Help Process Review

Open Close Current Region Region 1 Save Region Edit Region Load Results Select by Attribute Selection Filter Zoom Clear

Project Regions Selection

Change Likelihood Rank

Row	Data ID	Label	Status	Change
143	245	21753	▲	
475	1236	29676	?	
490	1251	29743	?	
164	266	21774	?	
174	311	23282	?	
229	669	27400	?	
150	252	21760	?	
28	28	19998	?	

Contents

- 2D View #1
 - parcels_new.shp
 - 2007.img
 - Background
- 2D View #2
 - parcels_new.shp
 - 2008.img
 - Background

parcels_new.shp

Record	OBJECTID	PIN	OBJECTID_1	County_Cod
1235	29675	D25P1	24603 70	D2
1236	29676	D25P0	24545 70	D2
1237	29677	D25P1	24584 70	D2

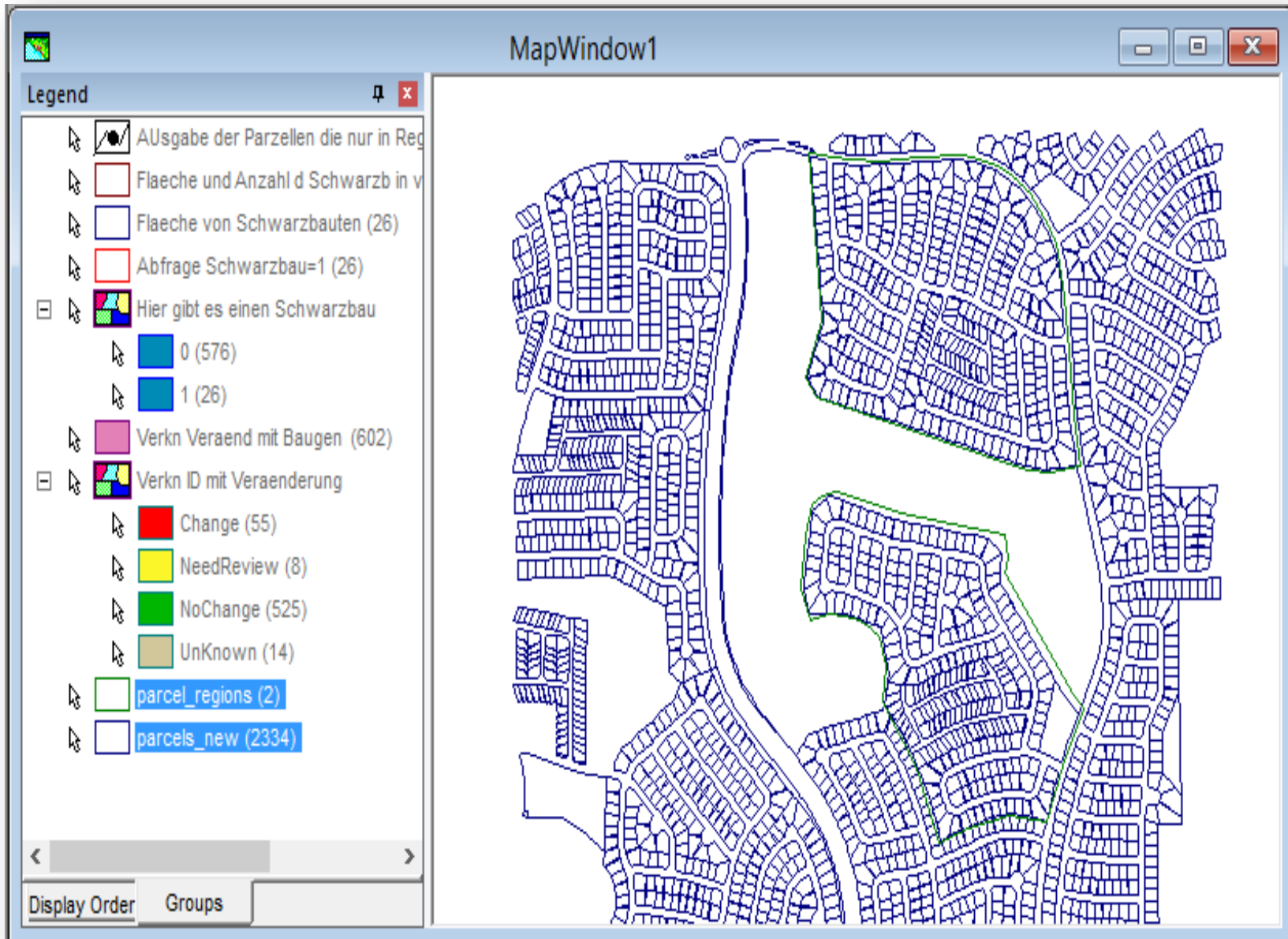
Region ID	Data ID	Label	Status	LastUpdatedDateTime	LastUpdatedBy	ChangeLikelihood
1	1	9645	NoChange	2014-11-12.10:10:51	rguggenmos	26.070900
2	2	9646	NoChange	2014-11-12.10:10:51	rguggenmos	19.016700
3	3	9647	NoChange	2014-11-12.10:22:59	rguggenmos	81.764300
4	4	9648	Change	2014-11-12.10:07:32	rguggenmos	199.715000
5	5	9649	NoChange	2014-11-12.10:10:51	rguggenmos	27.396100
6	6	9650	UnKnown	2014-11-07.10:57:45	rguggenmos	51.158700
7	7	9651	NoChange	2014-11-12.10:22:59	rguggenmos	79.438400
8	8	9652	NoChange	2014-11-12.10:10:51	rguggenmos	23.158600
9	9	9653	NoChange	2014-11-12.10:10:51	rguggenmos	43.385400
10	10	9654	NoChange	2014-11-12.10:22:59	rguggenmos	94.627700
11	11	9655	UnKnown	2014-11-07.10:57:46	rguggenmos	68.966500
12	12	9656	UnKnown	2014-11-07.10:57:46	rguggenmos	68.944200
13	13	9657	UnKnown	2014-11-07.10:57:46	rguggenmos	56.166300
14	14	9658	NoChange	2014-11-12.10:10:51	rguggenmos	22.620000
15	15	9659	NoChange	2014-11-12.10:22:59	rguggenmos	89.477000
16	16	9660	NoChange	2014-11-12.10:22:59	rguggenmos	91.937000
17	17	9661	NoChange	2014-11-12.10:10:51	rguggenmos	27.958300
18	18	9662	NoChange	2014-11-12.10:10:51	rguggenmos	31.954800
19	19	9663	NoChange	2014-11-12.10:22:59	rguggenmos	107.419000
20	20	9775	NoChange	2014-11-12.10:10:51	rguggenmos	38.052000
21	21	9776	NoChange	2014-11-12.10:10:51	rguggenmos	34.638200
22	22	9777	NoChange	2014-11-12.10:10:51	rguggenmos	22.775800
23	23	9778	UnKnown	2014-11-07.10:57:48	rguggenmos	51.444300
24	24	9779	NoChange	2014-11-12.10:10:51	rguggenmos	42.631700
25	25	9780	NoChange	2014-11-12.10:22:59	rguggenmos	167.931000
26	26	9906	NoChange	2014-11-12.10:10:51	rguggenmos	42.649900
27	27	9907	NoChange	2014-11-12.10:22:59	rguggenmos	108.032000
28	28	9908	NoChange	2014-11-12.10:22:59	rguggenmos	89.692000

0.00

Workflow im Detail

Teil 2 – Veränderungsanalyse mit GeoMedia

Zonal Change – Analyse



Zonal Change – Analyse

- Change / No Change / Need Review / Unknown aus dem Report

The screenshot displays two windows from a GIS application:

- MapWindow1:** Shows a map of a residential area with a street grid. The map is overlaid with colored polygons representing different zones and changes. A legend on the left lists the following layers:
 - AUsgabe der Parzellen die nur in Reg
 - Flaeche und Anzahl d Schwarzb in v
 - Flaeche von Schwarzbauten (26)
 - Abfrage Schwarzbau=1 (26)
 - Hier gibt es einen Schwarzbau
 - 0 (576)
 - 1 (26)
 - Verkn Veraend mit Baugen (602)
 - Verkn ID mit Veraenderung
 - Change (55)
 - NeedReview (8)
 - NoChange (525)
 - UnKnown (14)
 - parcel_regions (2)
 - parcels_new (2334)
- DataWindow1:** Shows a table titled 'Verkn ID mit Veraenderung' with the following data:

Object_ID	Veraenderung
9645	NoChange
9646	NoChange
9647	NoChange
9648	Change
9649	NoChange
9650	NoChange
9651	NoChange
9652	NoChange
9653	NoChange
9654	NoChange
9655	NoChange
9656	NoChange
9657	NoChange
9658	NoChange
9659	NoChange
9660	NoChange
9661	NoChange
9662	NoChange

Zonal Change – Analyse

- Verknüpfung mit der Information zur Baugenehmigung

The screenshot displays a GIS application interface with two main windows: MapWindow1 and DataWindow3.

MapWindow1 Legend:

- AUsgabe der Parzellen die nur in Reg...
- Flaeche und Anzahl d Schwarzb in v
- Flaeche von Schwarzbauten (26)
- Abfrage Schwarzbau=1 (26)
- Hier gibt es einen Schwarzbau
 - 0 (576)
 - 1 (26)
- Verkn Veraend mit Baugen (602)**
- Verkn ID mit Veraenderung
 - Change (55)
 - NeedReview (8)
 - NoChange (525)
 - UnKnown (14)
- parcel_regions (2)
- parcels_new (2334)

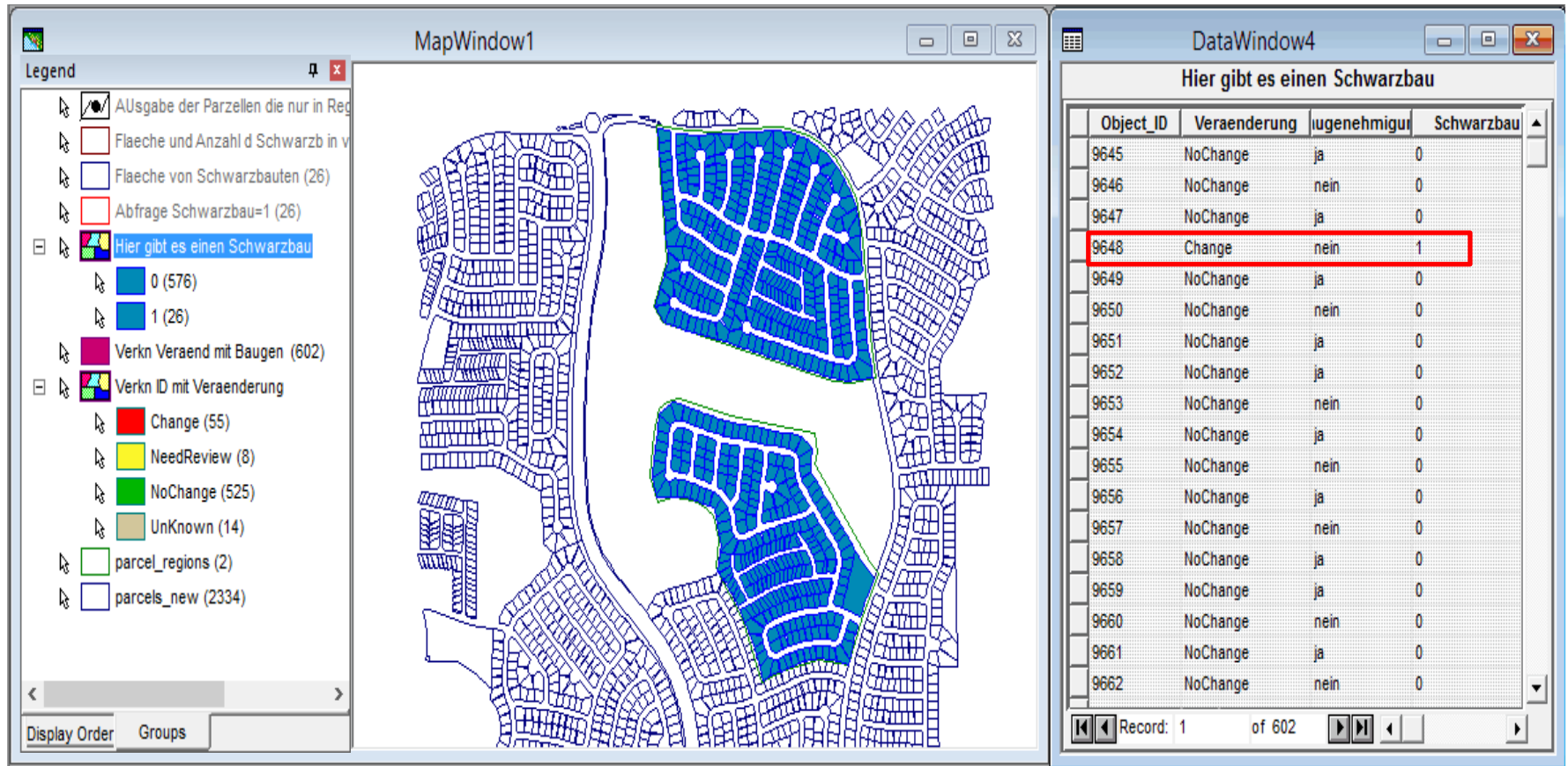
DataWindow3: Verkn Veraend mit Baugen

Object_ID	Veraenderung	Baugenehmigung
9645	NoChange	ja
9646	NoChange	nein
9647	NoChange	ja
9648	Change	nein
9649	NoChange	ja
9650	NoChange	nein
9651	NoChange	ja
9652	NoChange	ja
9653	NoChange	nein
9654	NoChange	ja
9655	NoChange	nein
9656	NoChange	ja
9657	NoChange	nein
9658	NoChange	ja
9659	NoChange	ja
9660	NoChange	nein
9661	NoChange	ja
9662	NoChange	nein

Record: 1 of 602

Zonal Change – Analyse

- Legaler Bau oder Schwarzbau ?



Zonal Change – Analyse

- Abfragen der Größe
- Ermittlung der Anzahl
- ...
- Hinterlegen von Gebühren
- Verknüpfung mit Adressen
- USW.

Object_ID	Veraenderung	Baugenehmigung	Schwarzbau	Area
9648	Change	nein	1	791.4
10942	Change	nein	1	677.3
11761	Change	nein	1	1 145.0
13270	Change	nein	1	911.3
13275	Change	nein	1	1 201.0
13282	Change	nein	1	742.5
13389	Change	nein	1	1 134.2
13407	Change	nein	1	715.4
13409	Change	nein	1	934.1
17624	Change	nein	1	1 069.8
19382	Change	nein	1	973.2
19386	Change	nein	1	1 637.2
19535	Change	nein	1	824.9
19538	Change	nein	1	988.8
19657	Change	nein	1	1 025.8
19659	Change	nein	1	591.8
19682	Change	nein	1	792.1
19741	Change	nein	1	554.6
21853	Change	nein	1	362.9
24930	Change	nein	1	739.9
25101	Change	nein	1	1 113.6
25112	Change	nein	1	858.3
25117	Change	nein	1	737.2
25267	Change	nein	1	1 053.1
25310	Change	nein	1	1 086.1

AREA	PERIMETER	ID	Region	Flaeche	Anzahl
3119813.937	7081.606	1	1	4079.0113039292	4
2517253.747	6997.944	14	2	19425.7127061867	22

Record: 1 of 3

Veränderung der Veränderung ... und jetzt?

Verknüpfung über den Report

The screenshot displays the ERDAS IMAGINE 2015 interface. On the left, the 'Change Likelihood Rank' table shows a list of regions with their IDs, labels, and status changes. The main window shows a map with a green polygon highlighting a specific region. Below the map, a data table lists region details:

Region ID	Data ID	Label	Status	LastUpdateDateTime	LastUpdateBy	Chan.
1	1	9465	NoChange	2014-11-12 10:10:51	201408080	26,0709
1	2	9466	NoChange	2014-11-12 10:10:51	201408080	19,016700
1	3	9467	NoChange	2014-11-12 10:22:59	201408080	83,764300
1	4	9468	Change	2014-11-12 10:10:51	201408080	199,715000
1	5	9469	NoChange	2014-11-12 10:10:51	201408080	27,396100
1	6	9450	ChkDown	2014-11-07 10:57:45	201408080	51,158700
1	7	9451	NoChange	2014-11-12 10:22:59	201408080	79,438400
1	8	9452	NoChange	2014-11-12 10:10:51	201408080	23,158600
1	9	9453	NoChange	2014-11-12 10:10:51	201408080	43,385400
1	10	9454	NoChange	2014-11-12 10:22:59	201408080	94,427700
1	11	9455	ChkDown	2014-11-07 10:57:44	201408080	48,946500
1	12	9456	ChkDown	2014-11-07 10:57:44	201408080	48,946500
1	13	9457	ChkDown	2014-11-07 10:57:44	201408080	54,166300
1	14	9458	NoChange	2014-11-12 10:10:51	201408080	22,420000
1	15	9459	NoChange	2014-11-12 10:22:59	201408080	89,477000
1	16	9460	NoChange	2014-11-12 10:22:59	201408080	91,937000
1	17	9461	NoChange	2014-11-12 10:10:51	201408080	27,958300
1	18	9462	NoChange	2014-11-12 10:10:51	201408080	31,954800
1	19	9463	NoChange	2014-11-12 10:22:59	201408080	107,419000
1	20	9776	NoChange	2014-11-12 10:10:51	201408080	38,430200
1	21	9776	NoChange	2014-11-12 10:10:51	201408080	34,430200
1	22	9777	NoChange	2014-11-12 10:10:51	201408080	22,778500
1	23	9778	NoChange	2014-11-07 10:57:46	201408080	51,446300
1	24	9779	NoChange	2014-11-12 10:10:51	201408080	42,431700
1	25	9780	NoChange	2014-11-12 10:22:59	201408080	167,931000
1	26	9304	NoChange	2014-11-12 10:10:51	201408080	42,449900
1	27	9307	NoChange	2014-11-12 10:22:59	201408080	106,030000



Rasterverarbeitung mit
ERDAS IMAGINE



Vektorverarbeitung mit
GeoMedia

Datenaustausch



Rasterverarbeitung mit
ERDAS IMAGINE



Vektorverarbeitung mit
GeoMedia



Datenmanagement mit
ERDAS Apollo

Vielen Dank !



Tatjana Koukal

Projekte & Entwicklung

Telefon 089 – 89 43 43 22
Fax 089 – 89 43 43 99
E-Mail t.koukal@geosystems.de

GEOSYSTEMS GmbH
Riesstraße 10
82110 Germering
Germany

www.geosystems.de