



JIGUSOFT

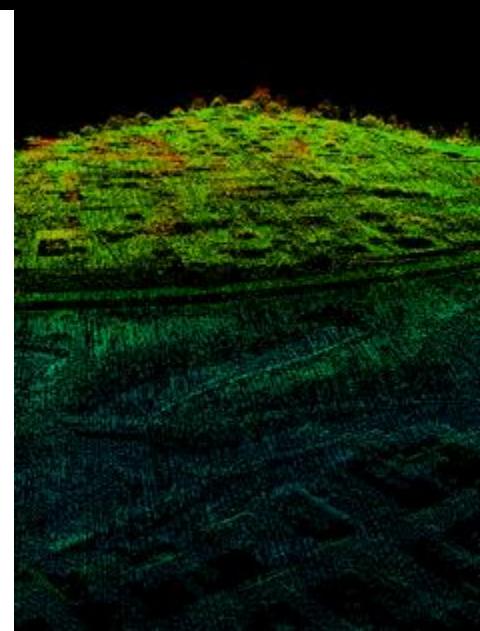
INTERGRAPH®

erdas
an Intergraph® brand

ERDAS 2012 공간솔루션 신기술 세미나

ERDAS 2012 new technology seminar

강 민 수



ERDAS 솔루션 리뷰

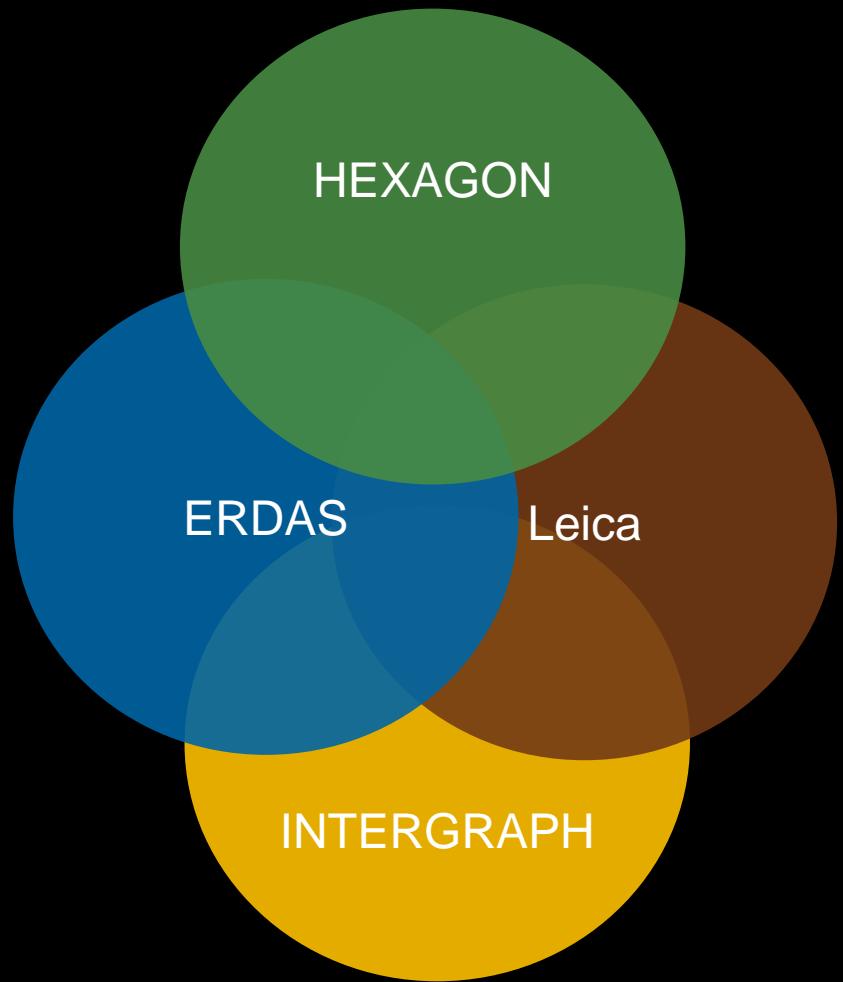
- ERDAS사의 통합
- 소프트웨어 히스토리
- 업무영역별 기능향상
- 제품모듈별 기능향상

ERDAS R&D 리뷰

- 데이터 포맷 및 프로토콜
- 변화된 기술 (하이라이트)

ERDAS 마케팅 리뷰

- 본사 사이트
- 한국 사이트



ERDAS Solution Review

1800s - 1980



1920 – Wild founded in Heerbrugg, Switzerland



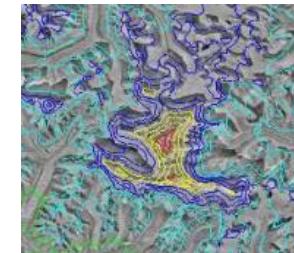
1819 – Kern founded in Aarua, Switzerland



Analog technologies were used to make hardcopy maps



1969 – Intergraph founded as M&S Computing



1978 – ERDAS, Inc. founded



Measurement Technologies were perfected from companies like Leica

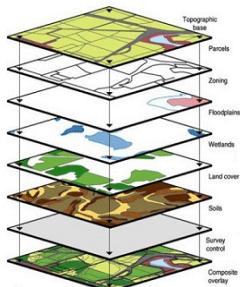
Birth of GIS; Digital Mapping Generation

기하에서 공간으로(2세대)



1980 – 1990

1980 – M&S
Consulting changes
name to Intergraph

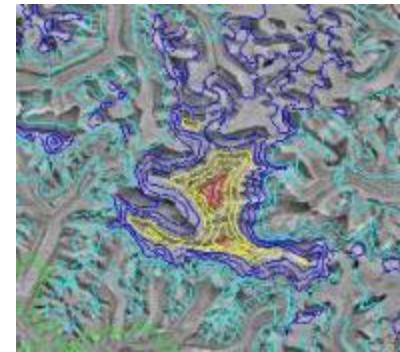


The '2D Mapping'
Generation



Digital Photogrammetry

Commercialization of
Remote Sensing Satellites



The 2-D Mapping Generation

기하에서 공간으로(3세대)

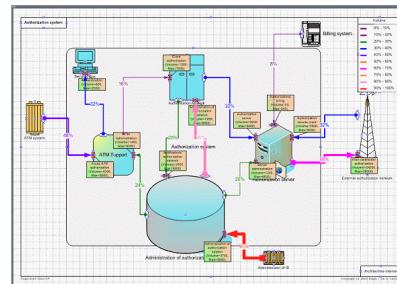


1991 - 2000

1999 – Z/I Imaging GmbH begins as joint venture between Carl Zeiss and the Intergraph photogrammetry division



Relational databases to share information within an organization



2000 – Intergraph exits the hardware business and restructures around vertically-focused divisions for software, systems integration and professional services



The Internet Age;
Beginning of the 3-D Generation

Broadening of market from professional users to prosumer and consumers of geospatial information



기하에서 공간으로(4세대)



2001 - 2010

2001 – Leica Geosystems acquires ERDAS, Inc. & LH Systems; rebrands entity as Leica Geosystems GIS & Mapping (later LGGI)



2002 – Carl Zeiss' shares of Z/I Imaging are sold to Intergraph



2005 – Hexagon purchases Leica Geosystems; maintains Leica identity



2006 – Intergraph is purchased by private investors



2007 – LGGI acquires Acquis, Inc., ER Mapper, & IONIC Software

The Hexagon Advantage



Information Cloud



2010 – Hexagon purchases Intergraph

2008 – LGGI rebrands itself as ERDAS Inc.



Mobile, 'On-Demand' Generation
"I want it now!"

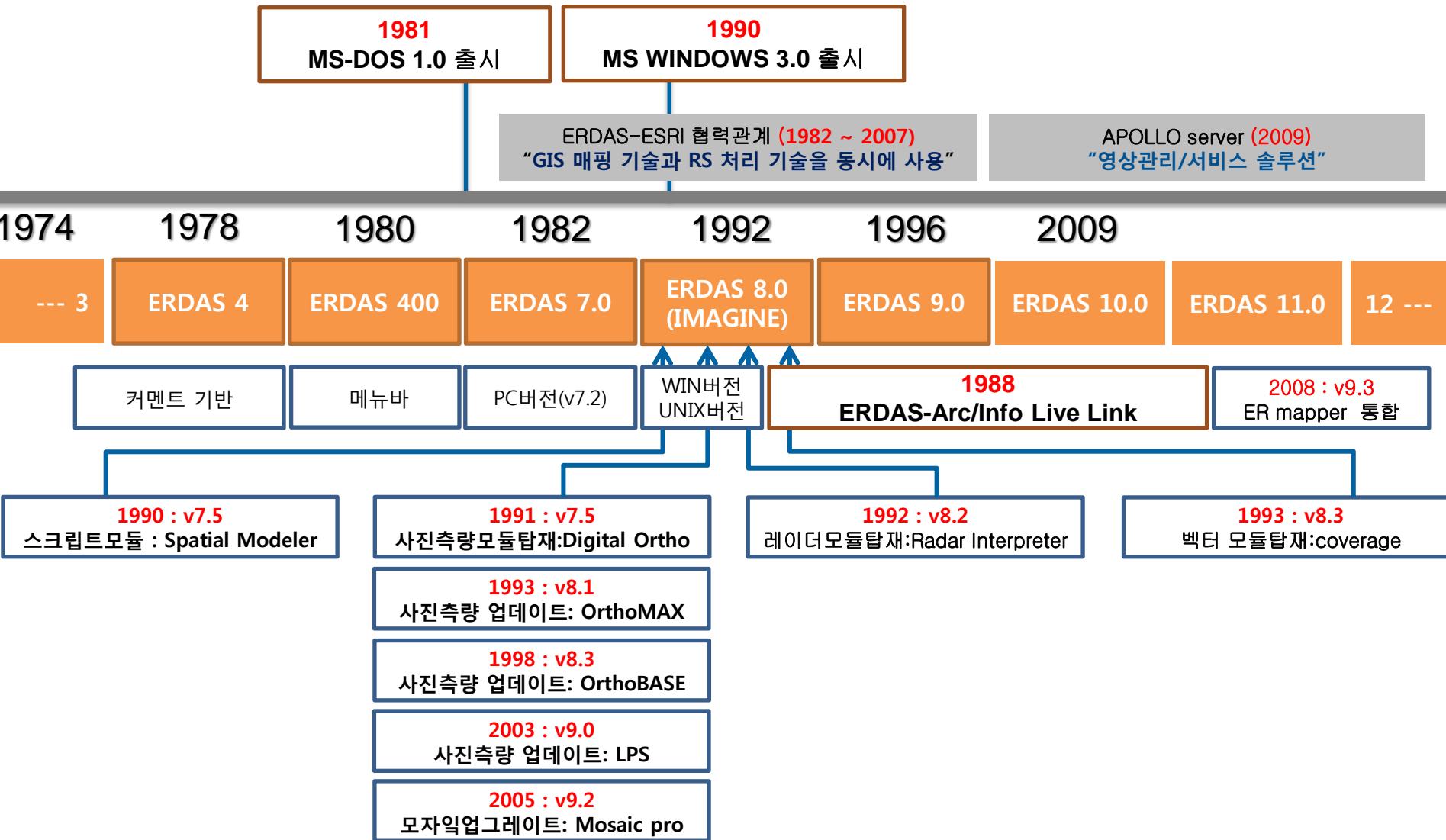


Instant Messenger & Online Social Media



Synthesis of IT, Internet, Business Systems and Geospatial Technology to create true Decision Support Systems

소프트웨어에서 솔루션으로 (1974~2009)



소프트웨어에서 솔루션으로 (2010~2012)



2010

ERDAS-GEOMEDIA Live Link

OGC 표준적용 (2009)

“데스크탑과 서버에서 표준표준 완벽지원”

ERDAS, INTERGRAPH = HEXAGON (2010)

“GIS 매핑 기술과 RS 처리 기술을 완벽히 동시 사용”

2010

ERDAS 10

리본 인터페이스 채용
(클래식 인터페이스 공존)

포인트추출 모듈 :eATE 탑재 (v10.1)

모자이크 기능 대폭 향상

ER mapper 알고리즘 적용

ECW/Jpeg2000 일기/쓰기

WPS(Server-side Geo-processing) 지원

2011

ERDAS 11

ERDAS-GEOMEDIA 와 Live Link 연계

지형 처리강화 : Terrain Pref

병렬 프로세싱 및 멀티 코어 강화

향상된 투명도 지원 (APOLLO)

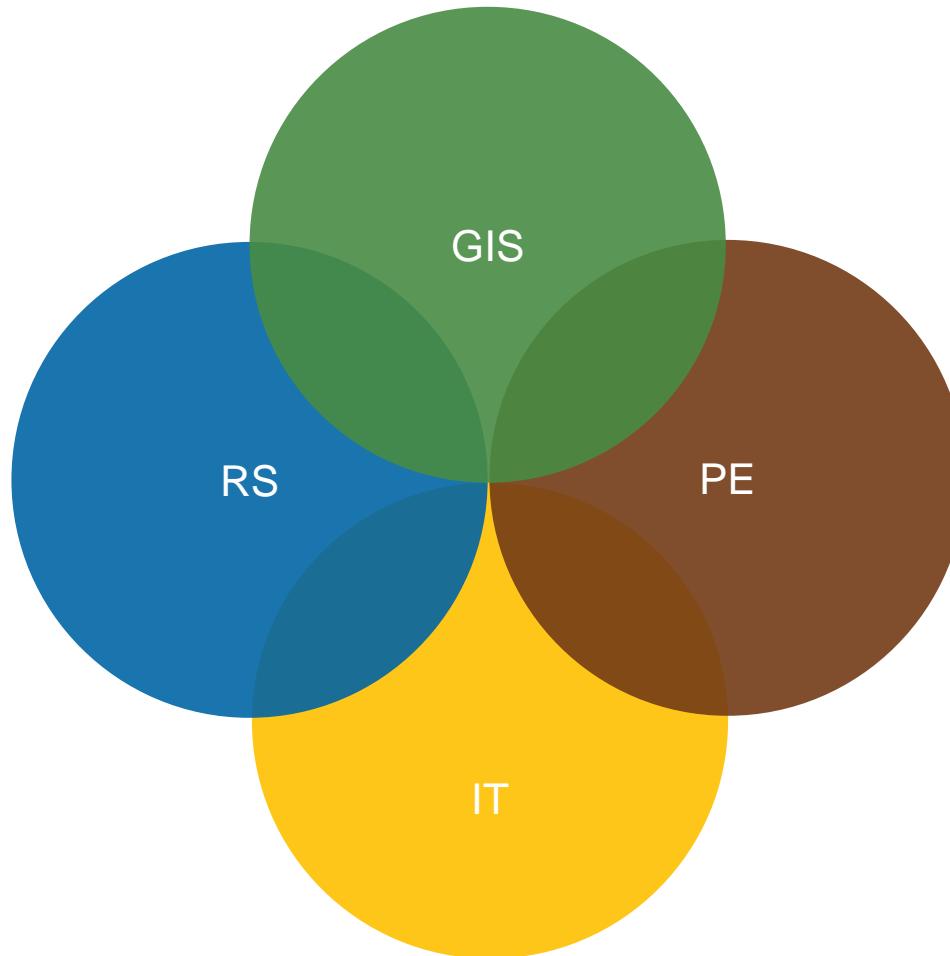
그래픽 도구 강화 (APOLLO)

Web Map Tiling Service (WMTS) 지원

2012

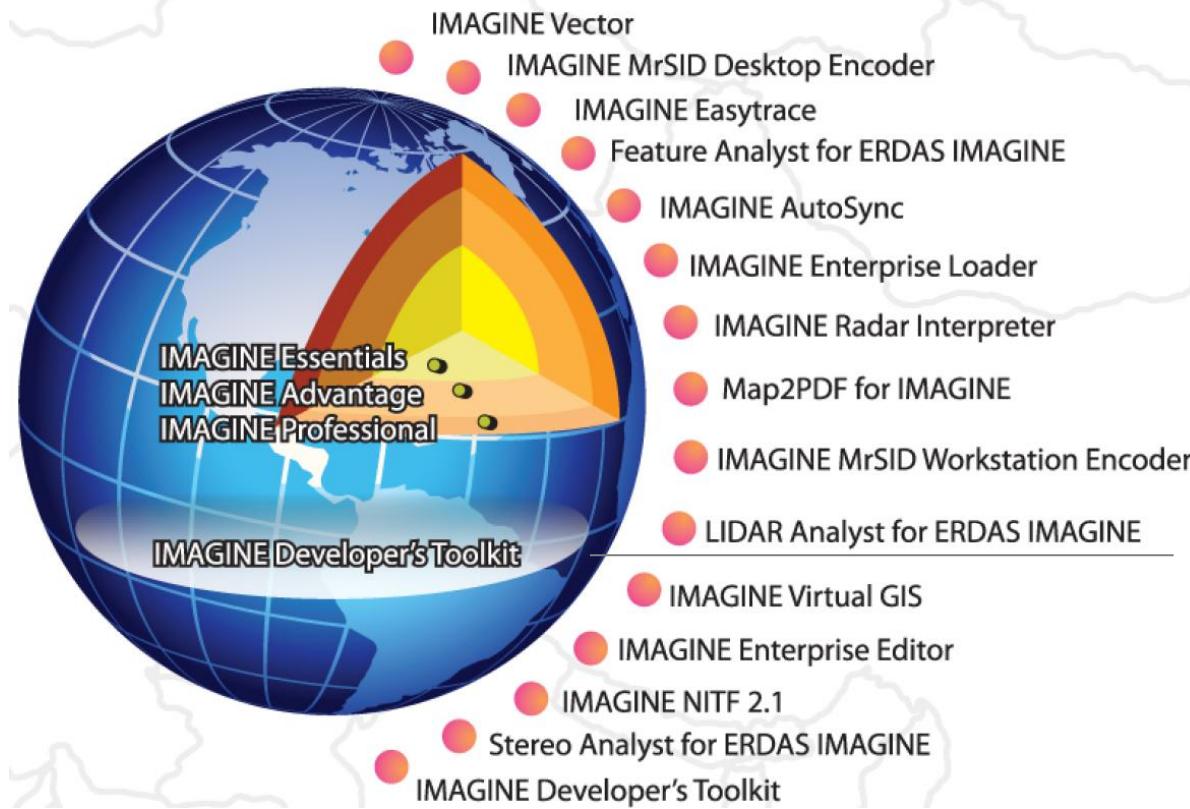
ERDAS 12

?



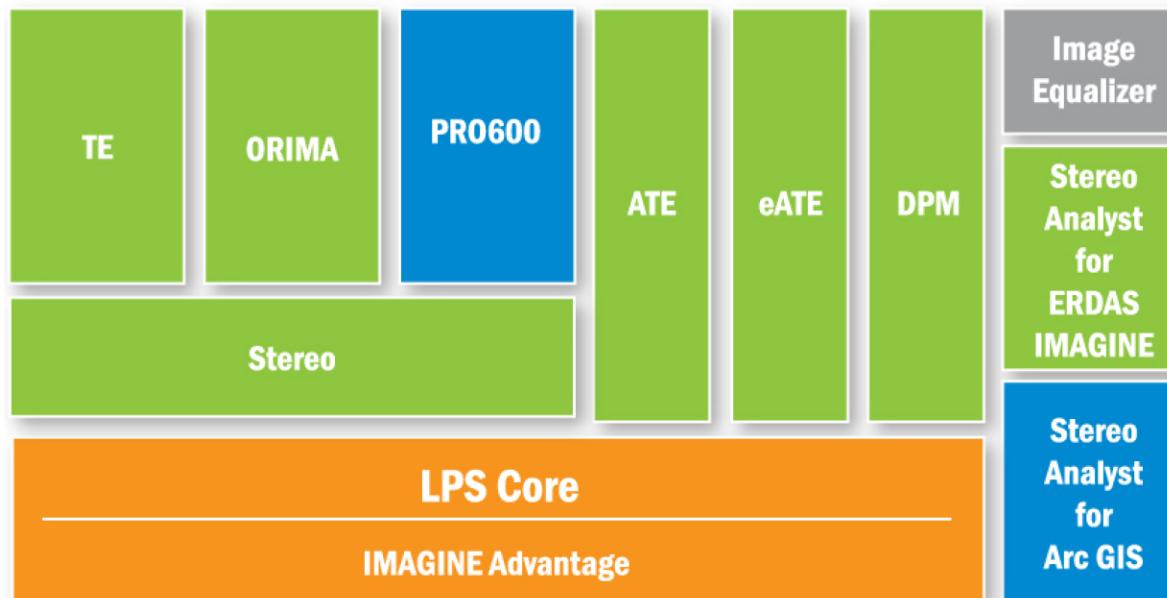
IMAGINE - 다이나믹 공간정보처리 솔루션

IMAGINE Suite 구성



L P S - 완전한 사진측량 도구

LPS Suite 구성



LPS Core

Core Add-on Modules

Stand-alone

Interoperable

APOLLO - 데이터 조직화, 관리 & 공유

APOLLO Suite 구성





2011~2012 업무영역별 기능 향상



기본기능	화면보기(비교, 밴드별. 링크. 동적,레이어, 레전드), 정보확인, 기하측정, 배치, 모델러, 필터링
영상관리	입출력, 카탈로깅, 메타생성, 프로젝트, 리포팅, 영상융합, 영상추출
방사보정	히스토그램 균등화, 히스토그램 매치, 스트레치, 노이즈 조정, 색체계 변환
기하보정	영상자르기, 영상이동, 영상전환, 해상도조정, 스캐일링, 지오레페리싱, 좌표변환, 영상보간
영상제작	내부표정, 상호표정, 지상기준점 등록, 항공삼각측량, 영상집성, 모자이크
지형처리	라이다(LAS) 자료 처리, 지형생성, 지형편집, 지형보간, 등고선 생성
지형분석	가시선, 주향, 경사, 고도 분석, 라이다(LAS) 분석
영상분류	주성분 추출, 무감독 분류, 감독 분류, 화소이하 분류, 객체기반 분류
영상판독	에지매칭, 대기보정, 변화탐지, 타겟감지, 피쳐추출, 지식기반분석
벡터처리	CAD/GIS 입출력, 속성정보편집, 변환기능, 반자동 벡터리이징
3차원처리	DEM,IMAGE,SHAPE,3DS,CAD 를 이용한 가상현상 구현, 네비게이션 설정, 3차원 동영상 제작
지도제작	화면심볼처리, 심볼등록, 축척에 따른 출력, A0이상 고해상도 지원, 3차원(여색입체시) 출력
연계작업	OGC 표준연계, ArcGIS GDB 연계, DBMS 연계, 구글어스 연계

아키텍쳐

- Pull based processing
- WPS aware from the beginning
- Support Raster, Vector, equally well
- Graphical input of parameters
- **User Extensible to allow new types and operations to be added**
- Access to all IMAGINE processing capability
- Point Cloud(LAS) support

사용자 편의

- A modern GUI integrated with the IMAGINE Ribbon
- Viewing of results on the fly
- Publish to WPS with an auto created UI
- Report problem location as well as progress
- **Flow control (branching, Looping)**

접근 환경

- Accessible through scripting APIs such as Python, VB, Java, etc)
- Publishable to APOLLO WPS
- **Engine should run on Linux**
- Accessible as a C++ API for programmers

성능 향상

- Batchable and distributable
- Able to use GPUs as computation engines
- Support multithreading and multiprocess

래스터 처리

- Able to operate at the single pixel level
- Incorporate GeoMedia GRID surface and path operations
- Fully handle NODATA in all operators
- Better control over created output properties such as pyramid layers, etc.
- Get and set image metadata values, for example access the acquisition date and time
- Propagate metadata through operations

벡터 처리

- Support vector as a proper type without forcing rasterizing
- Incorporate GeoMedia Warehouse and Pipe operations to support true vector operations
- Improve performance of rasterization where needed.

■ New Spatial Modeler

- GeoMedia Vector Operators
- GeoMedia GRID Operators
- Python scripting
- WPS

■ Point Cloud Suite

- 2D, 3D and Profile views
- Editing
- File Operators

■ LPS in the Ribbon

- Improved workflow

■ Radar Workstation

- Ship tracking
- Flood Mapping
- On-the-fly Georeferencing

■ New Segmentation

- Compare to eCognition

■ Indices

- Dozens of new Indices all launch in the Modeler

■ New look and capabilities

- Measure, swipe, style, content view, preferences, file chooser and batch tool

ERDAS R&D Review



ECW : Enhanced(=>ERDAS) Compressed Wavelet

ERDAS Approach,



Raw imagery + ECW Mosaic

Competitor solution,

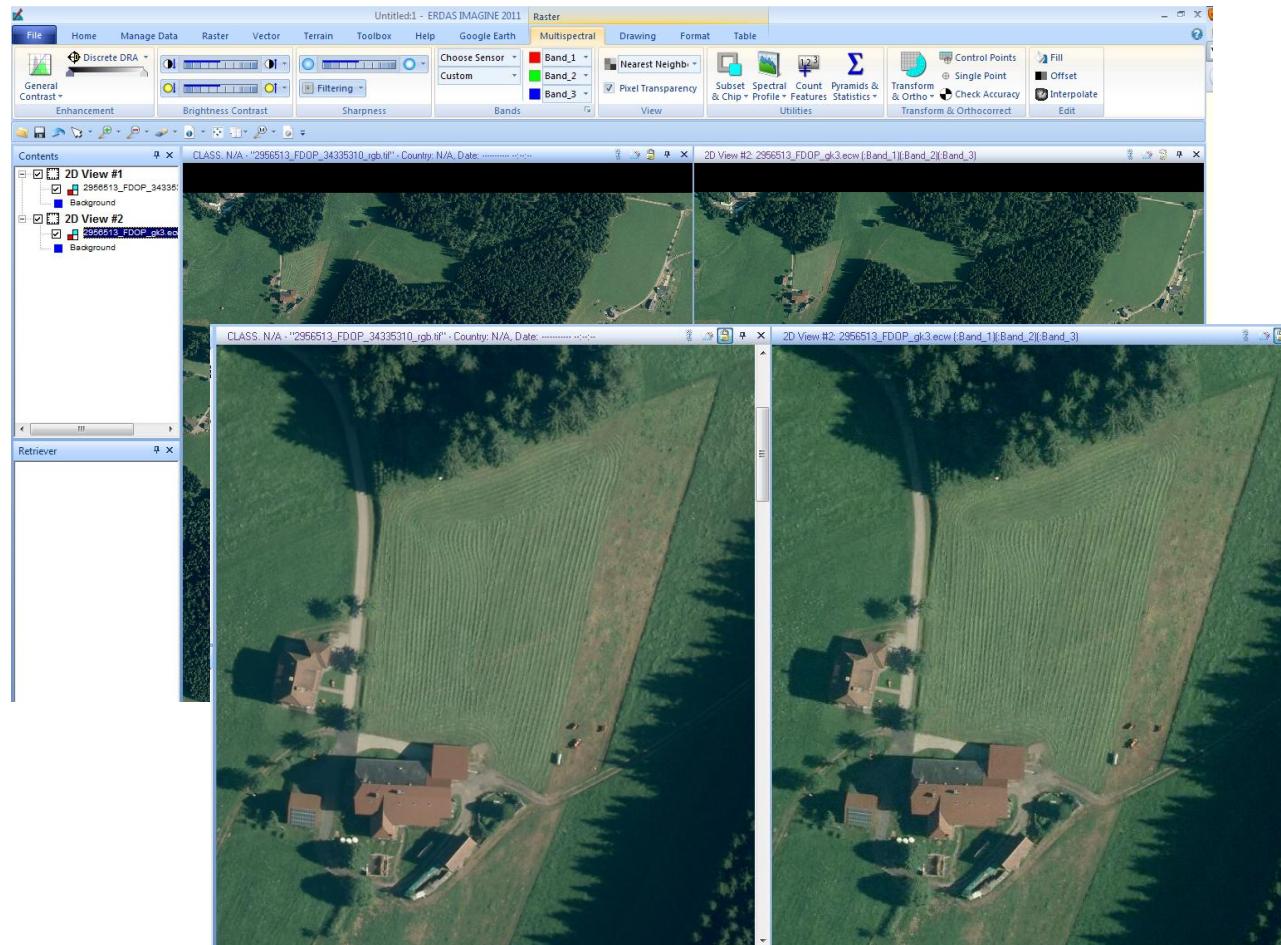


Raw imagery + image tiles + tile pyramids + mosaic overviews + cache



“1 Layer”

2011~2012 포맷 및 프로토콜 특징 (2/5)



V2 → V3

- 3 - 10x faster
- 20-35% smaller
- Multi-threaded
- Supports 16-bit data

ECW v3 포맷 벤치마크 – ADS80 data



- 12,236 x 12,196px (149 megapixel)
- 16-bit lossy compression

Input	Type	Target Ratio	Avg CPU	Compression Time (sec)	Delta Time	Throughput (MB/s)
16bit lossless JP2	16bit ECW v3	20	75%	41	3.61x	20.83
16bit lossless JP2	16bit JP2	20	20%	148		5.77

- 8-bit lossy compression

Input	Type	Target Ratio	Avg CPU	Compression Time (sec)	Delta Time	Delta File Size	Throughput (MB/s)
8bit JP2	ECW v3	20	70%	25	1.56	1.34	17.08
8bit JP2	ECW v2	20	22%	39			10.95
8bit IMG	ECW v3	20	85%	9.5	4.11		44.94



Results

- 16-bit v3 ECW creation is 3.6x faster than creating 16bit JP2
- 8-bit v3 ECW creation is
 - 1.5x faster reading input from JP2
 - 4x faster reading input from IMG
- 8-bit v3 ECW creates 34% smaller files

- 13,171 x 13,173px (187 megapixel)

Input	Type	Ratio	Avg CPU	Compression Time (sec)	Delta Time	Delta File Size	Throughput (MB/s)
8bit TIF	ECW v3	20	55%	14	3.57	1.09	38.15
8bit TIF	ECW v2	20	16%	50			10.68
8bit IMG	MrSID MG2	20	13%	86	0.58		6.21



Results

- 8-bit v3 ECW creation is
 - 3.5x faster than v2 ECW
 - 6.2x faster than MrSID MG2
- 8-bit v3 ECW file size is 9% smaller

- 50,000 x 50,000px (2,500 Megapixel)

Input	Type	Ratio	Avg CPU	Compression Time (sec)	Delta Time	Delta File Size	Throughput (MB/s)
8bit ECW	ECW v3	20	91%	115	3.29	1.28	62.20
8bit ECW	ECW v2	20	15%	378			



Results

- 8-bit v3 ECW creation is 3.2x faster than v2

ECWP

Streaming protocol

Distributed decompression

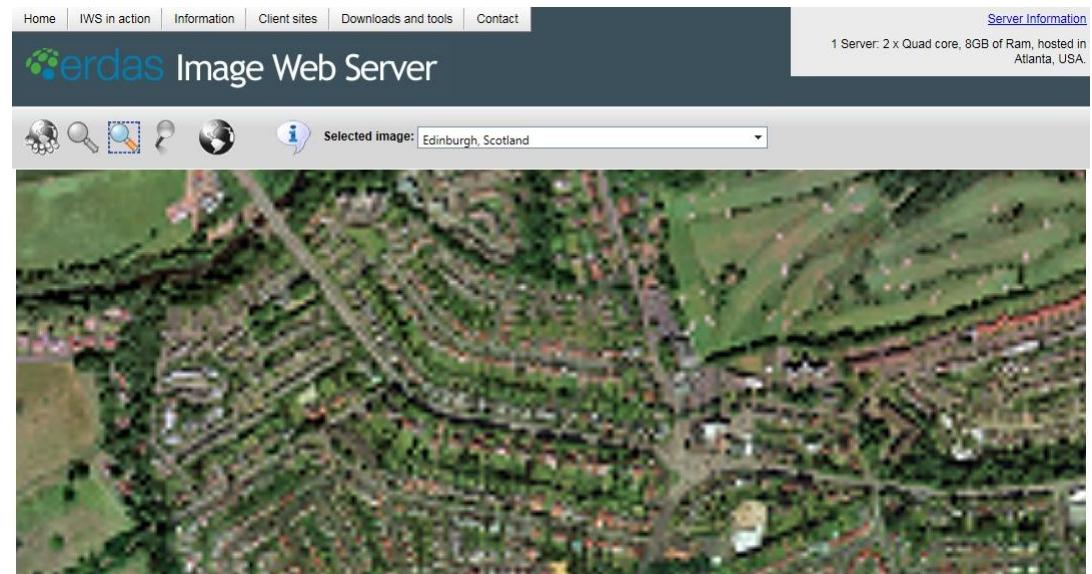
- Client decodes
- Client transforms, reprojects
- Client caches

Server dependency

Network usage

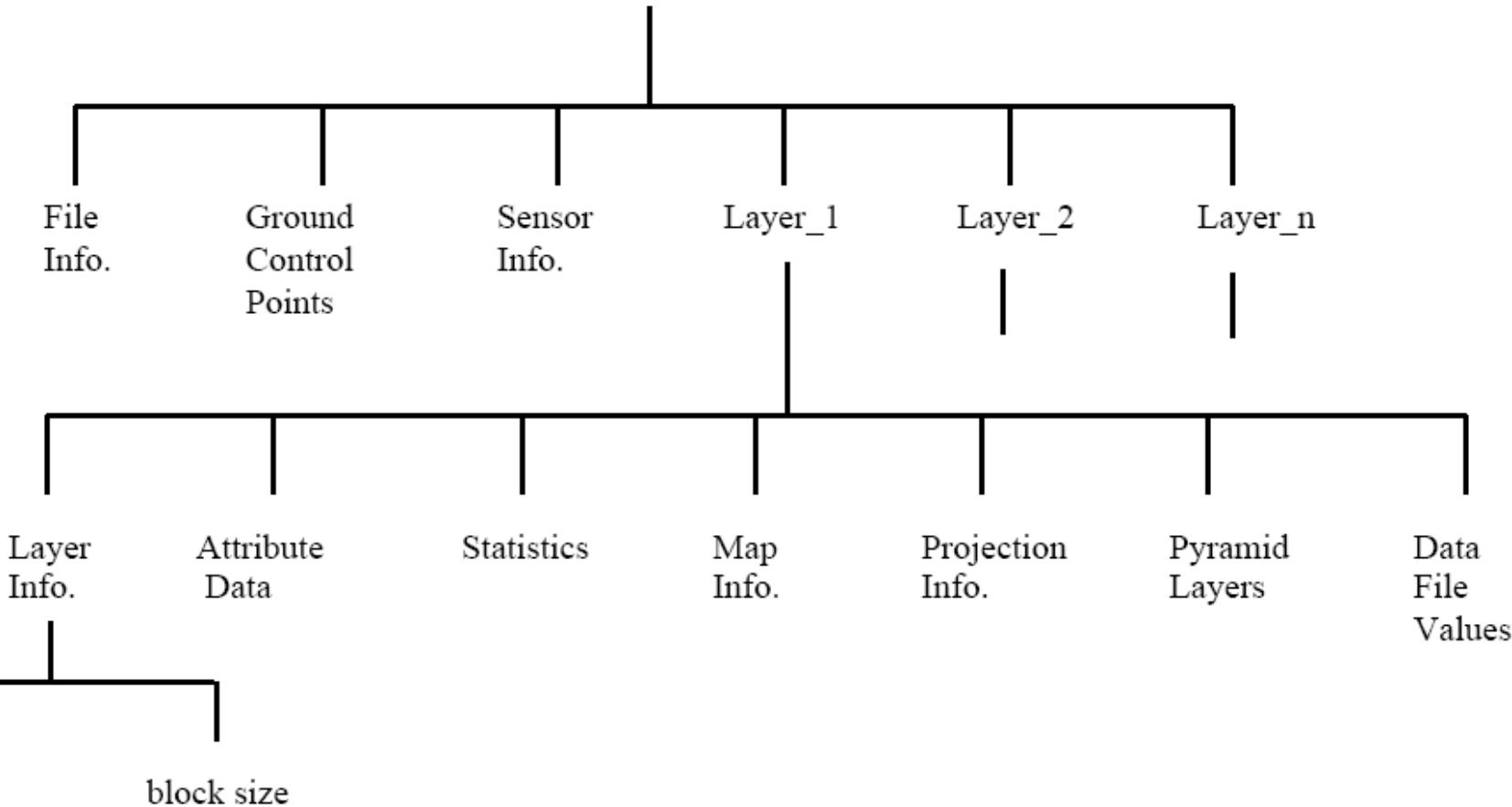
ECW and JP2 format compatible

Reduces latency, improves draw performance



IMG

.img file



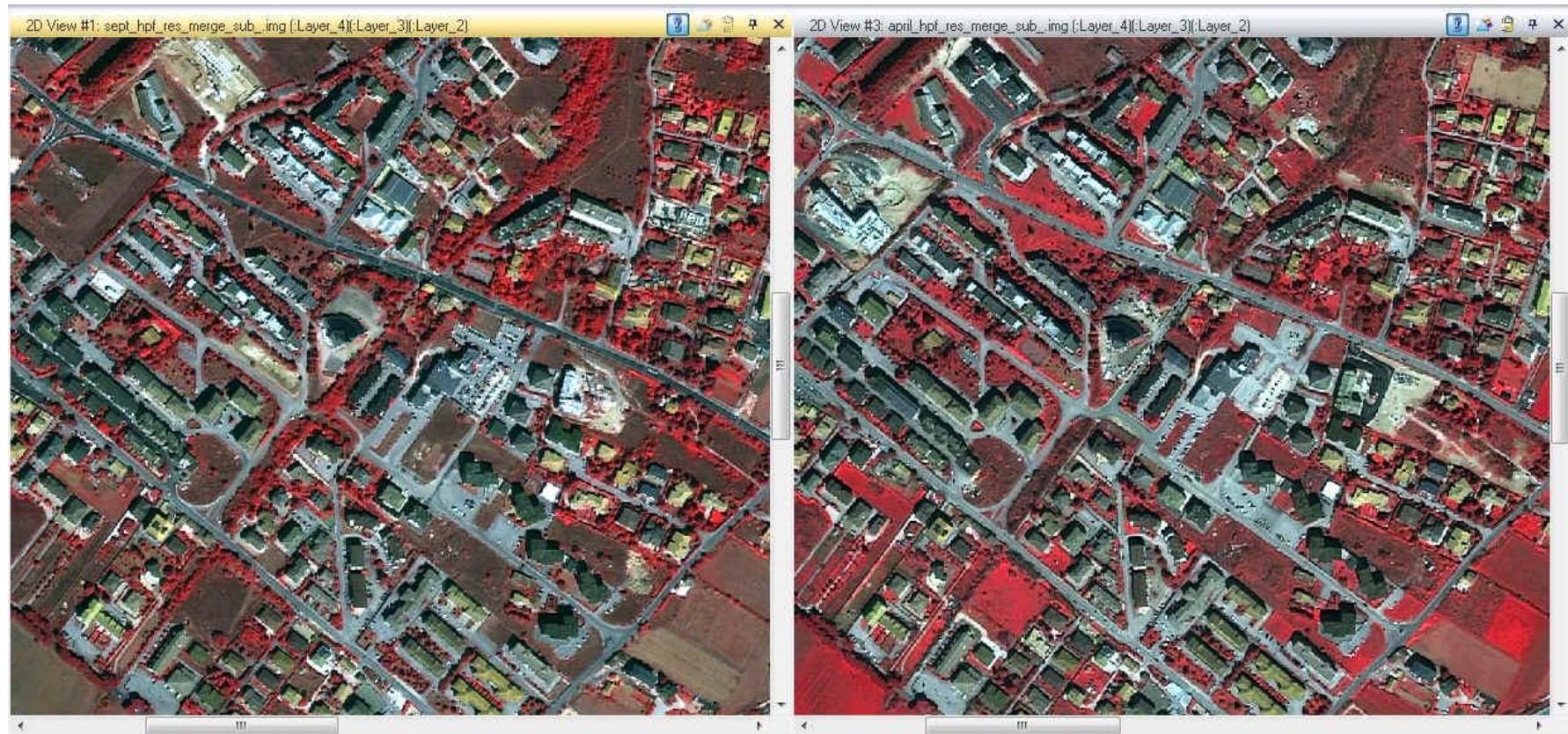
Change Detection - Approaches

- Pixel-based Approach
 - Normalized image difference
 - ERDAS IMAGINE DeltaCue
 - Discriminant Function Change (DFC)
- Classification-based Approach
 - Classify both images using same classification scheme
 - Map pixels that are labeled as different classes
 - Can differentiate “from class to class”
- Object-based Approach
 - Shape and context can be exploited
 - Temporally directional (additive vs. subtractive)
 - Reduce false positives with object matching

객체기반 변화탐지(2/3)



Quickbird, 4 band, pan sharpened (09/2006, 04/2009)



Objective – Additive Change

- Vector Operators: Generalize, Convex Hull, Smooth



WV-2 Exploitation Workflow

■ Terrain Extraction

- ERDAS enhanced Automatic Terrain Extraction (eATE)
- 0.5 meter panchromatic image stereo pair
- Las point cloud converted to raster DEM

■ Pan Sharpening

- Hyperspherical Color Space (HCS) resolution merge
- 0.5 meter panchromatic image and 2.0 meter multispectral (8 bands)
- 0.5 meter, 8 band multispectral image output

■ Feature Extraction

- IMAGINE Objective
- Input both pan sharpened multispectral image and raster DEM
- Objects classified based on spectral characteristics and delta height

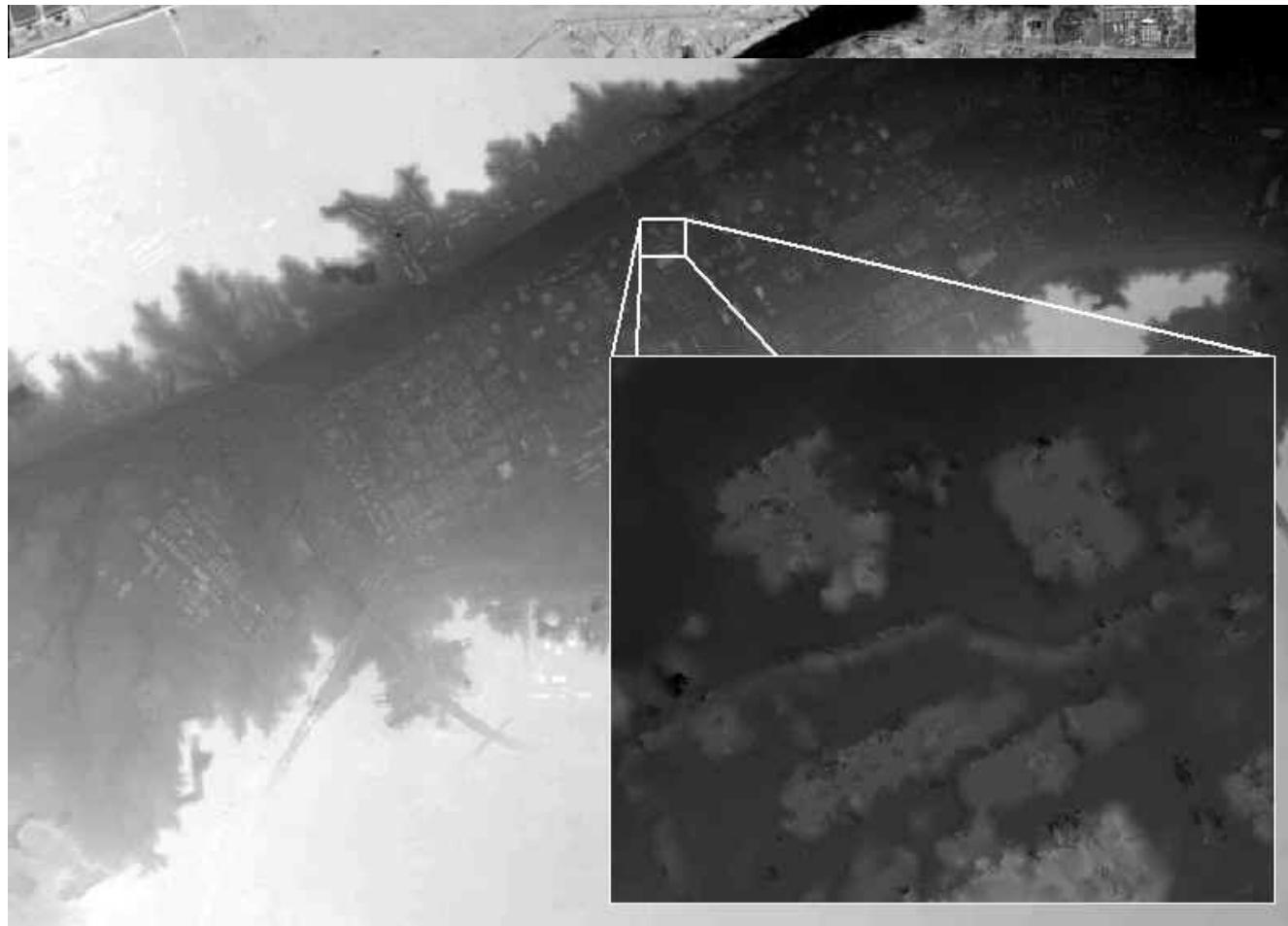
WV-2 Terrain Extraction

- Panchromatic stereo pair



WV-2 Terrain Extraction

- eATE Extracted DEM



WV-2 Pan Sharpening

- 2.0 Meter, 8 Band Multispectral Image (4,3,2)



WV-2 Pan Sharpening

- 0.5 Meter, 8 Band Pan Sharpened Multispectral Image



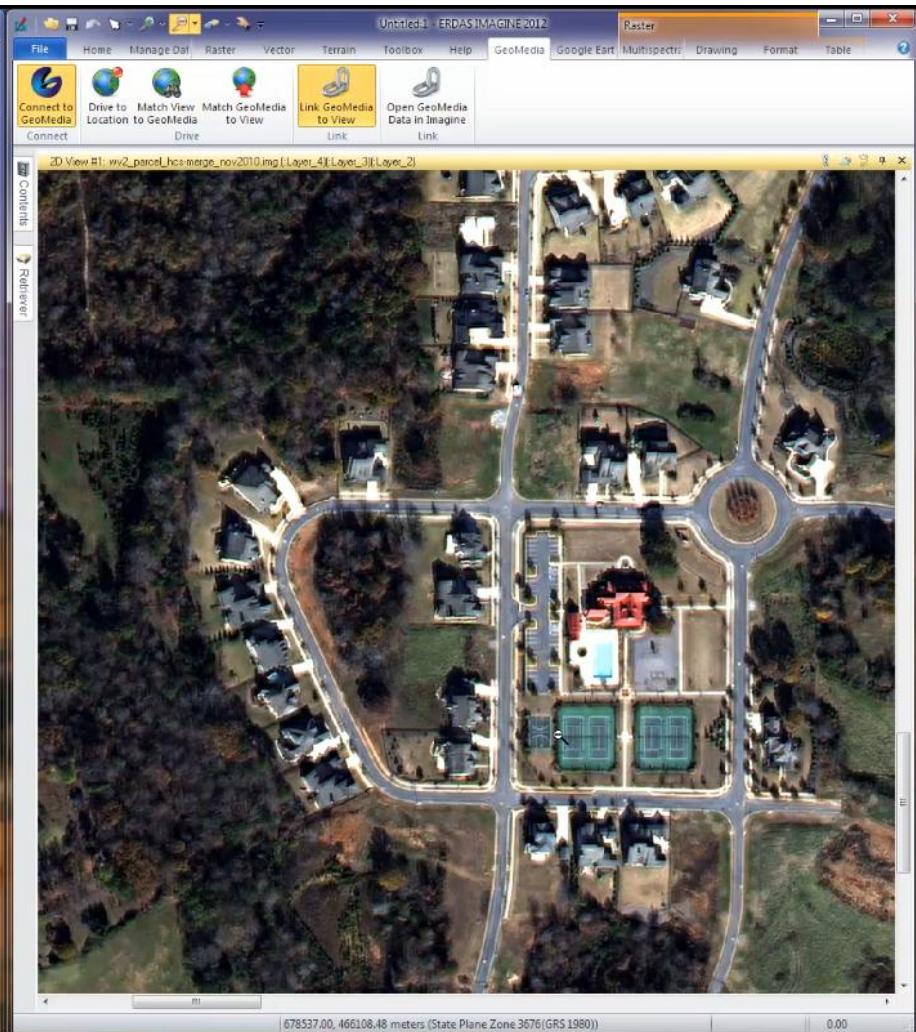
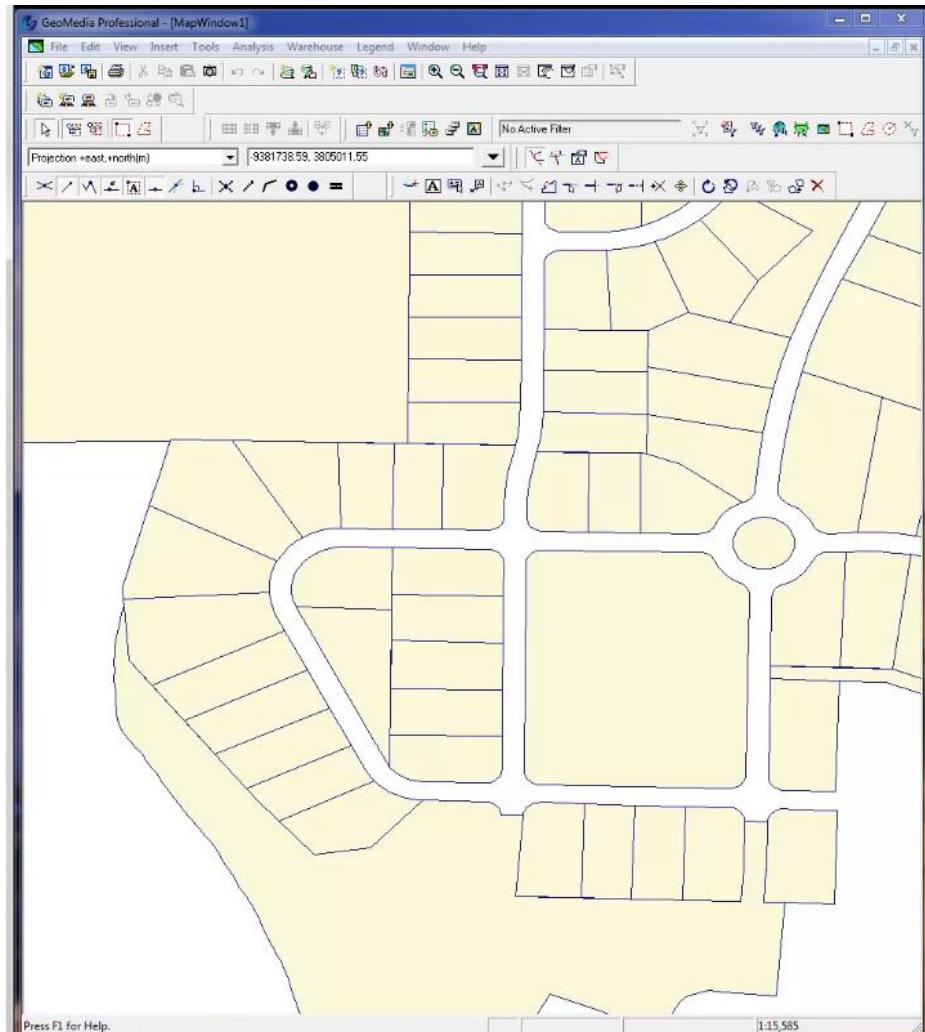
WV-2 Feature Extraction - Objective



GeoMedia 와 연계

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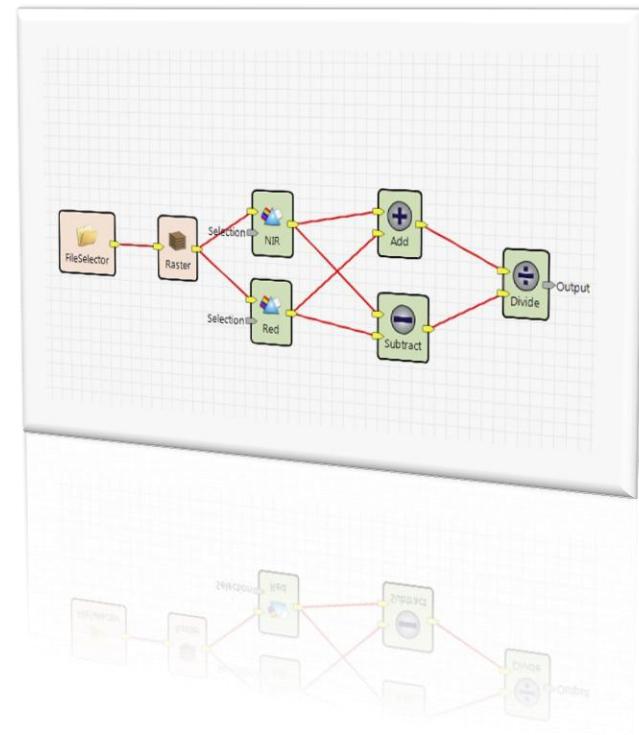


통합된 뷰어 플랫폼

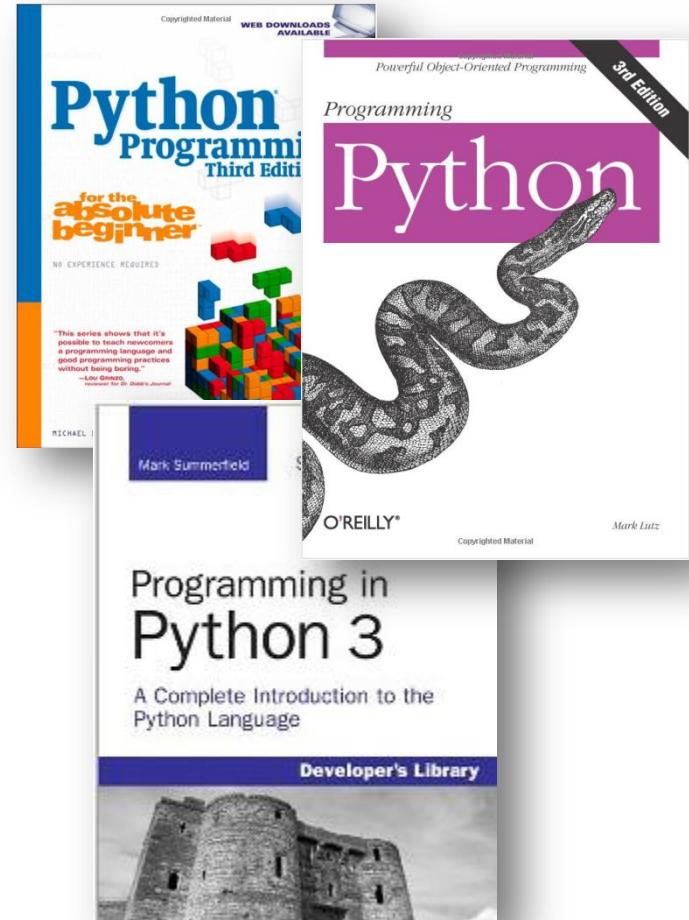
- 2D, 3D, stereo, video,
- Raster, Terrain, Vector, Annotation data,
- Database, network (WMS, ECWP streams)

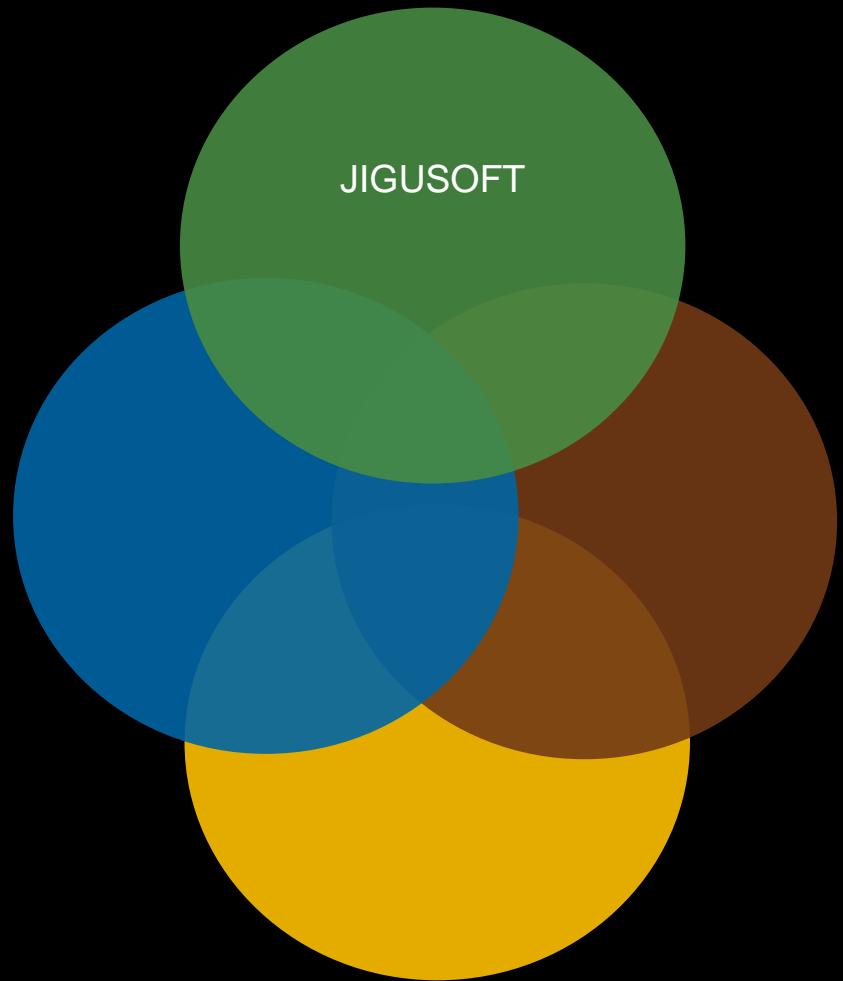


- Model Maker / Spatial Modeler is very capable but it is **20 years** old.
- **Multicore** machines are mainstream
- GeoMedia **vector and grid** functionality can greatly extend the problem solving capabilities
- **Point Cloud** processing must be a part of the solution



- Python is a cross platform scripting language with huge popularity
- Easy to learn and use
- Implemented as a thin wrapping of Solution Builder Modules
- All Solution Builder operations available through Python





ERDAS Marketing Review

- 27 English **webinars** | 9 Spanish webinars
 - 2,211 attendees (English) | 2,855 (Spanish)
 -

- 30,300 registered users on www.erdas.com



- Monthly E-Newsletter -
 - For November: 33,578 delivered | 6,202 opens (18.5%) | 724 click-throughs (11.7%)
- 11  ERDAS TV Webisodes
- 40 Press Releases
- 31 Featured Articles and Interviews in Industry Publications
- 87 Workflow Demo Movies on ERDAS Channel on 
 - 251 subscribers | 51,563 views

교육센터 안내



교육대상

무료교육

구매년도와 상관없이 정식라이센스를 보유한 모든 고객(무료, 교재비 별도)
공공기관 및 교육기관에 소속된 교육희망자(무료, 교재비 별도)

유료교육

그외 일반 대상(유료 : 43만원/인, 교재비 포함)

교육내용

기본과정

영상처리(ERDAS IMAGINE 1), 영상분석(ERDAS IMAGINE 2), 영상제작(LPS Suite)

특화과정

Photogrammetry, Remote Sensing Analysis, Development Analysis

교육시간

매달 2째 주 화, 수, 목, 금 (4일간)

수강시간 09:30 ~ 17:00

점심시간 12:30 ~ 14:00

교육관련

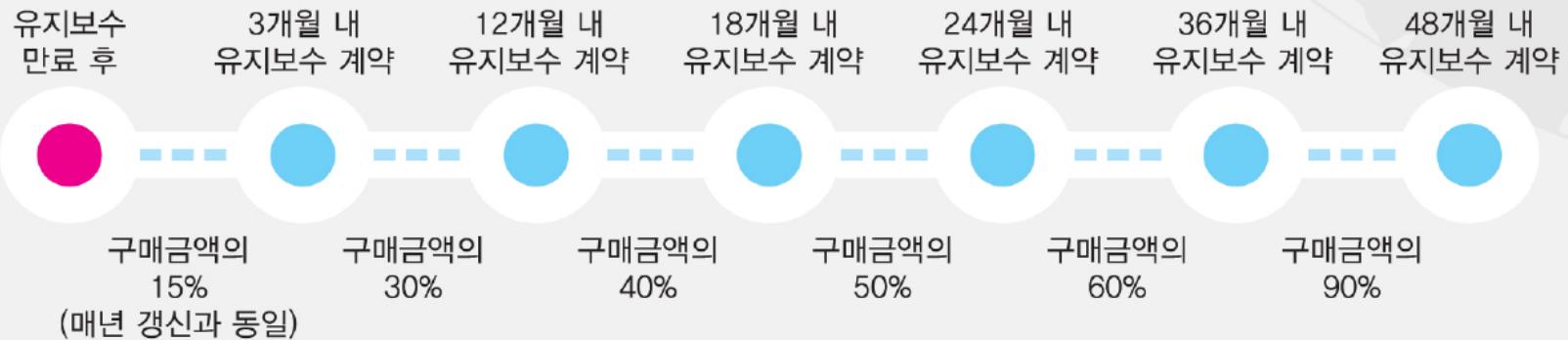
ERDAS 3일 교육 후 수료증 수여

ERDAS 교육 시 교통비, 식사비는 제공되지 않습니다.

ERDAS 제품군



연간 유지보수 비용



유지보수 정책

- + 유지보수 비용은 전체구매 금액을 기준
- + 신규구매 시 납품일로부터 1년간 무상 지원

유지보수 내용

- + 분기별 정기점검 및 긴급점검(요청시 24시간 이내)
- + 제품 군 최신 업그레이드
- + 고객 맞춤형 기술 지원 및 컨설팅
- + 방문 교육 실시(2일)

이후, 본격적인

ERDAS 데 스 크 탑 – 상세한 기능설명 및 동영상 시연

ERDAS 엔터프라이즈 – 상세한 기능설명 및 동영상 시연

이 있습니다. !

감사합니다.