Geoinformational Support
Geo4IRBM
for Integrated River Basins Management

ASIAN DEVELOPMENT BANK

SIAP
Sustainable Infrastructure Assistance Program

Earth Observation for Enhanced Water Security

Context of Geo4IRBM contribution

Australian Aid

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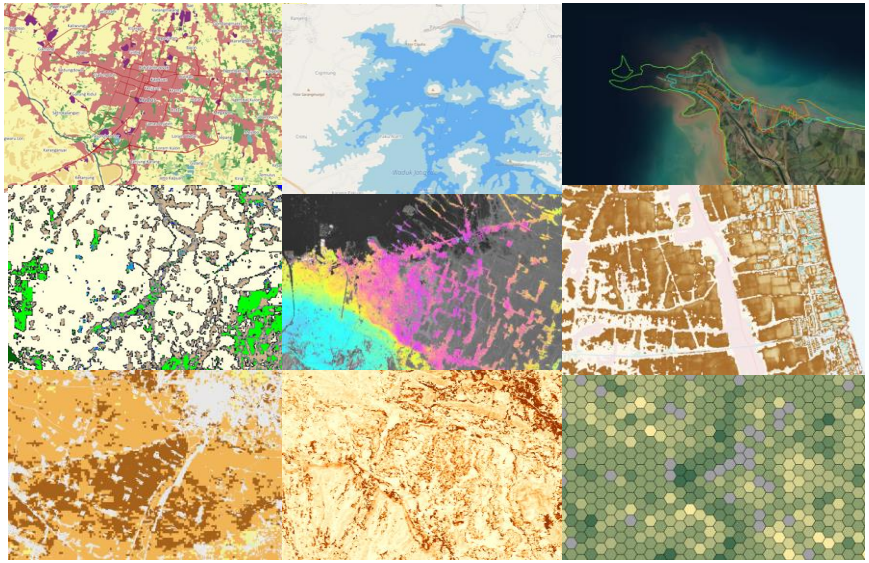
Geo4IRBM project goals

- Rapid elaboration and provision of certain informational products and services, based on satellite EO monitoring
- Application of integrated river basin management approach on level of data and information integration
- Capacity building – data sharing, tools provision and experience exchange with ADB and involved administration representatives

9 products and services lines



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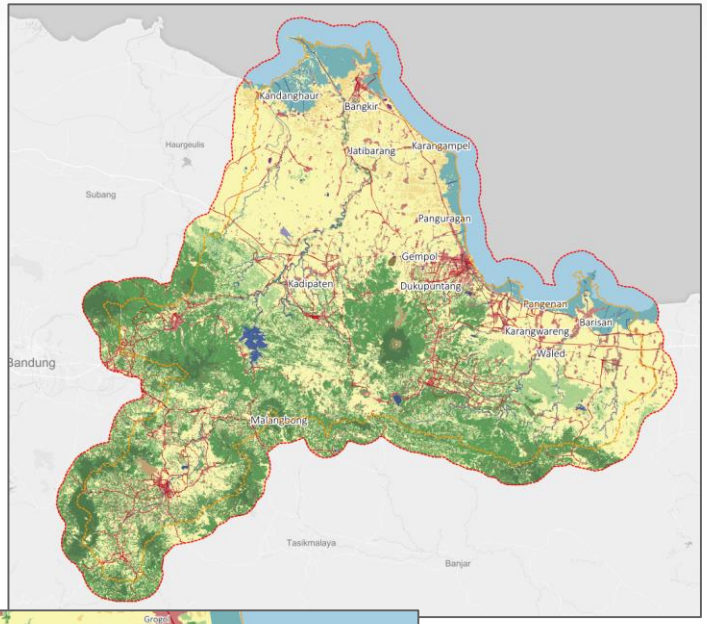
Geo4IRBM in FRM and RWS

Land Cover Maps

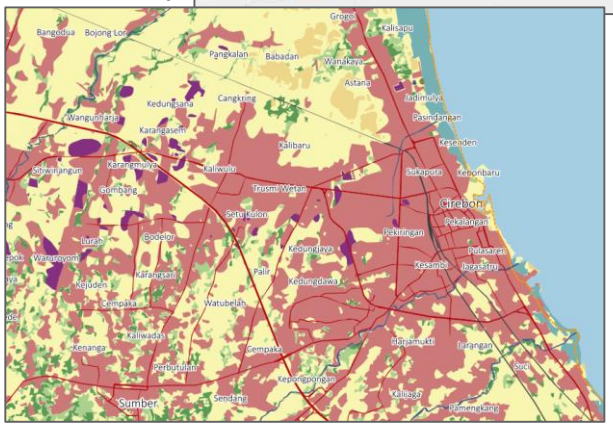
Applied for:

- Hydrological and hydrodynamic models to optimize water management, as information on terrain roughness
- Reference for Potential soil erosion modelling, Land Cover Changes mapping, Cropping intensity mapping, Ecosystems mapping

Land Cover map for Cimanuk-Cisanggarung WS



Cirebon city

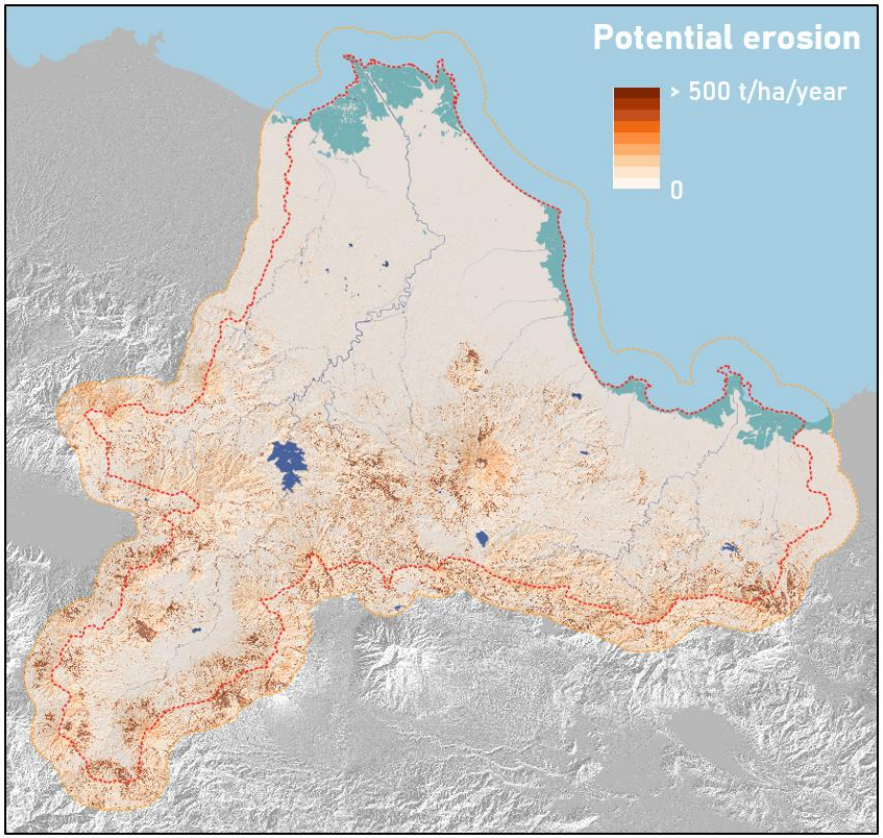


Geo4IRBM in FRM and RWS

Potential Soil Erosion Maps

Applied for:

- Delimitation of areas endangered with high erosion (consequence of deforestation and lava flows)
- Delimitation of areas endangered with landslides (possible influence on streams flows and floods occurrences)
- Sediment yield modelling



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Geo4IRBM in FRM and RWS

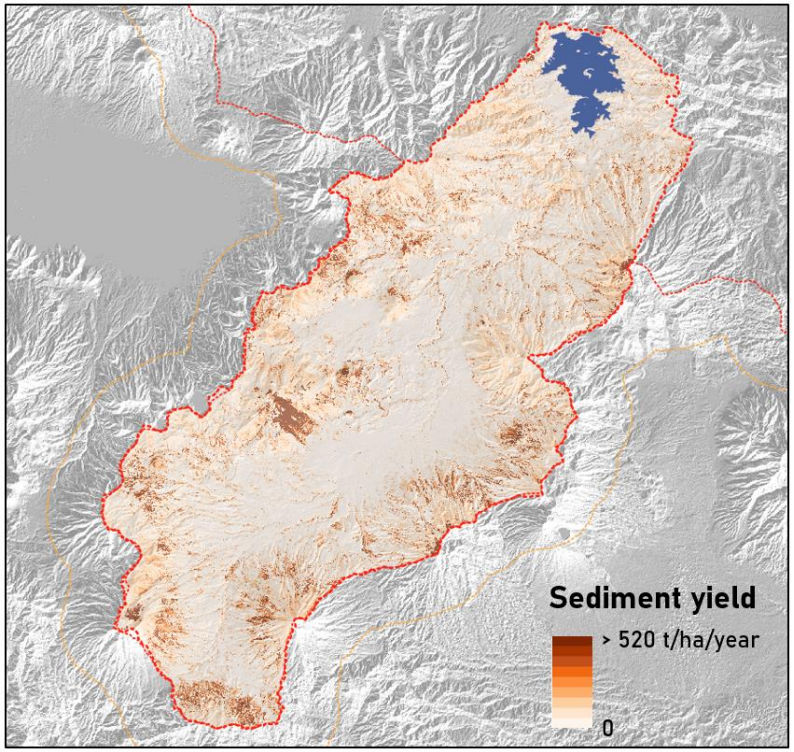
Sediment yield modelling

(4 selected reservoirs basins of Cimanuk-Cisanggarung WS)

Applied for:

- Determination of expected lifespan of selected reservoirs
- Support in prioritisation of investments connected water supply assurance for agriculture
- Support in initial definition of infrastructural countermeasures against silting of reservoirs

Jatigede Reservoir



Jatigede Reservoir

Capacity: 800Mm³
Basin area: 1490.59km²

Scenario	Sediment yield t/year	Sediment yield m^3/year*	Reservoir fill time years
Current annual precipitation	12,300,000.94	10,271,439.12	95.41
5% precipitation increase	12,988,612.14	10,823,843.45	90.54
10% precipitation increase	13,663,773.87	11,386,478.22	86.07
15% precipitation increase	14,342,117.80	11,951,764.83	82

Geo4IRBM in FRM and RWS

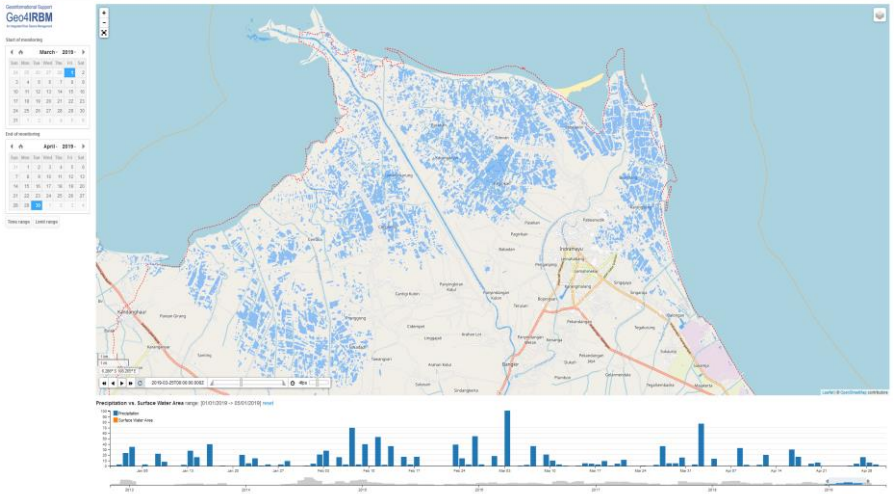
Surface Water Monitoring Service

Applied for:

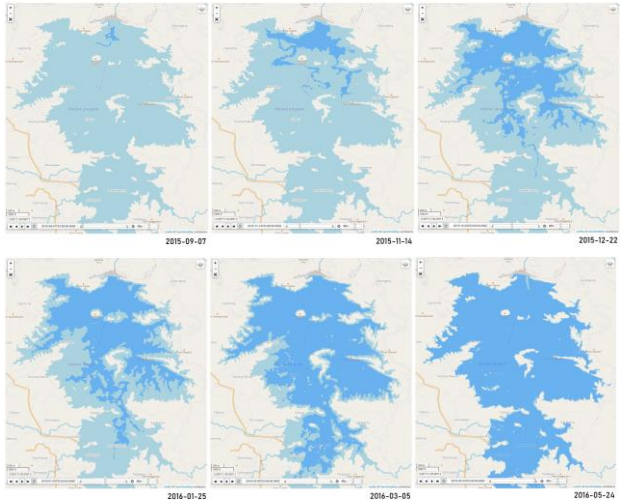
- Elaboration of long term surface water coverage variability information

Applicable also for:

- Monitoring of flooded rice fields
- Monitoring of reservoirs filling level
- Detection of floods and inundations



Web portal of Water Monitoring Service



Operation of initial filling of Jatigede Reservoir

Geo4IRBM in FRM and RWS

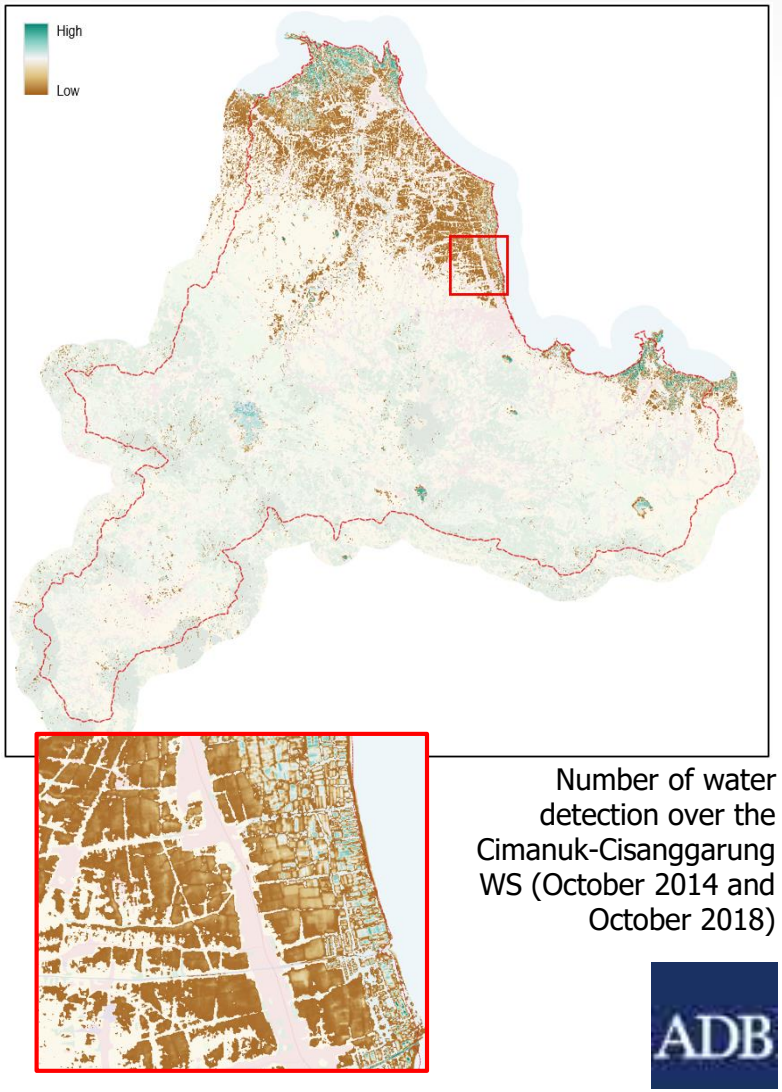
Long-term Surface Water Coverage Mapping

Applied for:

- Delimitation of irrigation schemes
- Support in the process of assessment of agriculture water demands

Applicable for:

- Historical floods range delimitation
- Reference for floods detection



Number of water detection over the Cimanuk-Cisanggarung WS (October 2014 and October 2018)

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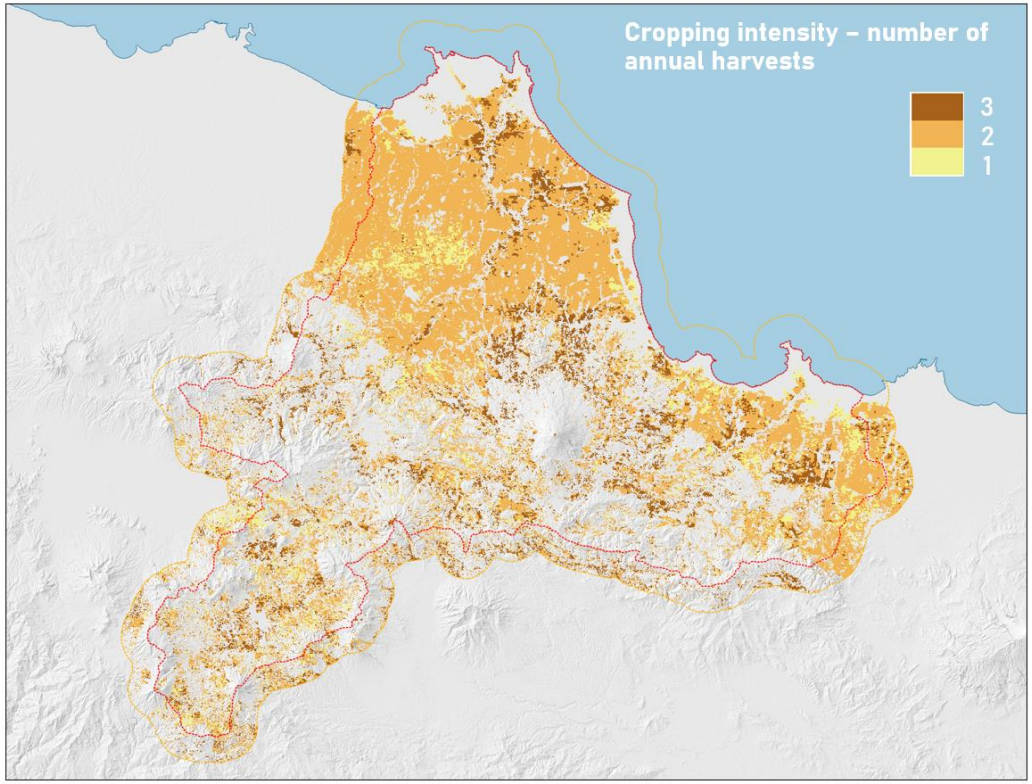
Cropping Intensity Mapping

Applied for:

- Analysis of cropping intensity distribution over WS for the needs of assessment of water supply sufficiency for agriculture



Map for Cimanuk-Cisanggarung WS for 2018

Geo4IRBM in FRM and RWS

Coastline Changes Mapping

Applied for:

- Monitoring of coastline dynamics, detection and assessment of influence of costal erosion, sedimentation, surface subsidence, sea level rise

Sedimentation dynamics in Cimanuk Anyar estuary (measured along the river)

1975-1990	770m	51m/yr
1990-2000	1450m	145m/yr
2000-2018	2350m	130m/yr

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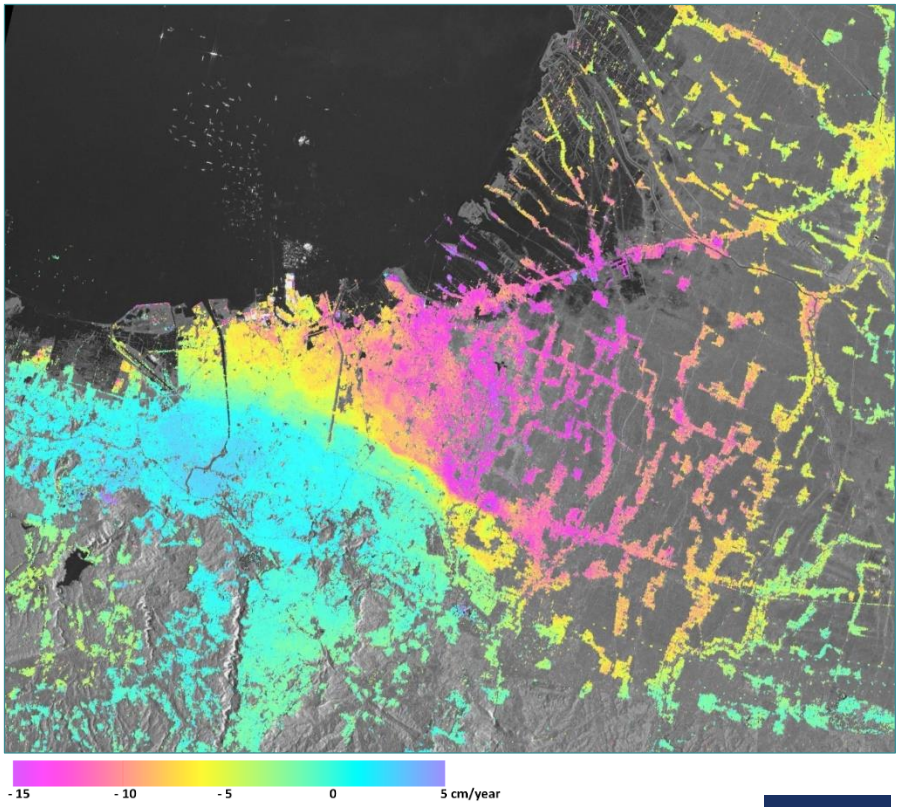
Geo4IRBM in FRM and RWS

Surface Deformation Monitoring

Applied for:

- Monitoring of vertical surface movements, mainly surface subsidence.

The deformation map of Semarang City and surroundings (Jratunseluna WS)



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Objectives of Geo4IRBM mission

- Demonstration of products and services
- Introduction of applied techniques, methods and data sources
- Familiarisation with fields of applications
- Training in the scope of products and services application and basics of remote sensing techniques applied in production and development

Sustainability – operational context

- Involvement of EO/GIS specialist starting from preparatory phase of undertaking up to post implementation evaluation and monitoring
- Recognition of informational gaps (obsolete, insufficient data sources)
- Joined definition of products and services requirements
- Joined definition of usecases in reference to informational value and limitations of products and services

Sustainability – technical context

- Elaboration/improvement of reference datasets for areas of interest
- Establishment of technical framework of continuous EO monitoring (cloud solutions, internet connection assurance)
- Application of methods of information and data fusion (in-situ data application and multisensorial approach)
- Exploitation and maintenance of interconnections between informational resources
- Mapping and monitoring of phenomena with independent means, potentially indirectly – to improve results