Two new monitoring projects important for conservation in Northern Caucasus

About NextGIS

- Geospatial developers
- Open source
- since 2011
- Build locally, used globally



Two projects

- Mapping Western Caucasus conservation areas and threats
- KEDR official-level RS based system to monitor forest changes and act on them

Consorcium

- WWF Russia + Caucasus branch of WWF Russia
- Ecowatch on Northern Caucasus
- Russian Geographical Society, Sochi branch
- Transparent World
- NextGIS

РОССИЙСКАЯ ФЕДЕРАЦИЯ

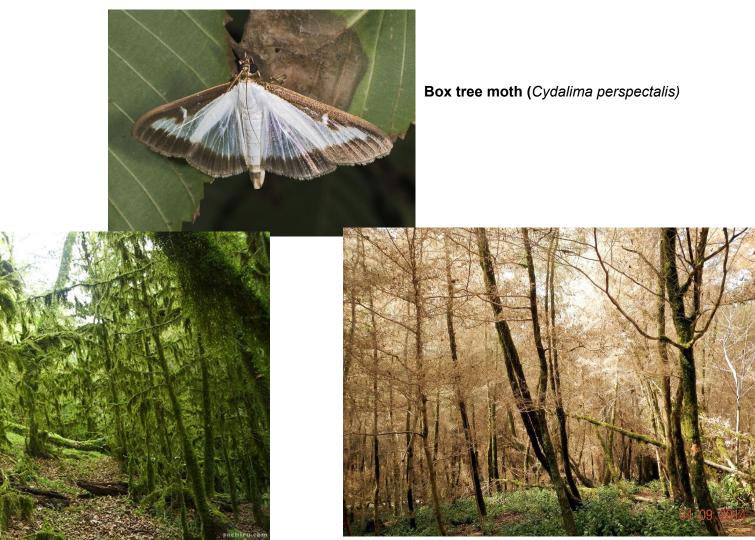
ФЕДЕРАЛЬНЫЙ ЗАКОН

ОБ ОСОБО ОХРАНЯЕМЫХ ПРИРОДНЫХ ТЕРРИТОРИЯХ

Принят Государственной Думой 15 февраля 1995 года







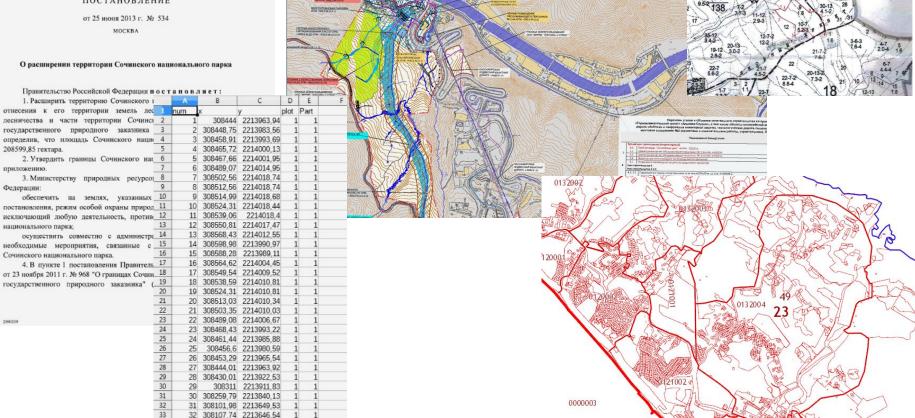
Mapping Western Caucasus conservation areas and threats

- 1. Aggregate data on areas important for conservation
- 2. Provide a platform for parties to work with this data



ПРАВИТЕЛЬСТВО РОССИЙСКОЙ ФЕДЕРАЦИИ

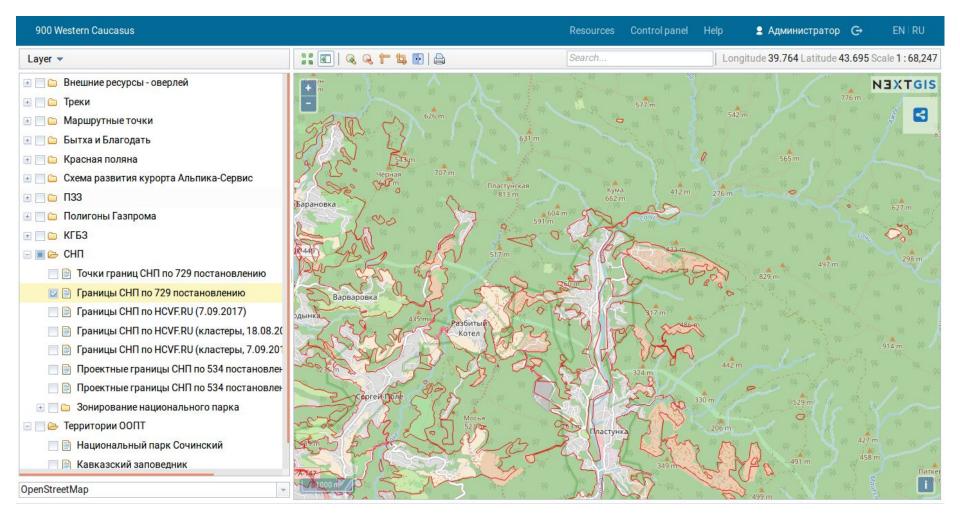
ПОСТАНОВЛЕНИЕ



Sources

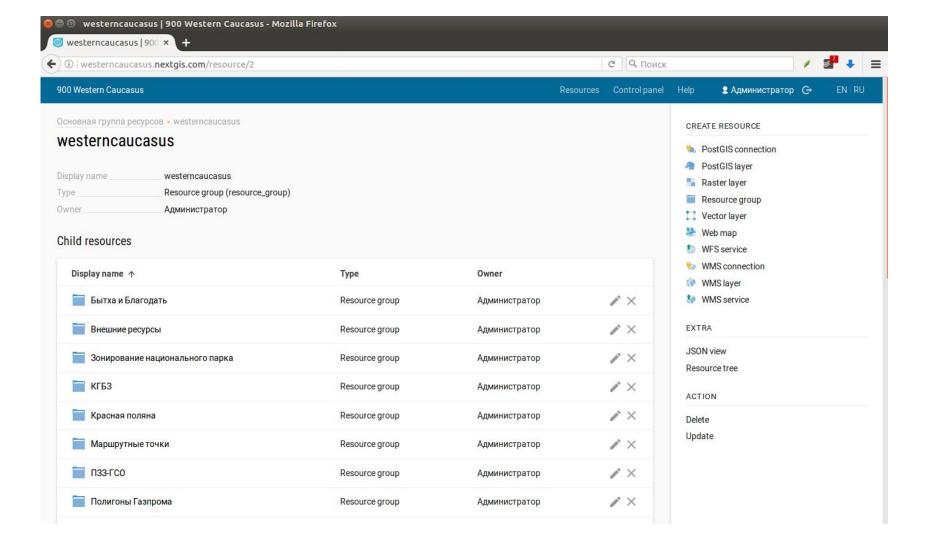
Схема развития Горноклиматического к

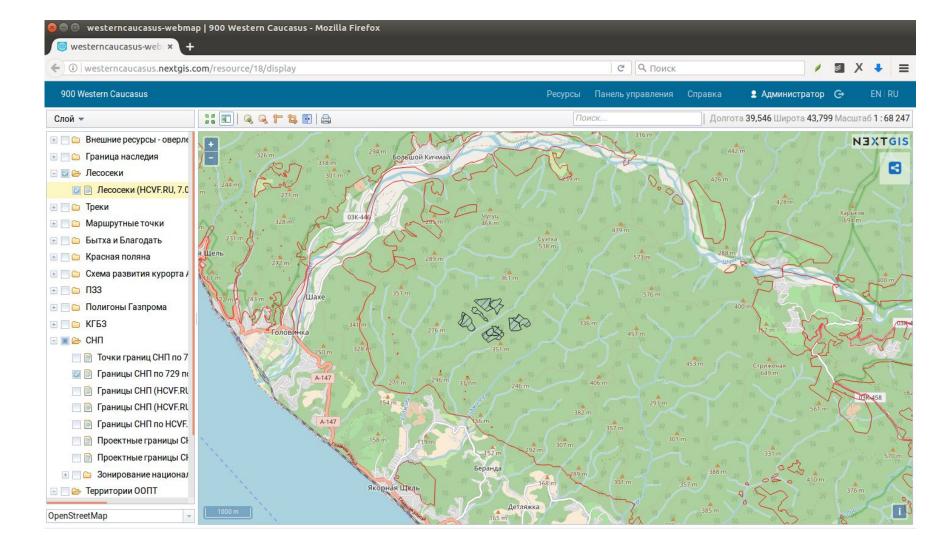
Этап строительст



Mapping World Heritage's conservation areas and threats

- 1. Aggregate data on areas important for conservation
- 2. Provide a platform for parties to work with this data





Mapping World Heritage's conservation areas and threats

- 1. Aggregate data on areas important for conservation
- 2. Provide a platform for parties to work with this data
- 3. Perform operational monitoring

Developers







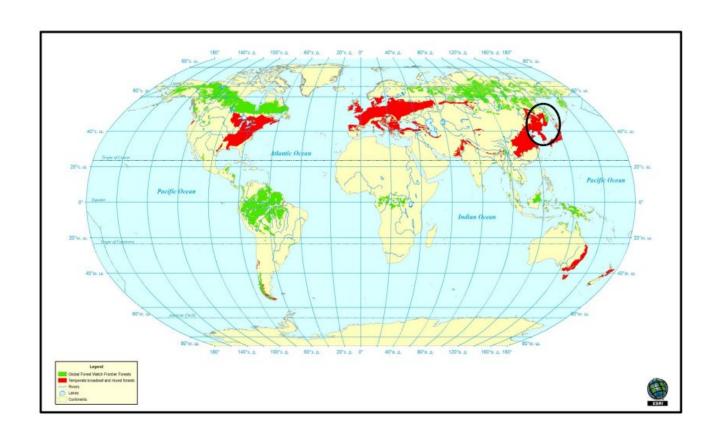


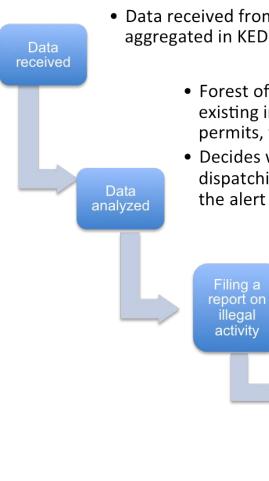
UNIVERSITY OF MARYLAND





KEDR





 Data received from different sources is aggregated in KEDR system

> Forest officer compares data with existing info – the leases, logging permits, the past records, etc

 Decides whether to send a dispatching forest team to check the alert on the ground

Reporting

system



 The report can be filed from the site with the use of mobile app

 Forest officer decides to pass this report to forest police

- Preparing a report
- Calculating financial loss by illegal activity
- Filing these data in one database

Results

Data received: remote sensing

- weekly updates
- dates, approved (change appeared on several images) or not approved changes (change appeared on one image)
- base metrics and current image(s) sequentially compared
- Landsat 7,8
- all previous alerts are subtracted

More information: http://glad.umd.edu/alerts

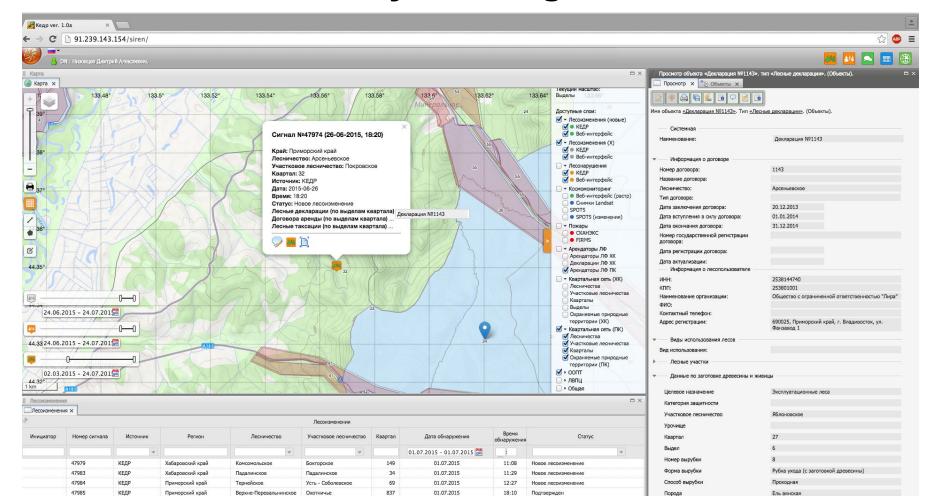
Data received: field reporting







Data analyzed: 'regular' GIS



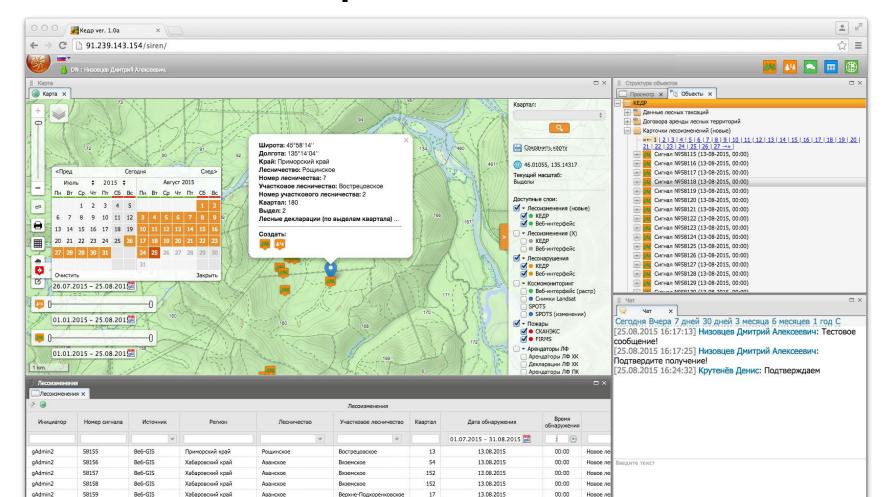
Data analyzed: ML prioritizer

- Criterion: (Timber sale Timber extraction) -> max
- Params: timber price, volume on site, transportation price
- Training (historical params data on known sites)
- ML custom model optimized for maximum profit
- Classify all sites, rank them

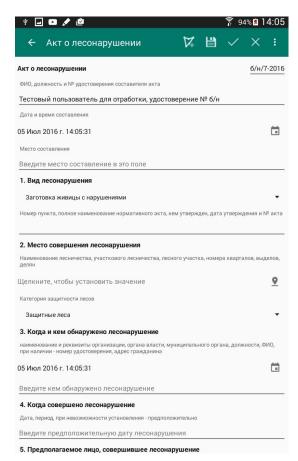
$$P(v) = \frac{1}{1 + exp \left[-\alpha \left(c_{w(v)} (1 + p_{w(v)}) - \sum_{i=0}^{n} r_i c_i \right) \right]}$$

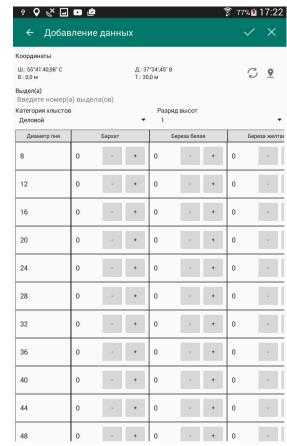
 $c_{w(v)}$ - unit price for wood class w in site v c_i - length of road type i - volume of wood class w in site v c_i - price for transportation on road type i

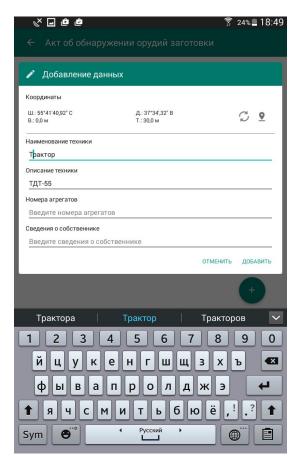
Dispatch team sent



Official disturbance reports on-site







Forest disturbance act

Per-tree disturbance act

Disturbance tools act

Results



17 cases of illegal logging were detected in Primorye thanks to KEDR forest monitoring system, developed by WWF Russia and recently handed over to the supervision of the Primorsky province Administration.

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Thank you!

http://westerncaucasus.nextgis.com