

# **Дополнительные технологии интеллектуализации ГИС**

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# Groovy

Скриптовый язык для виртуальной машины Java

Дополнительные возможности из языков Python, Ruby и Smalltalk

Динамическая типизация

Замыкания из Лиспа

Легкость в изучении

Возможность создания языков предметных областей



The screenshot shows the Groovy website homepage. At the top, there is a navigation bar with links for 'Documentation', 'Community & Support', 'IDE Support', and 'Download'. A search bar is located on the right. The main header features the Groovy logo and the tagline 'A dynamic language for the Java platform'. A prominent 'Download Groovy 1.8' button is visible. The 'Home' section contains a list of features under the heading 'Groovy...'. Below this, there is a section titled 'Experience Groovy 1.8' with a sub-heading and a paragraph of text. A 'Samples' section follows, showing a simple 'hello world' script and a more sophisticated version using Object Orientation. On the right side, there are sections for 'Training Events ...', 'Information' (with links to News, FAQ, Roadmap, and Eclipse plugin), and 'Books ...' (with a book cover for 'Groovy in Action').

★ Groovy Documentation Community & Support IDE Support Download Search

**Groovy** A dynamic language for the Java platform [Download Groovy 1.8](#)

## Home

### Groovy...

- is an agile and **dynamic language** for the **Java Virtual Machine**
- builds upon the strengths of Java but has **additional power features** inspired by languages like Python, Ruby and Smalltalk
- makes **modern programming features** available to Java developers with **almost-zero learning curve**
- supports **Domain-Specific Languages** and other compact syntax so your code becomes **easy to read and maintain**
- makes writing shell and build scripts easy with its **powerful processing primitives**, OO abilities and an Ant DSL
- increases developer productivity by **reducing scaffolding code** when developing web, GUI, database or console applications
- **simplifies testing** by supporting unit testing and mocking out-of-the-box
- seamlessly **integrates with all existing Java classes and libraries**
- compiles straight to Java bytecode so you can use it anywhere you can use Java

### Experience Groovy 1.8

 **Groovy 1.8** is the latest **major and stable version** of the popular dynamic language for the JVM. To learn more about the novelties, make sure to **read the release notes**. In a nutshell, Groovy 1.8 provides new **Domain-Specific Language authoring capabilities** for more readability and expressivity of your business rules, runtime performance improvements, the bundling of the GParas parallel and concurrency library, built-in JSON support, **new compile-time meta-programming features** (several new useful AST transformations), new **functional programming aspects** for closures, and much more.

### Samples

\*Groovy is like a super version of Java. It can leverage Java's enterprise capabilities but also has cool productivity features like closures, builders and dynamic typing. If you are a developer, tester or script guru, you have to love Groovy.\*

A simple hello world script:

```
def name='World'; println "Hello $name!"
```

A more sophisticated version using Object Orientation:

### Information

- News
- FAQ
- Roadmap
- Eclipse plugin

### Books ...



# Groovy. Переменные

```
def x = 1
```

```
y = new java.util.Date()
```

```
z = -3.1499392
```

```
t = false
```

```
u = "Hi"
```

```
Получатель = 'Иванов П.И.'
```

```
println Получатель
```

```
Иванов П.И.
```

# Groovy. Списки

```
def list = [5, 6, 7, 8]
список = [1, 2, "папа", "мама", false]
println список[3]
мама
println список.size()
5
println список.reverse()
[false, "мама", "папа", 2, 1]
```

# Groovy. Карты

```
def map = [name:"Gromit", likes:"cheese"]
```

```
карта = [имя: "Петя", любит: "сыр"]
```

```
println карта["имя"]
```

Петя

```
карта["имя"] = "Маша"
```

```
println карта
```

```
["имя":"Маша", "любит":"сыр"]
```

```
пустая_карта = [:]
```

# Groovy. Диапазоны

```
def range = 1..10
```

```
диапазон = 5..8
```

```
println диапазон.size()
```

```
4
```

```
println диапазон.from
```

```
5
```

```
println диапазон.to
```

```
8
```

```
println диапазон[2]
```

```
7
```

```
println диапазон[22]
```

```
null
```

```
println диапазон.contains(6)
```

```
true
```

```
println диапазон.contains(9)
```

```
false
```

# Groovy. Обработка строк

```
текст = "Папа и мама ждут дочку"
```

```
println текст[7]
```

```
М
```

```
println текст[7..10]
```

```
мама
```

```
println текст[7..10]+текст[4..6]+текст[17..20]+текст[1]
```

```
мама и дочка
```

```
println текст.reverse()
```

```
укчод тудж амам и апаП
```

```
println текст*2
```

```
Папа и мама ждут дочкуПапа и мама ждут дочку
```

# Groovy. Логические ветвления

Такие же как в Java:

```
if ( ... ) {
```

```
...
```

```
} else if (...) {
```

```
...
```

```
} else {
```

```
...
```

```
}
```

```
x = (y > 1) ? "worked" : "failed"
```



# Groovy. Циклы

```
for( i in 4..7 ) {  
    println i*3  
}
```

12

15

18

21

```
список = ["папа",  
          "мама",  
          "кошка",  
          "мышка"]
```

```
список.each() {
```

```
    кто -> println "Привет ${кто}!"
```

```
}
```

Привет папа!

Привет мама!

Привет кошка!

Привет мышка!

```
карта.each() {
```

```
    ключ, значение ->
```

```
    println "Пара: ${ключ} - ${значение}"
```

```
}
```

Пара: имя - Маша

Пара: любит - сыр

# Groovy. Реальный скрипт Invisible

```
import edu.stanford.smi.protege.ui.DisplayUtilities
runa = ru.igis.omtab.OpenMapTab.ruNA
mm = runa.mapObs.targets
vv = mm.findAll{ it.visible }
ii = vv.collect{ it.instance }
tt = DisplayUtilities.pickInstancesFromCollection( null, ii, "Invisible")
tt.each
{
    mo = runa.getMapOb( it )
    mo.visible = false
}
```

# OpenLayers

Библиотека ГИС для Web-приложений на языке JavaScript

Позволяет вставлять динамические карты в любые Web-страницы

Поддерживает многочисленные форматы геоданных: WMS, KML, GML, GoogleMap, OSM, WFS, WMC, WorldWind, ..

Имеет развитый инструментарий

Free Open Source



The screenshot shows the OpenLayers website homepage. The browser title is "OpenLayers: Home - Mozilla Firefox". The page features a navigation menu with links for Home, Support & Development, Sponsorship, Documentation, Download, FAQ, Email Lists, and Blog. The main content area includes a large map of Europe with a compass and a plus sign, and a text box that says "Put an open map widget in any web page! Double-click to zoom in, and drag to pan. Hold down the shift key and drag to zoom to a particular region." Below the map, there is a section titled "OpenLayers: Free Maps for the Web" and a "Get OpenLayers Now!" section with links to download the 2.11 stable version, release notes, class documentation, and examples. The "About..." section describes the library's purpose and license. The "Supporting OpenLayers" section mentions sponsors and the development community. The "For Developers!" section highlights the JavaScript API and the Open Source software community. The "Getting the Code" section provides information on downloading the code and using Subversion. The footer includes the OSGeo logo and the text "OpenLayers is a project of the Open Source Geospatial Foundation."

# OpenLayers. Пример

```
<html>
<head>
  <title>OpenLayers Example</title>
  <script src="http://openlayers.org/api/OpenLayers.js"></script>
</head>
<body>
  <div style="width:100%; height:100%" id="map"></div>
  <script defer="defer" type="text/javascript">
    var map = new OpenLayers.Map('map');
    var wms = new OpenLayers.Layer.WMS( "OpenLayers WMS",
      "http://vmap0.tiles.osgeo.org/wms/vmap0", {layers: 'basic'} );
    map.addLayer(wms);
    map.zoomToMaxExtent();
  </script>
</body>
</html>
```

HTML-файл

HTML-файл открыт в  
браузере





# OpenLayers. Примеры источников геоданных

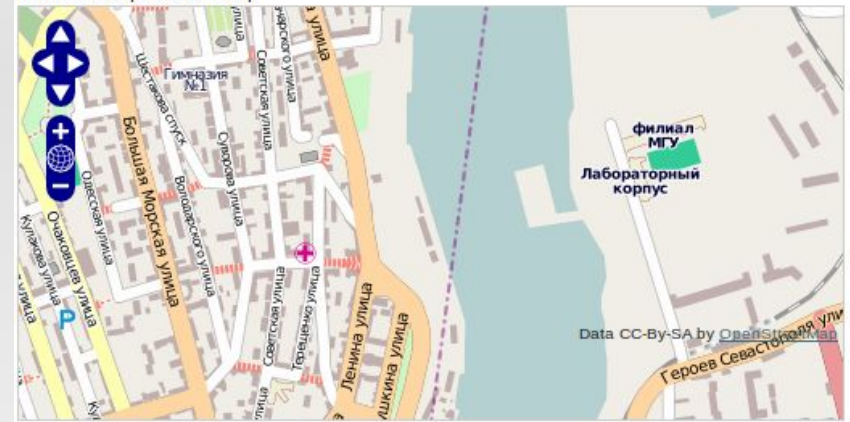
## Google (v3) Layer Example

Demonstrate use the Google Maps v3 API.



## Basic OSM Example

Show a Simple OSM Map



## OSM and Google Together

Demonstrate use of an OSM layer and a Google layer as base layers.

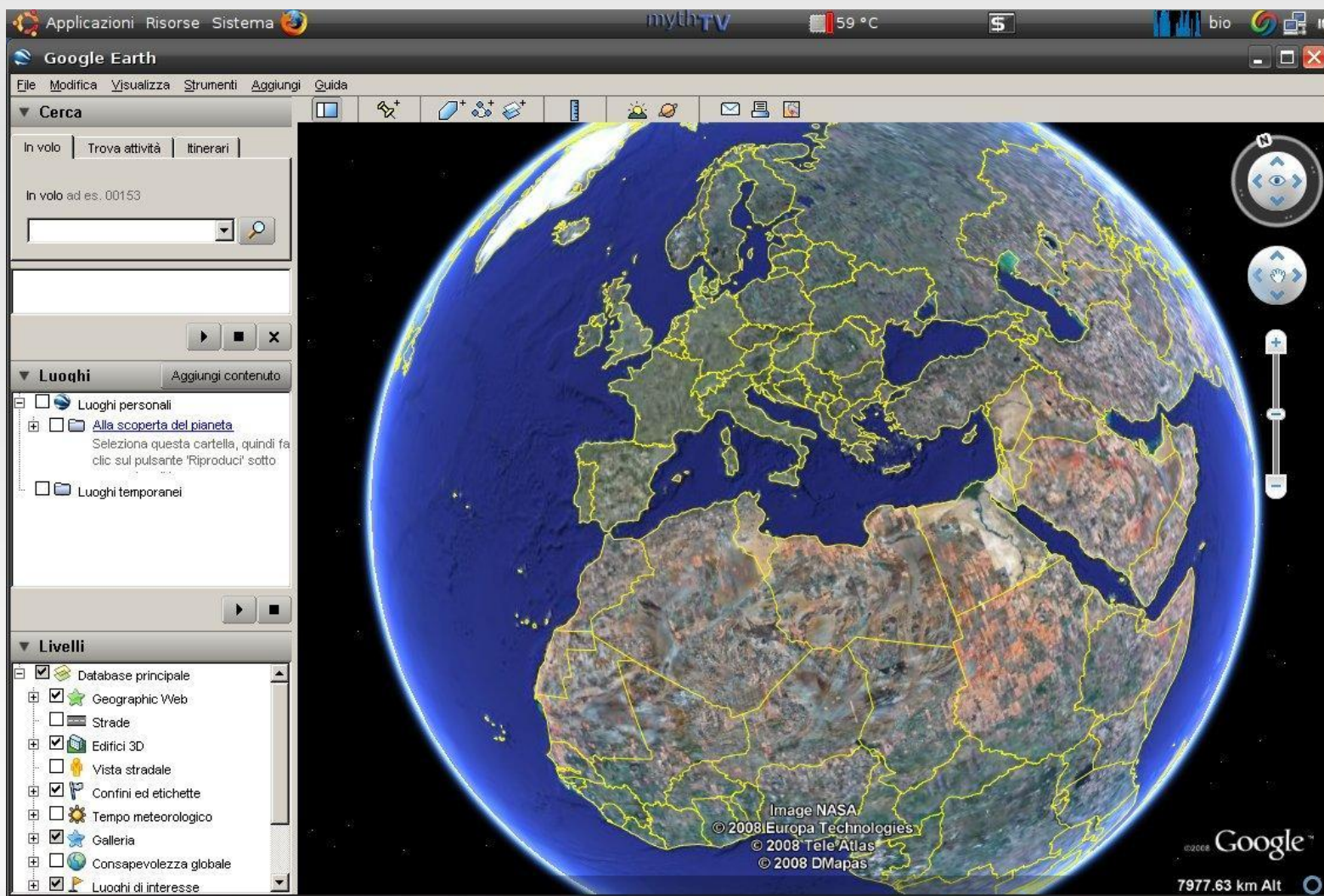


## Google (v3) allOverlays Layer Example

Demonstrate use the Google Maps v3 API with allOverlays set to true on the map.



# Google Earth





# KML

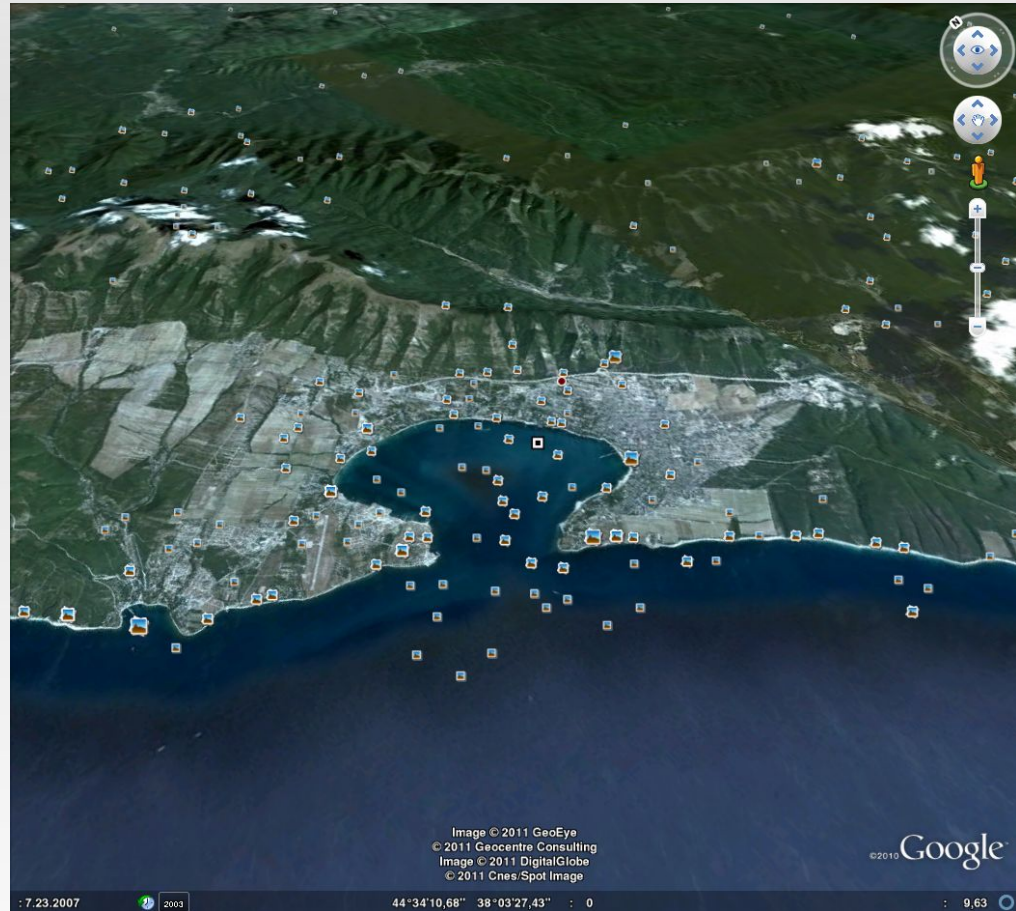
**KML** – это формат файла, который используется для отображения географических данных в средствах просмотра Земли, например Google Планета Земля, Карты Google и Карты Google для мобильных устройств.

**KML** создан на основе стандарта XML и использует основанную на тегах структуру с вложенными элементами и атрибутами.

Передается по сети обычно в сжатом формате **KMZ**

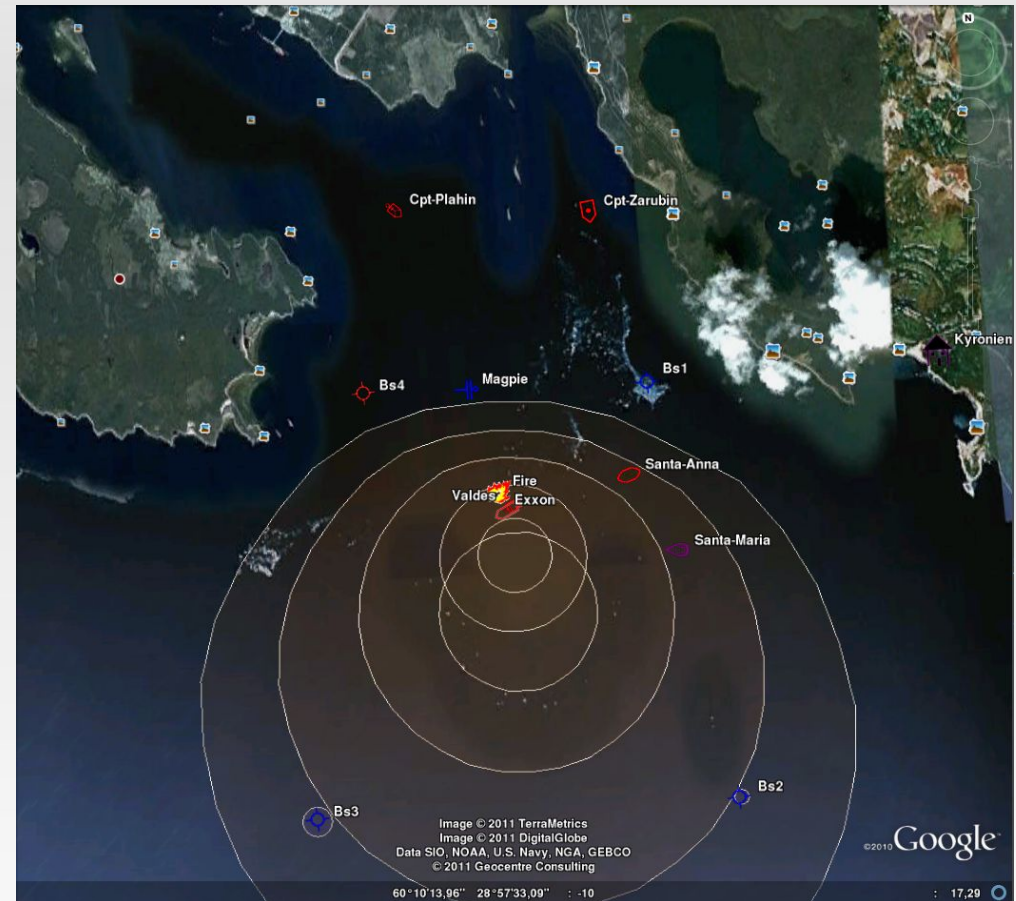
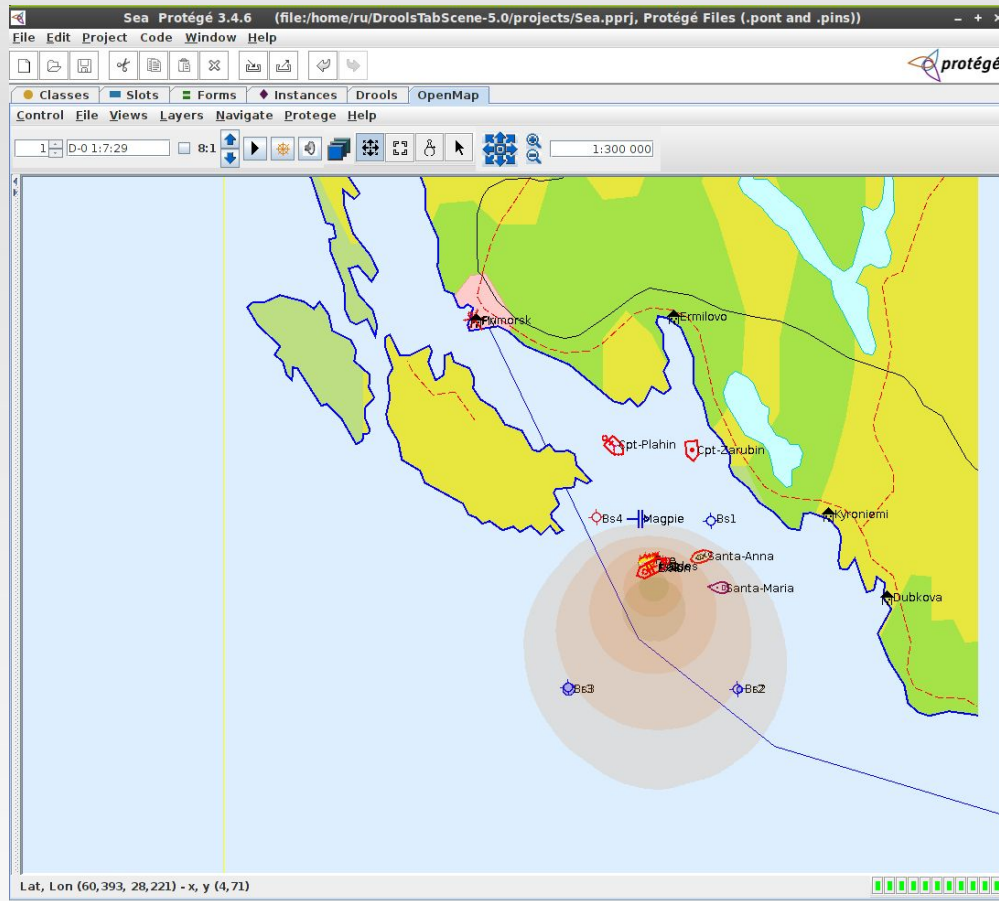
# KML. Геленджик

```
<?xml version="1.0" encoding="UTF-8"?>
<kml xmlns="http://earth.google.com/kml/2.1">
<Placemark>
  <name>Геленджик</name>
  <description><![CDATA[<p>Геленджик, Краснодарский край, Россия.</p>Город
  располагается по&nbsp;&nbsp;&nbsp;берегам Геленджикской бухты,
  но&nbsp;&nbsp;&nbsp;не&nbsp;&nbsp;&nbsp;равномерно (восточный берег исторически
  более населён).]]></description>
  <LookAt id="khLookAt540_copy0">
    <longitude>38.0576198113139</longitude>
    <latitude>44.56963150481845</latitude>
    <altitude>0</altitude>
    <range>14693.40972993507</range>
    <tilt>49.10268313434742</tilt>
    <heading>37.85562764777833</heading>
  </LookAt>
  <Style>
    <IconStyle>
      <scale>0.9</scale>
      <Icon>
        <href>root://icons/palette-4.png</href>
        <x>32</x>
        <y>128</y>
        <w>32</w>
        <h>32</h>
      </Icon>
    </IconStyle>
    <LabelStyle>
      <scale>0.9</scale>
    </LabelStyle>
  </Style>
  <Point id="khPoint541_copy0">
    <coordinates>38.06284424434902,44.56842733252498,0</coordinates>
  </Point>
</Placemark>
</kml>
```





# Сценарий разлива нефти



# Сценарий разлива нефти. KML

```
<coordinates>28.627832412719727,60.356998443603516</coordinates>
</Point>
</Placemark>
- <Placemark id="bb1aae71-a77f-405b-873d-c3b4b48a744c">
  <name>Exxon</name>
  <styleUrl>#Exxon</styleUrl>
  - <Point id="42610e90-ee8-4425-8d69-2acadd344f30">
    <coordinates>28.785852432250977,60.246421813964844</coordinates>
  </Point>
</Placemark>
- <Placemark id="d8312d9d-4a4a-450b-88b0-240ae1098633">
  <name>Valdes</name>
  <styleUrl>#Valdes</styleUrl>
  - <Point id="48da9294-0755-4eea-a4be-7277a010d40f">
    <coordinates>28.78731346130371,60.24712371826172</coordinates>
  </Point>
</Placemark>
- <Placemark id="6ac4c839-9f9e-4541-902e-1564678a1a73">
  <name>hs1</name>
  <styleUrl>#hs1</styleUrl>
  - <Polygon id="f893a831-f055-4d84-8c03-9f0f17e7936d">
    - <outerBoundaryIs>
      - <LinearRing id="6058c670-f9d5-45b3-af56-28db50c58a56">
        - <coordinates>
          28.780757904052734,60.26610565185547 28.80381202697754,60.265342712402344 28.82615089416504,60.26206970214844
          28.84760856628418,60.256011962890625 28.8702392578125,60.24917221069336 28.884897232055664,60.239845275878906
          28.895917892456055,60.2297477722168 28.902795791625977,60.218894958496094 28.907140731811523,60.207557678222656
          28.905858993530273,60.19622039794922 28.900341033935547,60.18544006347656 28.89063835144043,60.17549514770508
          28.876869201660156,60.166282653808594 28.859683990478516,60.15951919555664 28.839859008789062,60.15353012084961
          28.8182315826416,60.150291442871094 28.796327590942383,60.147525787353516 28.773155212402344,60.148414611816406
          28.75034523010254,60.15227508544922 28.728208541870117,60.15939712524414 28.709768295288086,60.166282653808594
          28.694181442260742,60.17549514770508 28.681835174560547,60.18544006347656 28.674076080322266,60.19622039794922
          28.670597076416016,60.207557678222656 28.67101287841797,60.218894958496094 28.677413940429688,60.2297477722168
          28.688434600830078,60.239845275878906 28.70309066772461,60.24917221069336 28.7160587310791,60.256011962890625
          28.735937118530273,60.26206970214844 28.757701873779297,60.265342712402344 28.780757904052734,60.26610565185547
        </coordinates>
      </LinearRing>
    </outerBoundaryIs>
  </Polygon>
</Placemark>
- <Placemark id="151b756e-56a6-4ac3-8f71-5bdf76314413">
  <name>Brest Tide</name>
  <styleUrl>#Brest Tide</styleUrl>
  - <Polygon id="222a6331-751c-4a67-87b0-6a0b6a3e9888">
```

# KML. Структура документа

## Макет структуры

```
-<kml>
  -<Document>
    <Style> .. </Style>
    ...
    <Placemark> .. </Placemark>
    ...
  </Document>
</kml>
```

## Пример документа

```
-<kml>
  -<Document id="e684736c-edde-4c54-819d-cc2d83fe5c78">
    -<Style id="Dubkova">
      -<IconStyle id="6549e4b7-f579-4ac0-b0bc-80d53b356014">
        <heading>0.0</heading>
      -<Icon>
        -<href>
          file:/home/ru/DroolsTabScene-5.0/data/images/home.gif
        </href>
      </Icon>
    </IconStyle>
  </Style>
  -<Placemark id="0d6b7043-5ffe-4c52-9da7-50acbfd0d19c">
    <name>Dubkova</name>
    <styleUrl>#Dubkova</styleUrl>
    -<Point id="3fbe778b-b534-4b46-b45d-c714fbb295d5">
      <coordinates>28.997333526611328,60.23350143432617</coordinates>
    </Point>
  </Placemark>
</Document>
</kml>
```

# KML. Стили

## Стиль значка

```
-<Style id="Cpt-Plahin">  
  -<IconStyle id="8b6444ee-1e8c-4313-bbab-f59a86fdf15a">  
    <heading>133.0</heading>  
    -<Icon>  
      -<href>  
        file:/home/ru/DroolsTabScene-5.0/data/images/rscr.gif  
      </href>  
    </Icon>  
  </IconStyle>  
</Style>
```

## Стиль многоугольника

```
-<Style id="hs3">  
  -<PolyStyle id="75f5eba4-eb52-4841-95ed-cefcae0edb5d">  
    <color>200066dd</color>  
  </PolyStyle>  
</Style>
```



# KML. Марки (Placemarks)

## Марка точки

```
-<Placemark id="185aaf1b-c337-461e-a490-94da4218e6cf">  
  <name>Cpt-Plahin</name>  
  <styleUrl>#Cpt-Plahin</styleUrl>  
  -<Point id="8e832a4c-fd56-4100-a821-e2cc5fc3ad84">  
    <coordinates>28.750823974609375,60.30149841308594</coordinates>  
  </Point>  
</Placemark>
```

## Марка многоугольника

```
-<Placemark id="989606fd-7a50-45d6-a66d-67a6f29fbb9a">  
  <name>hs3</name>  
  <styleUrl>#hs3</styleUrl>  
  -<Polygon id="acf1558f-a328-45f7-a87f-aa2b5e1fcfb9">  
    -<outerBoundaryIs>  
      -<LinearRing id="0755cd1c-d311-4d99-890e-493192c6ef09">  
        -<coordinates>  
          28.784366607666016,60.255977630615234 28.795637130737305,60.25548553466797 28.80656623840332,60.25400924682617  
          28.817480087280273,60.25107955932617 28.82723045349121,60.247642517089844 28.83427619934082,60.24324417114258  
          28.839616775512695,60.238346099853516 28.842775344848633,60.23297119140625 28.8439884185791,60.22758483886719  
          28.842775344848633,60.22220230102539 28.839954376220703,60.21683120727539 28.83504295349121,60.21194076538086  
          28.828332901000977,60.207542419433594 28.819778442382812,60.20412063598633 28.80991554260254,60.20119094848633  
          28.799325942993164,60.19972229003906 28.788150787353516,60.1992301940918 28.7769775390625,60.19972229003906  
          28.76619529724121,60.20119094848633 28.756141662597656,60.20412063598633 28.747203826904297,60.207542419433594  
          28.739824295043945,60.21194076538086 28.734052658081055,60.21683120727539 28.73055648803711,60.22220230102539  
          28.72934341430664,60.22758483886719 28.73055648803711,60.23297119140625 28.733715057373047,60.238346099853516  
          28.739055633544922,60.24324417114258 28.74610137939453,60.247642517089844 28.753835678100586,60.25107955932617  
          28.76283836364746,60.25400924682617 28.77328872680664,60.25548553466797 28.784366607666016,60.255977630615234  
        </coordinates>  
      </LinearRing>  
    </outerBoundaryIs>  
  </Polygon>  
</Placemark>
```