



# IMPLEMENTATION OF BASIN CONCEPT IN WATER RESOURCES MANAGEMENT OF MODERN RUSSIA



**Sergey BEDNARUK**

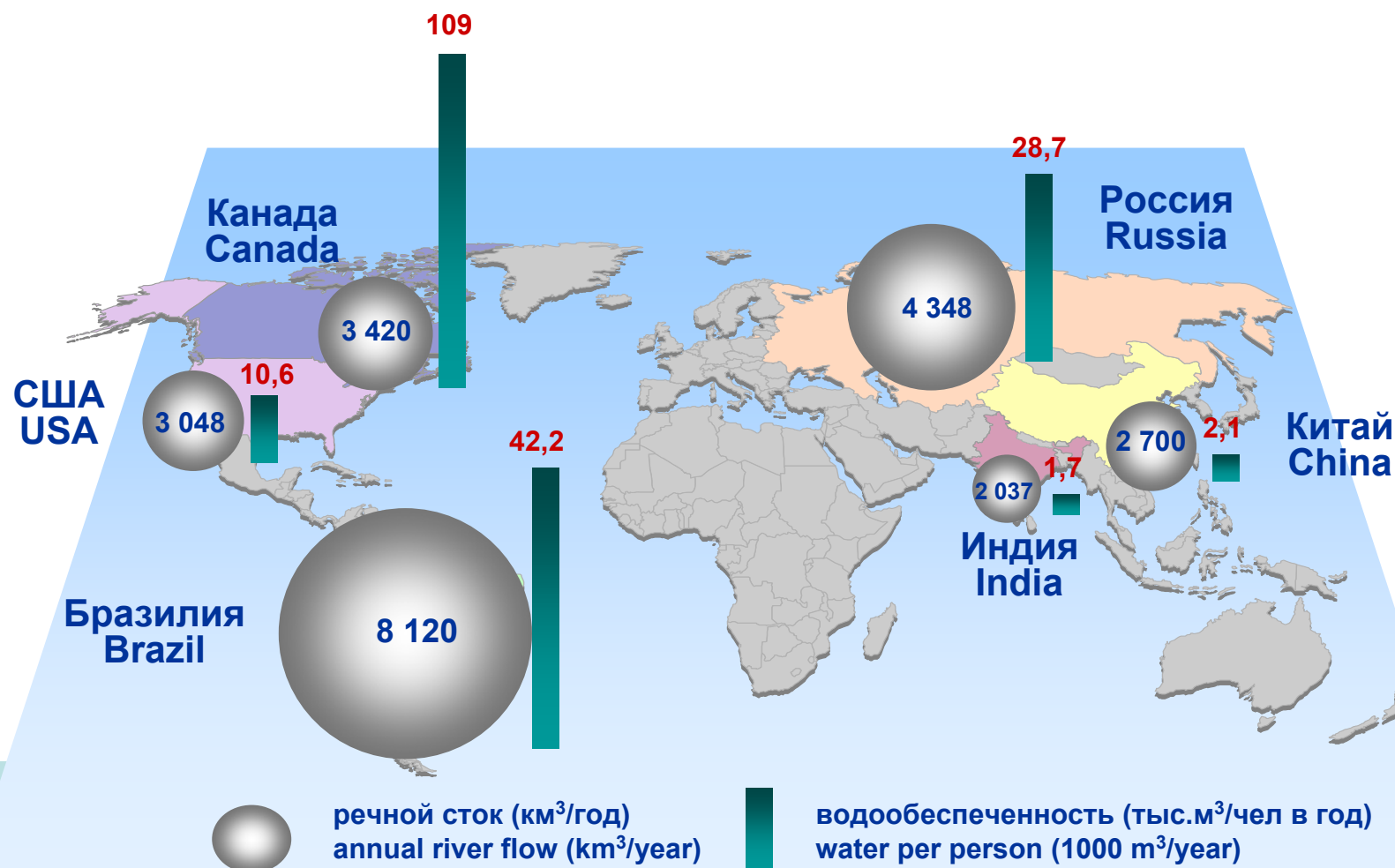
Center of Russian waterworks inventory and State water cadastre





# РЕЧНОЙ СТОК И ВОДОБЕСПЕЧЕННОСТЬ НАСЕЛЕНИЯ

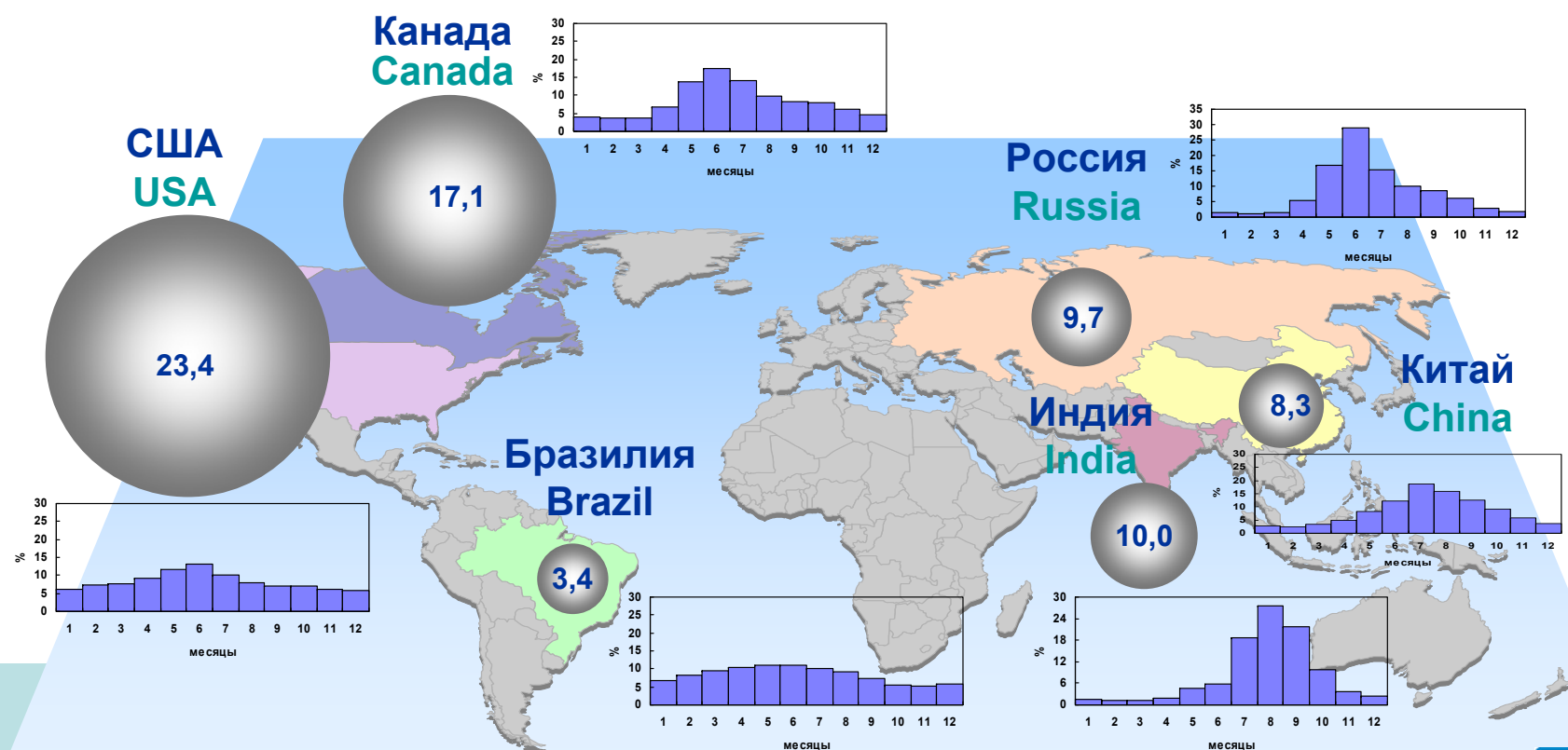
## MEAN ANNUAL RIVER FLOW





# Внутригодовое распределение и зарегулированность речного стока (%)

## Within-year variability and regulation degree of river flow (%)

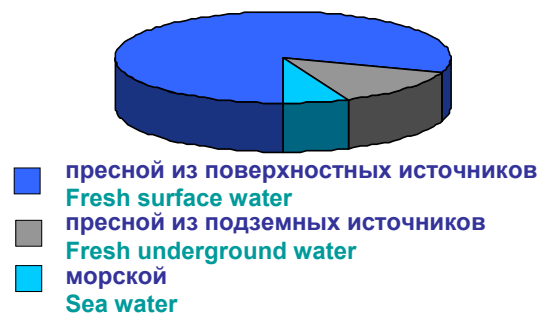




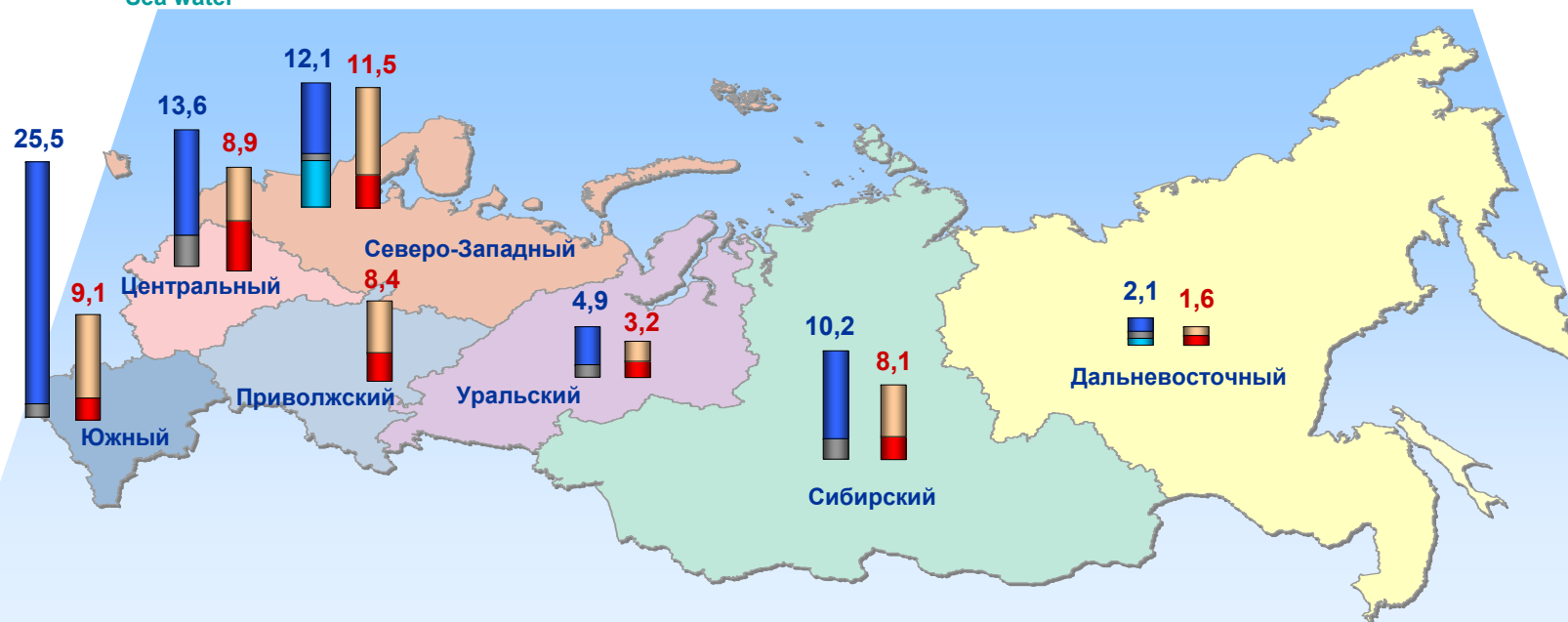
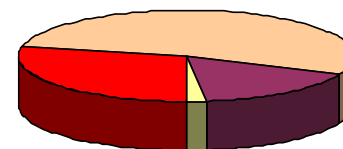
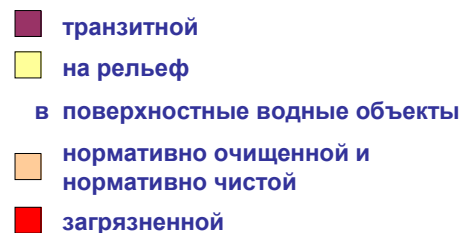
# Структура заборов и сбросов воды в России

## Water use in Russia

Забор воды  
*Water diversion* 79,5 км<sup>3</sup>



62,4 км<sup>3</sup> Сброс сточных вод  
*Sewage*





## ВОДОХОЗЯЙСТВЕННАЯ ИНФРАСТРУКТУРА *WATER INFRASTRUCTURE OF RUSSIA*

- ◆ 65 000 гидротехнических сооружений  
*hydraulic structures*
- ◆ 30 000 водохранилищ и прудов  
*water reservoirs*
- ◆ общая емкость водохранилищ  $> 800 \text{ км}^3$   
*total water reservoirs storage capacity*
- ◆ протяженностью каналов переброски  $> 3\,000 \text{ км}$   
*total length of water transfer canals*
- ◆ объемом перебрасываемого стока около  $17 \text{ км}^3$   
*annual volume of water transfer*
- ◆ 10 000 км защитных водооградительных дамб и валов  
*total length of flood dikes*







## ВОДНЫЕ ПУТИ РОССИИ NAVIGATION WAYS OF RUSSIA

- ◆ 100 000 км внутренних водных путей  
*total length of water ways*
- ◆ > 16 000 км искусственных водных путей  
*length of artificial water ways*
- ◆ > 700 судоходных ГТС  
*navigation hydraulic structures*





# ГИДРОТЕХНИЧЕСКОЕ СТРОИТЕЛЬСТВО *HYDRO CONSTRUCTION IN RUSSIA*

1700 – 1900 гг.



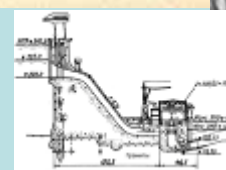
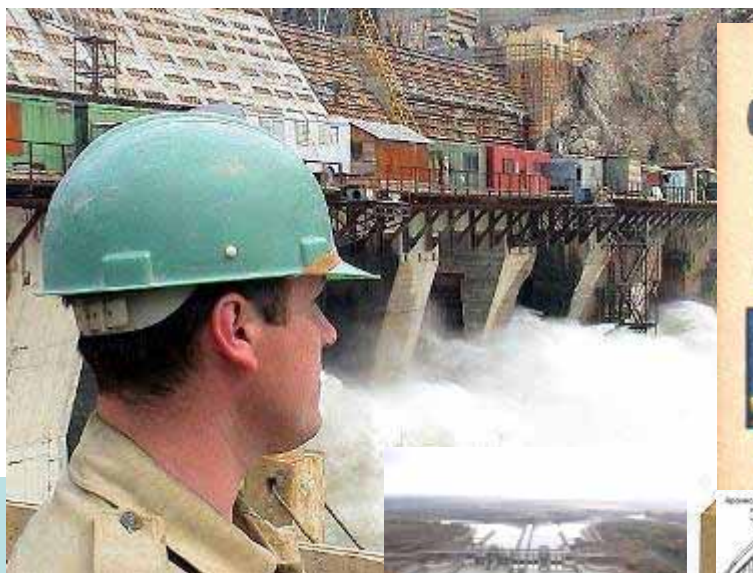
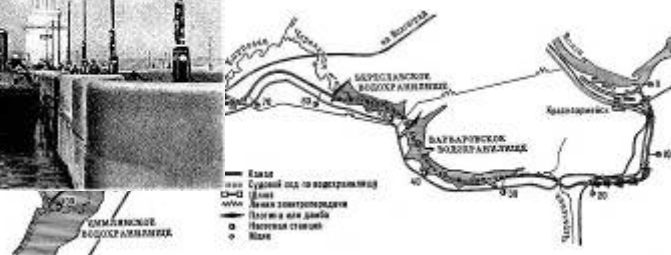




# ГИДРОТЕХНИЧЕСКОЕ СТРОИТЕЛЬСТВО *HYDRO CONSTRUCTION IN RUSSIA*



1930 – 2000 гг.

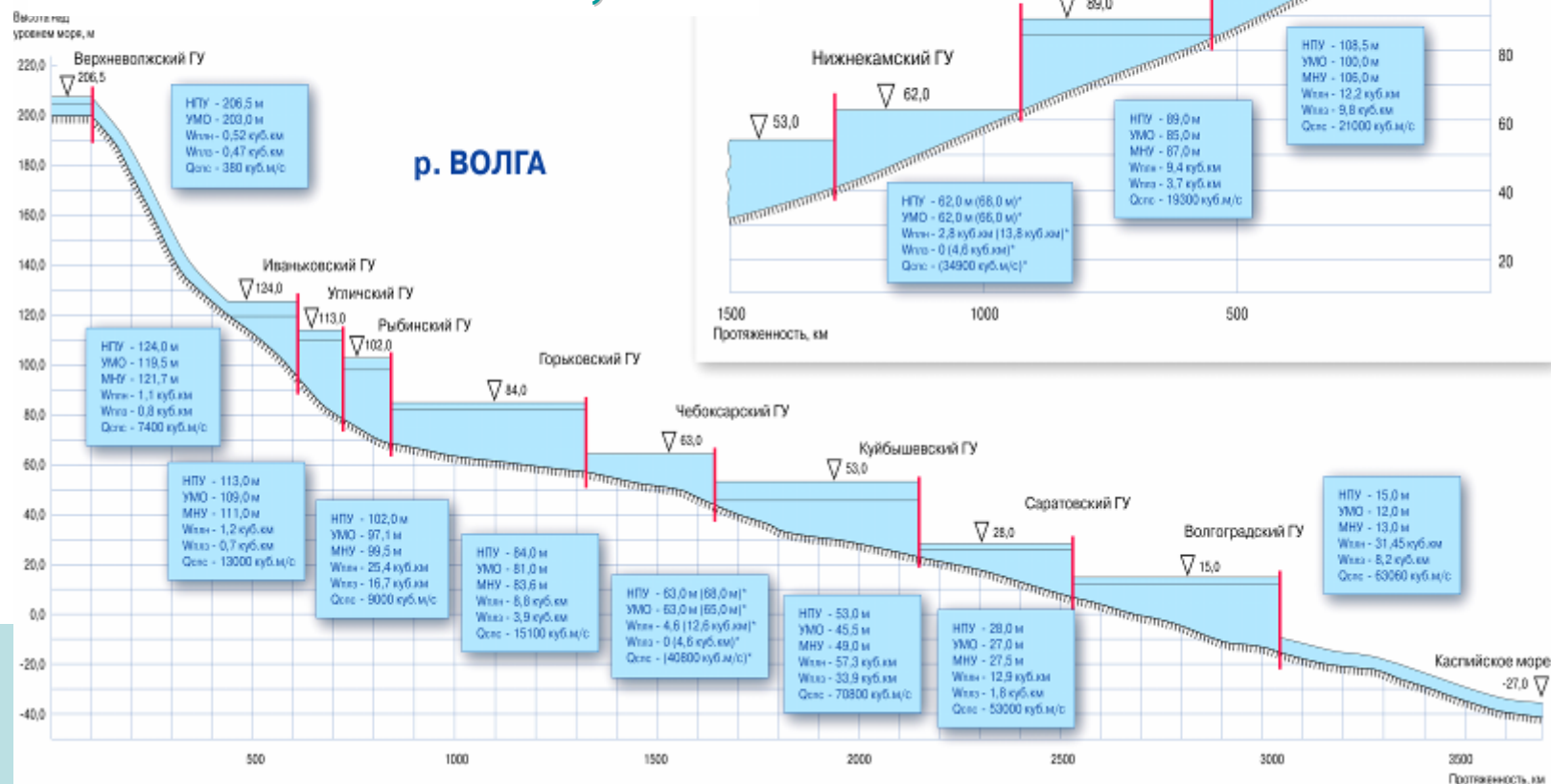






# ГИДРОТЕХНИЧЕСКОЕ СТРОИТЕЛЬСТВО HYDRO CONSTRUCTION IN RUSSIA

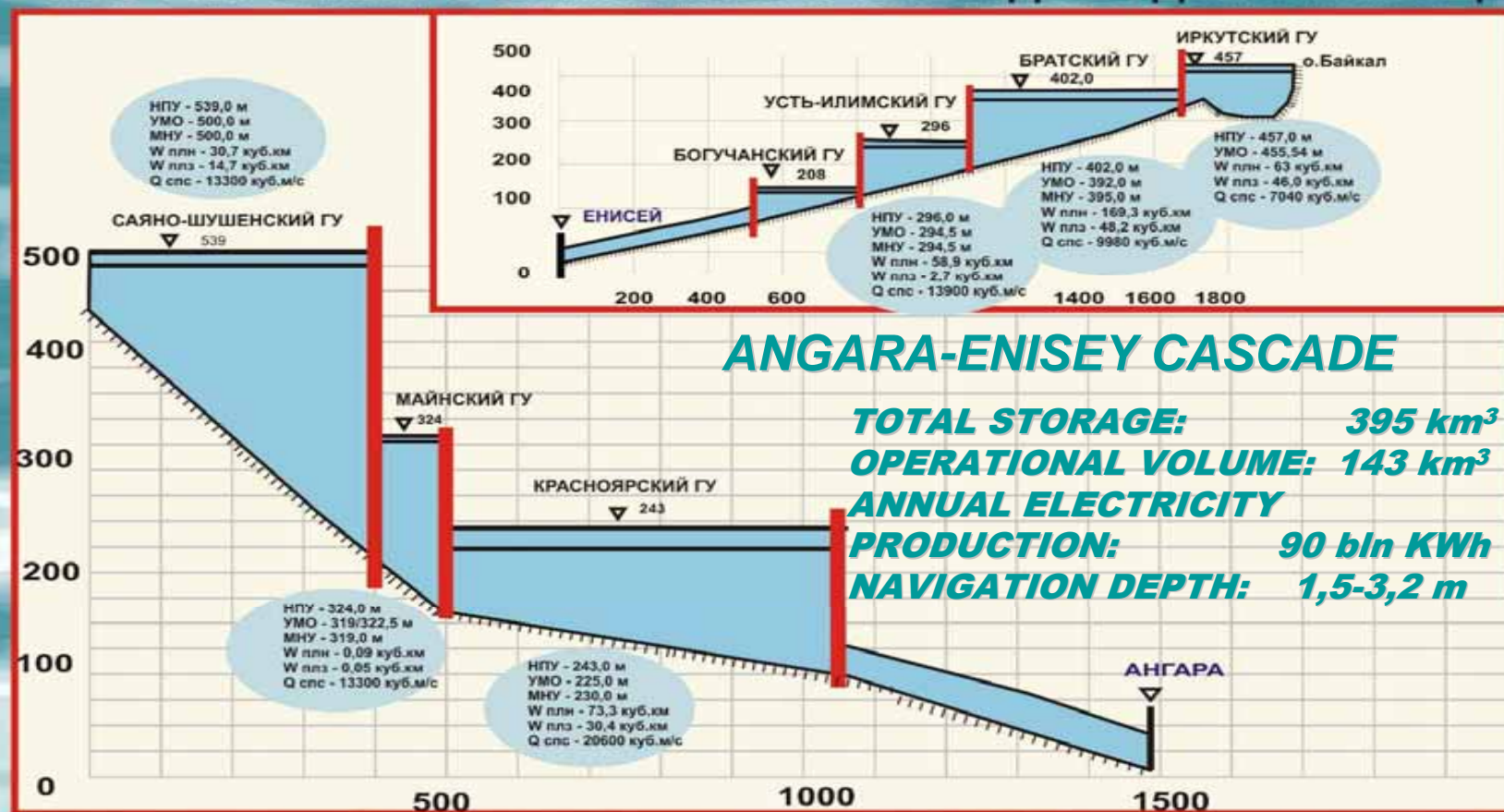
**TOTAL STORAGE:** 168 km<sup>3</sup>  
**OPERATIONAL VOLUME:** 80 km<sup>3</sup>  
**ANNUAL ELECTRICITY PRODUCTION:** 38 bln KWh  
**NAVIGATION DEPTH:** 4,0 m





# ГИДРОТЕХНИЧЕСКОЕ СТРОИТЕЛЬСТВО *HYDRO CONSTRUCTION IN RUSSIA*

## ПРОФИЛЬ АНГАРО-ЕНИСЕЙСКОГО КАСКАДА ВОДОХРАНИЛИЩ



## ANGARA-ENISEY CASCADE

**TOTAL STORAGE:** 395 km<sup>3</sup>  
**OPERATIONAL VOLUME:** 143 km<sup>3</sup>  
**ANNUAL ELECTRICITY PRODUCTION:** 90 bln KWh  
**NAVIGATION DEPTH:** 1,5-3,2 m

ГУ - Гидроузел  
НПУ - нормальный подпорный уровень,  
УМО - уровень мертвого объема

МНУ - минимальный навигационный уровень  
Wплн - полный объем  
Wплз - полезный объем

Qспс - суммарная пропускная способность гидроузла  
\* - проектные данные





# **NEW WATER CODE OF THE RUSSIAN FEDERATION**



**Federal Law of 03/06/2006 №74-FZ**

**Come into force 01/01/2007**

## **BASIN CONCEPT:**

**Article 3. Foundations of Water Legislation:**

**9) regulation of water relations within the  
boundaries of basin districts (basin approach)**

**Article 28. Basin districts:**

**1. Basin districts are the main management unit  
in the field of usage and protection of water bodies and  
consist of river basins and connected underground  
water bodies and seas.**

**2. In the Russian Federation twenty basin  
districts are established: ...**





# **NEW WATER CODE OF THE RUSSIAN FEDERATION (2)**



**Federal Law of 03/06/2006 №74-FZ**

**Come into force 01/01/2007**

## **BASIN CONCEPT:**

### **Article 28. Basin districts:**

**3. The boundaries of basin districts are approved in the order established by the Government of the Russian Federation**

### **Article 29. Basin Councils:**

**1. Aiming at ensuring rational usage and protection of water bodies the basin councils are formed, which develop recommendations in the field of usage and protection of water bodies within the boundaries of a basin district.**







# **NEW WATER CODE OF THE RUSSIAN FEDERATION (3)**



**Federal Law of 03/06/2006 №74-FZ**

**Come into force 01/01/2007**

## **BASIN CONCEPT:**

### **Article 29. Basin Councils:**

**2. The recommendations of the basin councils are taken into account in the process of developing schemes of integrated usage and protection of water bodies.**

**3. The Basin Councils include representatives of commissioned by the Government of the Russian Federation federal executive bodies, local governments, and also representatives of water users, public associations, communities of small nations of the North, Siberia and Far East ...**





# **NEW WATER CODE OF THE RUSSIAN FEDERATION (4)**



**Federal Law of 03/06/2006 №74-FZ**  
**Come into force 01/01/2007**

## **BASIN CONCEPT:**

**Article 32. Hydrographic and Hydro-economic zoning of  
the Russian Federation territory:**

**1. For the development of the schemes of  
integrated usage and protection of water bodies the  
hydrographic zoning of the Russian Federation territory  
are carried out.**

**2. Hydrographic units are presented by a river  
basin and a river subbasin of a river sinking into the  
main river of the river basin. The number of the  
hydrographic units and theirs boundaries are approved  
by the commissioned by the Government of Russian  
Federation executive body.**





# **NEW WATER CODE OF THE RUSSIAN FEDERATION (5)**



**Federal Law of 03/06/2006 №74-FZ**

**Come into force 01/01/2007**

## **BASIN CONCEPT:**

**Article 32. Hydrographic and Hydro-economic zoning of  
the Russian Federation territory:**

**3. For the development of water budgets the  
hydro-economic zoning of the Russian Federation  
territory are carried out – that is a partition of the  
hydrographic units into hydro-economic sections. The  
number of the hydrographic units and theirs boundaries  
are approved by the commissioned by the Government  
of Russian Federation executive body.**





# **NEW WATER CODE OF THE RUSSIAN FEDERATION (6)**



**Federal Law of 03/06/2006 №74-FZ**

**Come into force 01/01/2007**

## **BASIN CONCEPT:**

**Article 33. Schemes of integrated usage and protection  
of water bodies :**

**1. Schemes of integrated usage and protection of  
water bodies include integrated data on a state of  
water bodies and on their usage and they are the basis  
of an implementation of hydro-economic measures and  
measures on protection of water bodies, located within  
the bounders of river basins.**







# **NEW WATER CODE OF THE RUSSIAN FEDERATION (7)**



**Federal Law of 03/06/2006 №74-FZ**

**Come into force 01/01/2007**

## **BASIN CONCEPT:**

**Article 33. Schemes of integrated usage and protection  
of water bodies :**

**2. Schemes of integrated usage and protection of  
water bodies are developed aiming at:**

- 1) definition of allowable anthropogenic load on water  
bodies;**
- 2) definition of the requirements in water resources in  
the future;**
- 3) ensuring water objects protection;**
- 4) definition of mainstream activities on prevention of  
negative impact of waters;**





# **NEW WATER CODE OF THE RUSSIAN FEDERATION (8)**



**Federal Law of 03/06/2006 №74-FZ**

**Come into force 01/01/2007**

## **BASIN CONCEPT:**

**Article 33. Schemes of integrated usage and protection  
of water bodies :**

- 3. By the schemes of integrated usage and  
protection of water bodies are established:**
- 1) purposeful indexes of water quality in the water  
bodies for a time period of these schemes;**
  - 2) a list of hydro-economic and water bodies protection  
measures;**
  - 3) water budgets, ... within the boundaries of the river  
basins, subbasins, hydro-economy sections under  
different conditions... ;**





# **NEW WATER CODE OF THE RUSSIAN FEDERATION (9)**

**Federal Law of 03/06/2006 №74-FZ**

**Come into force 01/01/2007**

## **BASIN CONCEPT:**

**Article 33. Schemes of integrated usage and protection  
of water bodies :**

- 3. By the schemes of integrated usage and protection of water bodies are established:**
- 4) limits of water withdrawal from the water body and limits of releases of sewages, meeting quality standards, within the boundaries of the river basins, subbasins, hydro-economy sections under different water conditions;**
- 5) quotas of water withdrawal from the water body and quotas of releases of sewages, meeting quality standards, within the boundaries of the river basins, subbasins, hydro-economy sections under different water conditions;**





# **NEW WATER CODE OF THE RUSSIAN FEDERATION (10)**



**Federal Law of 03/06/2006 №74-FZ**

**Come into force 01/01/2007**

## **BASIN CONCEPT:**

**Article 33. Schemes of integrated usage and protection  
of water bodies :**

- 3. By the schemes of integrated usage and protection of water bodies are established:**
- 6) main purposeful indexes of the reduction of negative consequences of floods and other types of negative water impacts, list of the measures aiming at achieving this indexes;**
- 7) prospective financing needs for an implementation of the schemes of integrated usage and protection of water bodies.**







# **HYDROGRAPHIC AND HYDRO-ECONOMIC ZONING OF THE RUSSIAN FEDERATION TERRITORY**

**1 step. 1.1. Government regulation 30/11/2006 №728.**

**1.2. Principles of hydrographic zoning (adopted by the Ministry of natural resources and ecology of the Russian Federation, 25/04/2007 №112)**

**1.3. Guidelines on establishing basin districts boundaries.**

**1.4. Development of basin districts boundaries on the basis of GIS and DEM (includes: list of basin districts; log of the reference points; geographical description of the boundaries; maps).**

**1.5. Adoption of the basin districts boundaries (Ministry of natural resources and ecology of the Russian Federation, 11/10/2007 №265)**





# 20 BASIN DISTRICTS OF RUSSIA

Бассейновые округа на территории Российской Федерации





# **HYDROGRAPHIC AND HYDRO-ECONOMIC ZONING OF THE RUSSIAN FEDERATION TERRITORY**

**2 step. 2.1. Development of hydrographic zoning on the basis of GIS, DEM and hydrological data (includes for each of 20 basin districts: integrated list of hydrographic units; a set of maps; geographical description of the boundaries of hydrographic units; log of the hydrographic units boundaries reference points).**

**2.2. Adoption of the hydrographic zoning (Federal Agency of water resources, 05/09/2007 №117)**





# BASIN DISTRICTS AND RIVER BASINS (66 UNITS)

Бассейновые округа и гидрографические единицы речных бассейнов







# BASIN DISTRICTS AND RIVER SUBBASINS (85 UNITS)

Бассейновые округа и гидрографические единицы речных подбассейнов





# BASIN DISTRICTS AND UNIC HYDROGRAPHIC UNITS (133 UNITS)

Бассейновые округа и уникальные гидрографические единицы





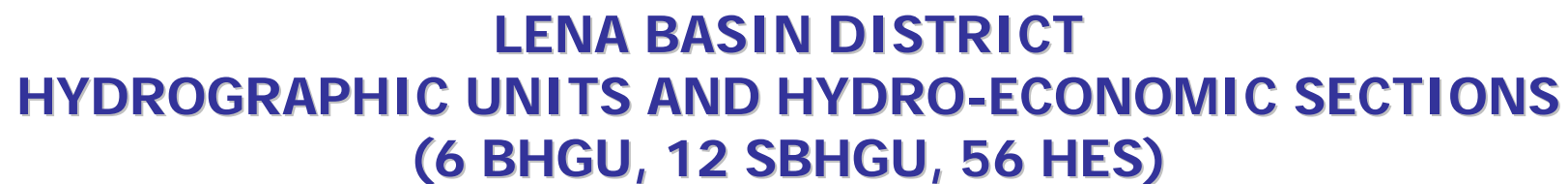
# **HYDROGRAPHIC AND HYDRO-ECONOMIC ZONING OF THE RUSSIAN FEDERATION TERRITORY**

**3 step. 3.1. Development of hydro-economic zoning on the basis of GIS, DEM, hydrological data, water use and water pollution data, socio-economic data (includes for each of 20 basin districts: integrated list of hydro-economic sections; a set of maps; geographical description of the boundaries of hydro-economic units; log of the hydro-economic units boundaries reference points). Total number of sections – 617.**

**3.2. Adoption of the hydrographic zoning (20 regulations of the Federal Agency of water resources , from 26/05/2008 to 31/07/2008, №№ 94-102, 134-136, 149-151, 158, 160-162)**







This is a detailed historical map of the Far East of Russia in 1905. The map is color-coded to show various administrative regions and provinces. Key geographical features include the Sea of Japan, the Korean Peninsula, and the Japanese archipelago. Major cities and towns are labeled in Russian, including Vladivostok, Khabarovsk, and Yekaterinburg. The map also shows the borders of neighboring countries like China and Japan. A grid of latitude and longitude lines is overlaid on the map, with coordinates marked along the edges. The map is titled 'ФАР-ВОСТОК' (Far East) in the top left corner.





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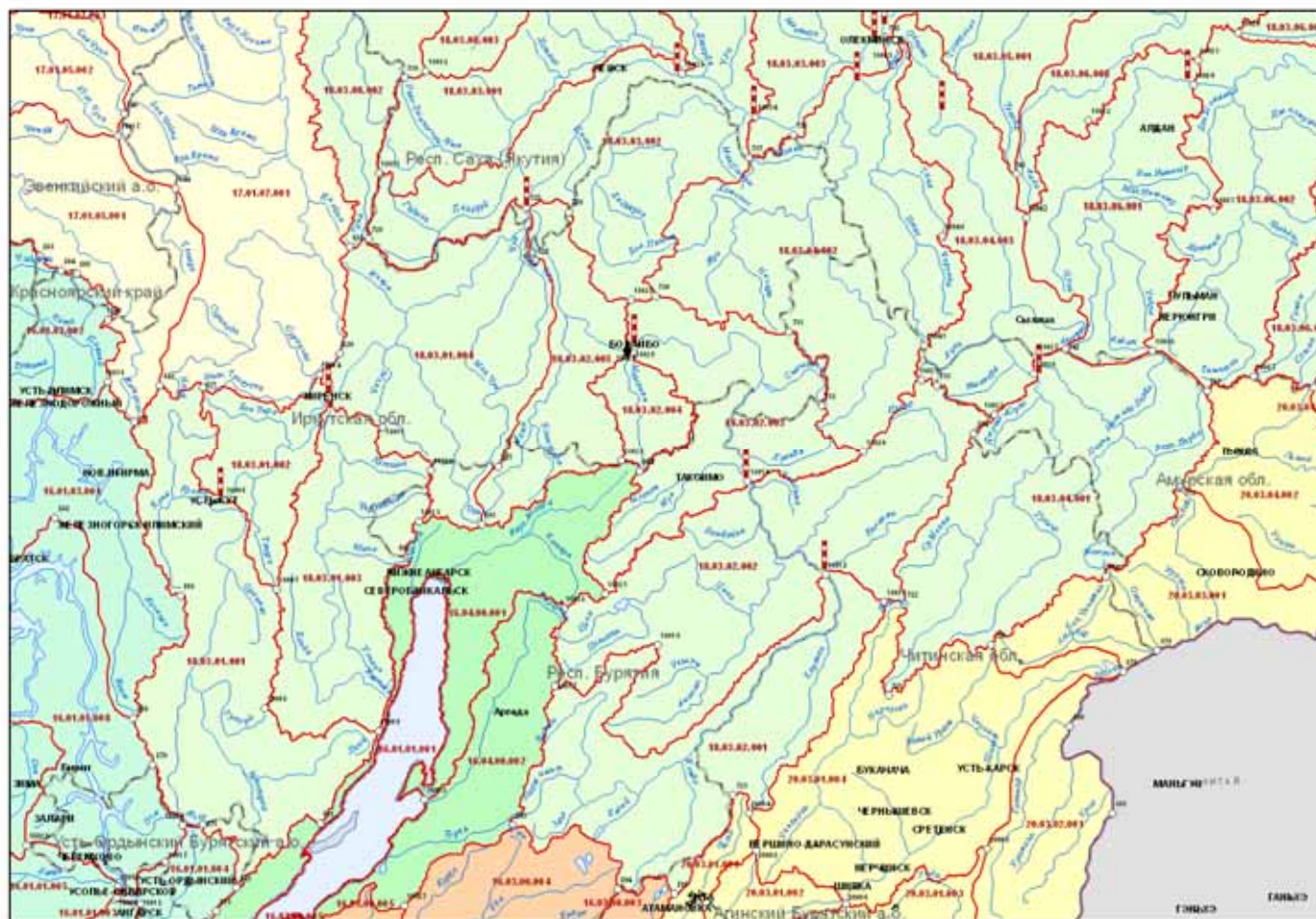






# LENA BASIN DISTRICT HYDROGRAPHIC UNITS AND HYDRO-ECONOMIC SECTIONS (MAP LIST 18.06)

Водохозяйственное районирование (лист 18.06)





## **DEVELOPMENT OF THE SCHEMES OF INTEGRATED USAGE AND PROTECTION OF WATER BODIES**

- 1. Government regulation 30/12/2006 №883.**
- 2. Guidelines on development of the schemes of integrated usage and protection of water bodies (approved 2007)**
- 3. Beginning of development for a few river basins (2008).**
- 4. Water strategy of the Russian Federation for the period up to 2020 (regulation of the Government of the Russian Federation 27/09/2009 №1235-p) – the schemes for all country river basins should be completed to 2015;**
- 5. The development of the first schemes should be completed in 2010.**





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**THANK YOU FOR YOUR**  
**ATTENTION!**

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