



International GNSS Monitoring and Assessment System: System-level

Bolkunov Alexey

Russian Federal Space Agency
Central Scientific-Research Institute for Machine building
PNT Information and Analysis Center



IGMA Status and Current Results

- Was established on 2011
- Produced various recommendations
- Has a project of Parameters Matrix



IGMA Goals and Plans

- Distant goal – to establish International GNSS Monitoring and Assessment System
 - Define status, structure, parameters, calculation methods, participating organizations, technical means
- Current plans – to finish Parameters Matrix



Proposals on IGMA's Terms of Reference

- Description of IGMA and it's place among the other monitoring and assessment systems
- The list of monitored parameters for IGMA System
- The calculation methods for above parameters
- Reference data validation procedures
- Other GNSS monitoring and assessment systems results' validation procedures
- Cooperation principles with other GNSS monitoring and assessment systems
- IGMA's technical means

Recommendation 1



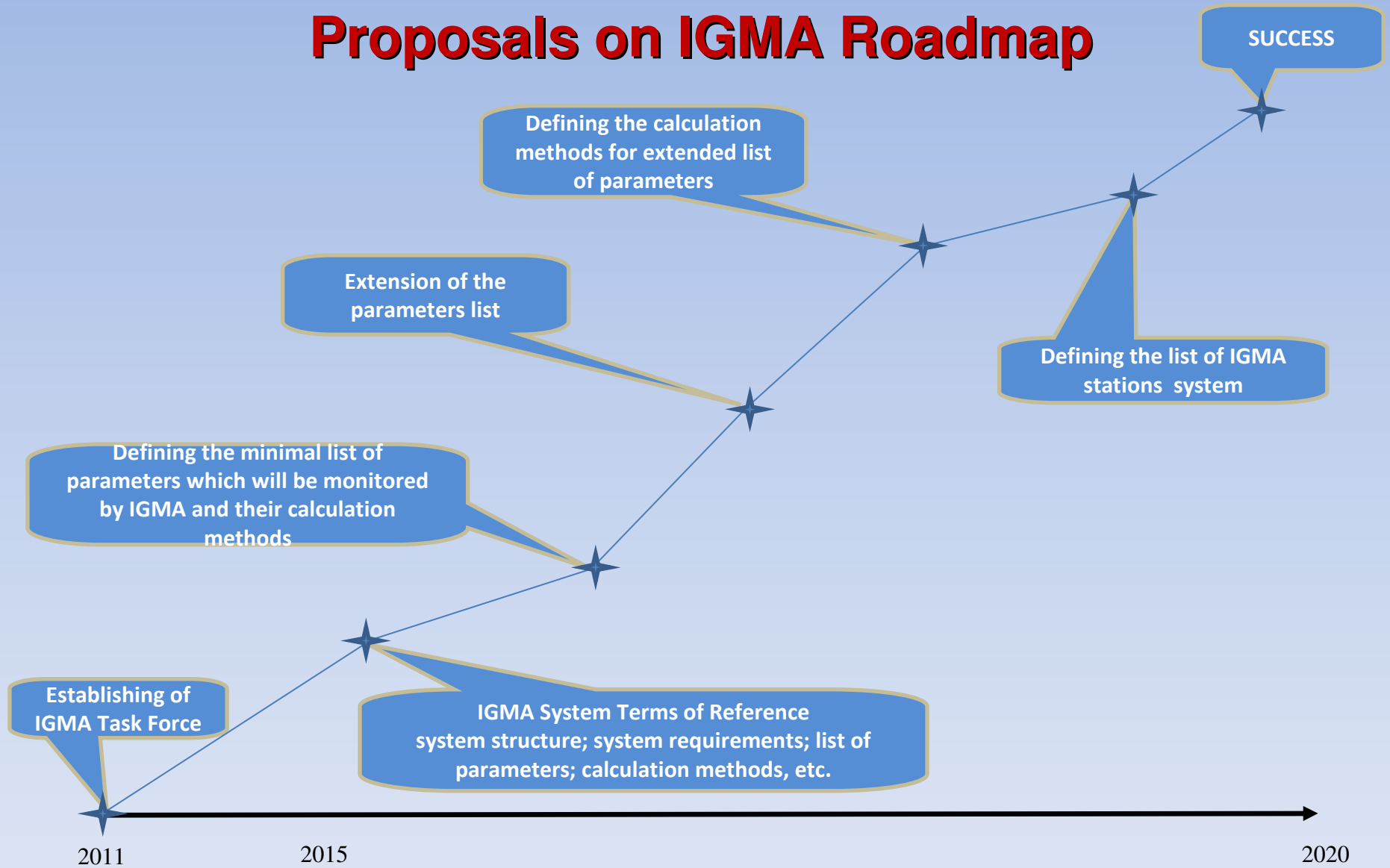
Proposals on Parameters Matrix Development

- Advanced monitoring – Parameters Matrix
 - As the future of monitoring – all that can be monitored using all possible technical means
- Short list of parameters (GNSS OS PPS-based)
 - As starting point for IGMA work

Recommendation 2



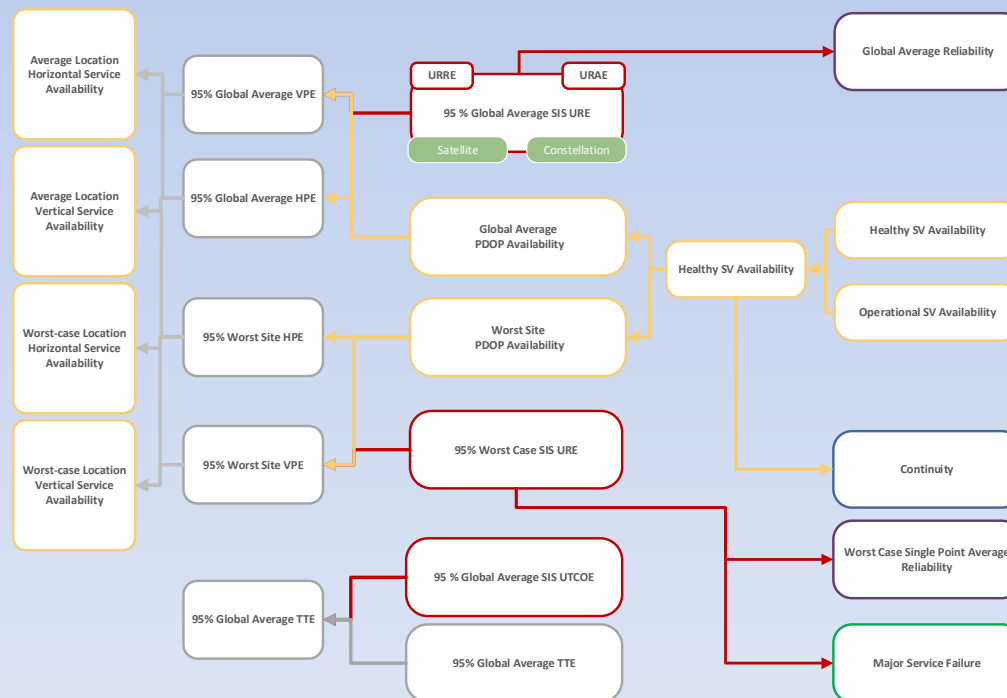
Proposals on IGMA Roadmap





Proposals on Parameters Calculation Methods

- Calculation methods for GNSS Open Service Performance Standard were developed



Recommendation 3



IGS IGMA Pilot Project Proposal Analysis

- Technical means used
 - IGS-RT stations, MGEX stations, additional stations from providers
 - Calibration
 - Reference data
- Parameters used
 - Parameters Matrix
 - Calculation methods
- Operation Mode
 - Real Time or post processing



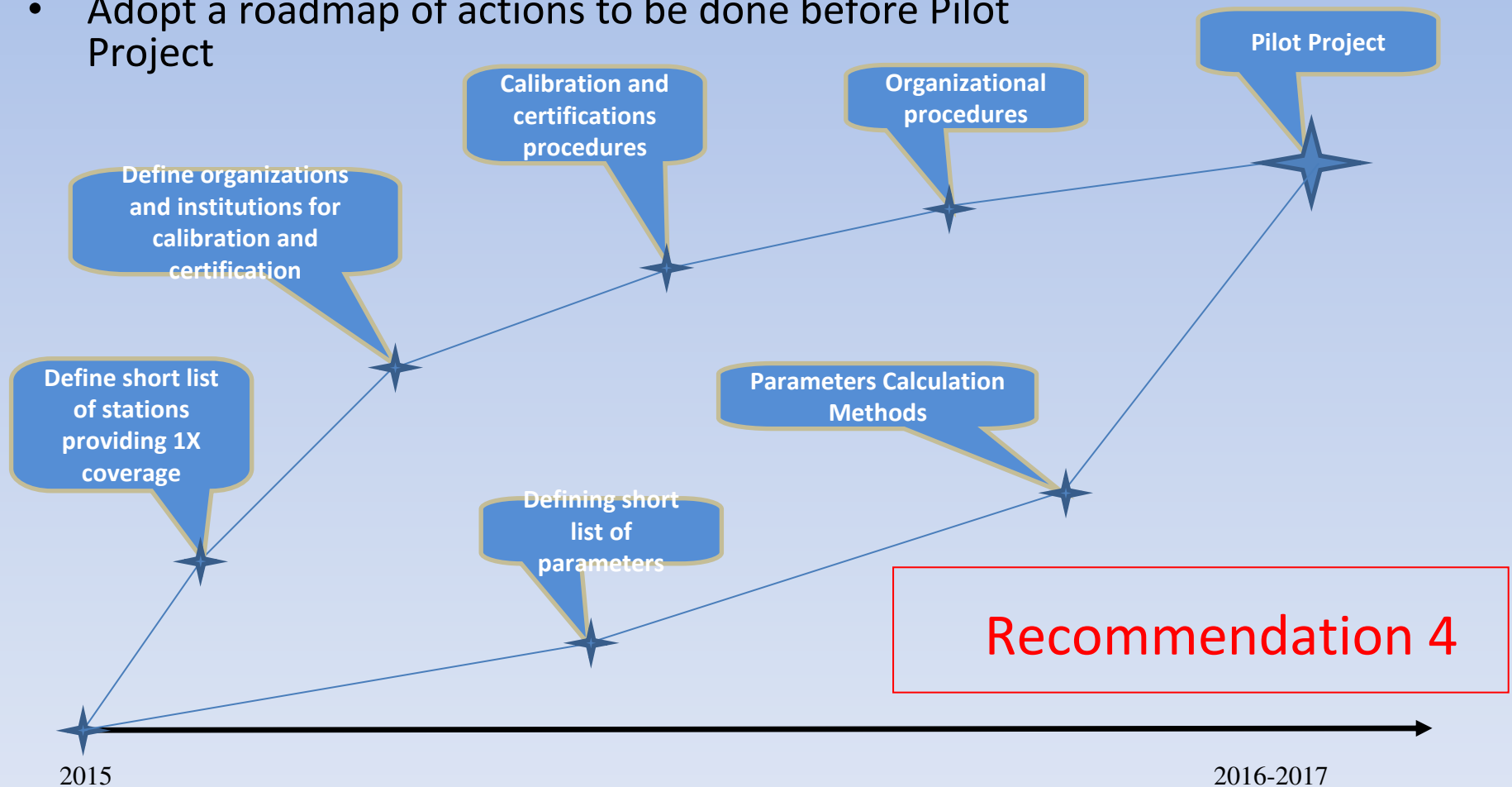
Problems of IGS IGMA Pilot Project

- Various station types
 - Various navigation equipment, antenna systems lead to errors due to
 - Reference data errors
 - Uncalibrated equipment errors
 - Parameters
 - No agreed parameters list
 - No calculation methods



Proposals on IGS IGMA Pilot Project

- Postpone Pilot Project for a year
- Adopt a roadmap of actions to be done before Pilot Project





Way Forward

Matrix

Divide research trend on
Advanced monitoring
and Creating short list of
parameters

IGMA WG

IGMA Terms of Reference

IGS IGMA Pilot Project

To postpone a Pilot Project
for a year; to conduct
series of actions to boost
its effectiveness

To start harmonization of
parameters calculation
methods (based on GNSS OS
PPS Parameters)



Recommendations

- Recommendation 1 – To create and adopt IGMA Terms of Reference. To use template proposed by Russia as basis.
- Recommendation 2 – Divide research trend on Advanced monitoring and Creating short list of parameters. To focus on creating Parameters Matrix for future monitoring needs in Advanced monitoring. To focus on creating GNSS OS PPS-based parameters list that can be harmonized fast enough in Creating short list of parameters
- Recommendation 3 – To start harmonization of parameters calculation methods for GNSS Open Service Performance Standard. To use calculation methods proposed by Russia As a basis.
- Recommendation 4 – To postpone a Pilot Project for a year; to conduct series of actions during this year, including: defining short list of stations providing 1X coverage (just to provide the possibility of collecting all measurements from all satellites); defining organizations and institutions for calibration and certification procedures (I mean calibration and certification for station's navigation equipment, antenna systems and so on); conducting of various organizational procedures; defining of monitoring parameters short list and parameters calculation methods.



Contacts

Bolkunov Alexey

Senior Research Associate

Russian Federal Space Agency
Central Scientific-Research Institute for Machine building

Positioning, Navigation and Timing Information and Analysis Center

Alexei.Bolkunov@glonass-iac.ru

www.glonass-center.ru

tel/fax: + 7 495 513 4576