Došlo na právní oddělení ČZU dne:

1 8. 12. 2020

WORKS CONTRACT
(hereinafter referred to as the "Contract")

*entered into in the sense of Article 2586 et seq. of Act 89/2012 Coll., the Civil Code, as amended
(hereinafter referred to as the "Civil Code")
by and between*

I.
Contracting Parties

1.1 Client: **Czech University of Life Sciences Prague**

Registered Office:	Kamýcká 129, 165 00 Prague– Suchdol
Acting by:	Ing. Jakub Kleindienst, Bursar
Bank Account:	Česká spořitelna, a. s.
Account Number:	xxxx
Company Reg. No.:	60460709
VAT No:	CZ60460709

(hereinafter referred to as the "Client") on the one hand

a

1.2 Contractor: **Technical University of Munich (TUM)**

Registered Office:	Arcisstrasse 21, 80333 München, Germany
Acting by:	Prof. Dr. Rupert Seidl
Bank Account:	UniCredit Bank - HypoVereinsbank
Account Number:	xxxx
Company Reg. No.:	NA
VAT No.:	DE811193231

TUM is a public body, controlled by the Bavarian Ministry of Science and Arts (Bayerisches Staatsministerium für Wissenschaft und Kunst)
(hereinafter referred to as the "Contractor") on the other hand

(collectively also referred to as the "Contracting Parties")

on the basis of the result of a Tender for the performance of a small-scale public contract entitled "Development of a program for the simulations of impacts of various biotic disturbance agents on the forest with an interface to an existing ecosystem model", performed as a small-scale public contract pursuant to Article 27 of the Act and in accordance with the procedure stipulated in Article 31 of Act 134/2016 Coll., on the awarding of public contracts, as amended, as follows:

II.
Subject of the Contract

2.1   On the one hand, the subject of the Contract shall be Contractor's obligation to complete the work consisting of programming (hereinafter referred to as the "Work").

2.2   The Contractor declares that it is directly or on the basis of valid contractual relations with third parties entitled to provide/supply the Client with software, provide licenses for its use, at least to the extent specified herein and in the Attachment hereto, and that its use as specified herein shall not violate personal or proprietary copyrights of third parties. License means a license of a program product in the sense of copyright law, i.e. a non-exclusive right to exercise the right to use the program product, in all manners of normal use

(including the making of backup copies). The program shall be provided as an unlimited license for an unlimited number of users.

2.3 On the other hand, the subject of the Contract shall be the Client's obligation to take over the duly and timely completed work and pay the Contractor the agreed price for its execution in the amount and in the manner further specified herein.

III.
Time and Place of Performance

3.1 The Contractor shall undertake to perform the Work within the following deadlines:

Start of Work: Immediately after the effective date of the Contract (expected date in August 2020)

End and handover of the Work: within 6 months from the effective date of the Contract

3.2 The place of delivery shall be the registered office of the Client at Kamýcká 129, 165 00 Prague– Suchdol.

IV.
Price and Payment Conditions

4.1 The price for the Work to the extent agreed to herein and under the conditions specified herein is determined by agreement of the Contracting Parties in accordance with Act 526/1990 Coll., on prices, as amended, and is based on the Contractor's price offer.

4.2 The Client shall undertake to pay the Contractor the agreed price for the performance of the Work according to paragraph 2.1 herein in the amount of 21,500 EUR without VAT (in words: twenty-one-thousand-and-five-hundred). VAT shall be determined and paid according to the valid legal regulations.

4.3 The price is agreed as the highest permissible. The price shall include any and all costs ensuring the proper performance of the subject of the Work, including transport costs, costs of all media, means and tools used in the performance of the Work, and performance related to the implementation of the Work, etc., as well as any and all fees that are applicable by laws, regulations and that are required by the regulations to fulfil contractual obligations, including performances that are not expressly stated herein, but which the Contractor, with regard to its professional knowledge and with the exercise of all due professional care, knew about or should have known about. The price shall include 30 hours of training, which may take place in person or virtually no later than 3 months after the completion and delivery of the Work.

4.4 The price for the Work shall be paid by the Client in EUR on the basis of a tax document - invoice, by non-cash transfer.

4.5 The price for the Work shall be paid by the Client in EUR on the basis of a tax document - invoice, by non-cash transfer. The Contractor shall be obliged to issue an invoice within 15 days after the proper and timely delivery and acceptance of the Work, or after the elimination of any defects and unfinished work found in the handover procedure, on the basis of the handover protocol.

4.6 Tax document - the invoice must contain all the requisites of a proper accounting and tax document in the sense of the relevant legal regulations, especially Act 235/2004 Coll., on value added tax, as amended. The invoice must also indicate the project and operational programme from which the Work is financed: **"Excellent research to support the adaptation of forestry and lumbering to global change and the 4th industrial revolution" (CZ.02.1.01/0.0/0.0/16_019/0000803) is co-financed by the European Union"**. In the event that the invoice does not have the appropriate details, the Client shall be entitled to return it to the Contractor for completion within the due date, without delay. The due date shall begin to run again from the delivery of a duly completed or corrected invoice to the Client.

4.7   The maturity of the tax document (invoice, including proforma invoices) shall be at least 30 days from the date of its delivery to the Client. The Contractor shall be obliged to deliver the invoice electronically to the e-mail address: hlasny@fld.czu.cz and projects_ffws@fld.czu.cz within 3 working days of its issuance. In the event of later delivery, the Client shall be entitled to request a reasonable extension of the invoice. Any other form of delivery shall not be considered correct, provided that the Client is not obliged to pay the invoice delivered in another way.

4.8   The day of payment shall be considered to be the day of debiting the invoiced amount from the Client's bank account to the Contractor's bank account.

4.9   The price for the Work shall be transferred to the Contractor's bank account published by the tax administrator pursuant to Article 98 of Act 235/2004 Coll., on value added tax, as amended, even if another bank account is indicated on the invoice. In the event that the Contractor does not have a bank account published by the tax administrator pursuant to Article 98 of Act 235/2004 Coll., on value added tax, as amended, the Client shall make the payment to the bank account only after its publication by the tax administrator without the Client being in arrears. The Contractor shall immediately notify the Client of the publication of the bank account by the tax administrator.

4.10 In the event that, at the time of the Contractor's taxable performance, the relevant tax administrator publishes information that it is an unreliable payer of VAT, the Client, as guarantor, shall reserve the right to reduce the amount provided to pay the price of the Work to the Contractor stated herein by the amount corresponding to the VAT. The Client shall be obliged to notify the Contractor of this fact in advance. By applying this procedure, the Contractor's receivable from the Client shall be reduced by the relevant amount of VAT and the Contractor shall not be entitled to recover the amount corresponding to the amount of VAT from the Client in any way.

V.
Performance of the Work and Other Provisions

5.1   The Contractor shall be obliged to perform any and all acts and activities for the Client in order to duly complete the Work and within the agreed deadline for use by the Client, under the conditions agreed herein, and the Client undertakes to provide the necessary cooperation.

5.2   The Contractor confirms that it is fully acquainted with the specifications and scope of the Work, especially according to the tender conditions. It is familiar with the technical, qualitative and other conditions necessary for the performance of the Work and has the professional knowledge, experience and capacity necessary for the performance of the Work. The Contractor undertakes to perform the Work in accordance with the contract, generally binding legal regulations, technical standards and that it will have the properties and quality corresponding to the usual purpose of the Work. The Contractor shall be obliged to proceed with professional care and to observe all standards observed in the given field.

5.3   The Contractor shall be liable for damages incurred by the Client and third parties by a breach of the Contractor's obligations specified herein or by a breach of legal regulations and standards.

5.4   The Contracting Parties have agreed that any part or parts of the work made by the Contractor, if it is no longer the property of the Client, shall pass directly into the ownership of the Client at the time of completion (processing).

5.5   The Client's authorized representative shall have the right to continuously inspect the performance of the Work and if he/she finds that the Contractor is performing the work in violation of the Contract or technical standards, legal regulations or decisions of public authorities, he/she shall immediately notify the Contractor of this fact. The Contractor shall be obliged to seek an immediate remedy. In the event that the Contractor fails to do so, the Client shall be entitled to withdraw from the Contract.

VI.
Handing Over and Acceptance of the Work, Elimination of Defects

6.1 The Contractor shall fulfil its obligation to perform the Work by its proper completion and handover of the Work in the handover procedure to the Client at the place of performance after the proper completion of the Work. The handover procedure shall be completed by a protocol on the handover and acceptance of the Work, which will be signed by the authorized representative of the Client and of the Contractor. Otherwise, the Work shall not be considered submitted duly and on time. The protocol on the handover and acceptance the Work shall also include a list of defects and/or unfinished works that do not prevent the proper use of the Work, with an agreed date for their removal. A defect means a deviation in the quality and parameters of the Work. Unfinished work means work not completed.

6.2 The performance of the contract shall be demonstrably handed over in an electronic form (e.g. a download link, flash disk, CD, etc.), including the source codes for the subject of performance

VII.
Warranty

7.1 The Contractor shall take over the warranty for the subject of performance for a period of 24 months. The warranty period shall begin on the day of delivery of the subject of performance to the Client, i.e. on the day of signing the handover protocol by the Client. During this period, the Contractor shall be obliged to regularly update the program.

7.2 The Client shall be obliged to notify the Contractor of warranty defects in writing without delay. Warranty repairs will be performed by the Contractor free of charge within a maximum of 3 working days from the notification of the defect, or the Contractor shall agree with the Client on a different time to eliminate the claimed defect. In the event of a non-compliance with this implementation deadline, the Client shall also be entitled to have the defect eliminated by a third party at the expense of the Contractor, even without prior notice to this fact.

7.3 In the case of repairs during the warranty period, this is extended by the time from the notification of the defect by the Client to its removal by the Contractor, or a third party at the expense of the Contractor in the sense of the last sentence of Article 7.2., herein.

7.4 Complaints can be made no later than the last day of the warranty period, and a complaint sent on the last day of the warranty period shall be considered to have been submitted in time.

VIII.
Sanctions

8.1 The Contractor shall be obliged to pay the Client a contractual penalty in the amount of 0.5% of the price for the Work for each day of delay in completing and handing over the work within the deadline agreed herein. The Work shall be considered to be completed and handed over by the signing of a protocol on the handover and acceptance of the Work by the authorized representatives of both Contracting Parties.

8.2 The Contractor shall be obliged to pay the Client a contractual penalty in the amount of 0.05% of the price for the Work for each day of delay in removing defects and unfinished work found in the handover procedure within the agreed period. In the event that the defect concerns only a part of the Work, the basis for the calculation of the contractual penalty according to the previous sentence shall only be the price corresponding to the given part of the Work. The Client is entitled to demand payment of contractual penalties from the Contractor up to a maximum of 20% of the total price of the subject of the Contract.

8.3 In the event of a delay by the Client in paying the invoice, the Contractor shall be entitled to claim from the Client contractual interest on arrears to the amount of 0.05% of the amount due for each day of delay in payment of the invoice.

8.4 The Client shall be entitled to unilaterally set off any contractual penalty against any receivable of the Contractor from the Client (including the receivable of the Contractor for payment of the price for the Work).

8.5 Payment of the contractual penalty shall not affect the Client's right to compensation in full.

IX.
Validity and Effectiveness of the Contract

9.1 This Contract shall become valid on the date of signature by the authorized representatives of both Contracting Parties. This Contract shall become effective by its publication in the register of contracts pursuant to Act 340/2015 Coll., on special conditions for the effectiveness of certain contracts, publication of these contracts and the register of contracts (Act on the Register of Contracts), as amended.

9.2 The Contract may be terminated by written agreement of the Contracting Parties.

9.3 Withdrawal from the Contract shall be possible only on the grounds stipulated herein or by law.

9.4 The Client shall be entitled to withdraw from the Contract without any sanctions, especially in cases where:

- The Contractor will be in delay with the delivery of the work compared to the agreed date,

- The work or a substantial part thereof (more than 15%) will not be delivered by the Contractor in the agreed quality or in the usual quality of the work,

- In the event that the Contractor proceeds with the performance of the work in violation of the provisions specified herein, with the instructions of the authorized representative of the Client, or with legal regulations.

9.5 The Client shall be entitled to withdraw from the Contract in the event that according to the data provided in the register of VAT payers, the Contractor becomes an unreliable payer of VAT.

9.6 The Contractor shall be entitled to withdraw from this Contract in the event that the Client is in arrears with the payment of the invoice by more than 30 days from the due date of the invoice for the execution of the work.

9.7 In the event of withdrawal from the Contract by either of the Contracting Parties, the Contractor shall be obliged to hand over to the Client the part(s) of the Work performed thus far, as well as unfinished part(s) of the Work by the effective date of withdrawal. A protocol on the handover and acceptance shall be prepared, which will be signed by the Client and the Contractor, and a report of the work actually performed shall also be a part of this protocol.

9.8 Upon termination or expiration of the Contract, any and all obligations of the Contracting Parties from the Contract shall also expire. Termination of the Contract shall not terminate claims for damages and payment of contractual penalties agreed in the case of a breach of contractual obligations arising before the termination of this Contract, and obligations of the Contacting Parties, which according to the Contract or by its nature should continue or as provided by law.

X.
Final Provisions

10.1 In addition to the representatives referred to in paragraphs 1.1 and 1.2 herein, the following persons shall be authorized to act in mutual relations between the two Contracting Parties in matters related hereto, and mainly in the operational and technical management of activities during the performance of the work, in the

confirmation of records on the fulfilment of conditions for the release of payments, confirmation of records on the handover and acceptance of the work or part thereof:

On behalf of the Client: xxxx
                         e-mail: xxxx
                         tel.:   +xxxx

                         Ing. xxxx
                         e-mail: xxxx tel.: xxxx

On behalf of the Contractor: xxxx
                         e-mail: xxxx tel.:   xxxx

10.2 Relations between the Contracting Parties shall be governed by Czech law. In matters not expressly regulated by the Contract, the legal relations arising from and resulting from it shall be governed by the relevant provisions of the Civil Code and other generally binding legal regulations.

10.3 Any and all changes or additions to the contract may only be made by written agreement of the Contracting Parties. Such agreements must take the form of dated, numbered and signed addenda to the contract signed by both Contracting Parties.

10.4 In the event that the grounds for invalidity relate only to some provision of the Contract, only that provision shall be invalid, unless its nature, content or the circumstances in which it was agreed show that it cannot be separated from the remaining content of the Contract.

10.5 The Contracting Parties shall strive to find an amicable settlement of any and all disputes arising from the Contract. If an amicable settlement of the dispute has not been reached within 30 working days of its first notification to the other Contracting Party, either Contracting Party shall be entitled to bring its claim before the competent court.

10.6 The Contractor unconditionally agrees with the publication of the full text of the contract so that this contract may be the subject of the information provided in the sense of Act 106/1999 Coll., on free access to information, as amended. The Contractor also agrees to the publication of the full text of the Contract pursuant to Article 219 of Act 134/2016 Coll., on the awarding of public contracts, as amended, and pursuant to Act 340/2015 Coll., on special conditions of effectiveness of certain contracts, publication of these contracts and on the Register of Contracts (Act on the Register of Contracts), as amended.

10.7 The Contractor acknowledges and agrees that it shall be the liable person in the sense of Article 2(e) of Act 320/2001 Coll., on financial control, as amended. The Contractor shall be obliged to fulfil its obligations as the liable person pursuant to the foregoing law.

10.8 The Contract shall be prepared in 4 (four) counterparts, each of which having the validity of the original and with each of the Contracting Parties receiving 2 (two) copies thereof. In the event that the Contract is concluded in electronic form, including its signature, it shall be prepared in one copy only.

10.9 The Contracting Parties declare that they have read the Contract before signing it and agree with its content without reservations. The Contract is an expression of their true, real, free and serious will. To prove the authenticity and veracity of these declarations, the authorized representatives of the Contracting Parties hereby attach their handwritten signatures.

Done in Prague, date 30.11.2020

Done in Freising, date 09.12.20

On behalf of the Client:
Czech University of Life Sciences Prague

On behalf of the Contractor:
Technical University of Munich

Technische Universität München

Lehrstuhl für Ökosystemdynamik und
Waldmanagement in Gebirgslandschaften

Hans-Carl-von-Carlowitz-Platz 2, D-85354 Freising
Tel.: +49.8161.71.4690 / Fax: +49.8161.71.4616

Ing. Jakub Kleindienst
Bursar

Prof. Dr. Rupert Seidl

Prověřeno právním odd. ČZU v Praze

Specification of the Subject of Performance

Name of the service: Development of a program for the simulations of impacts of various biotic disturbance agents on the forest with interface to an existing ecosystem model

Requested activities – description, quantification (e.g. number of samples, forest area), time schedule, etc.)

Development of specific program for the simulation of the impacts of a broad range of biotic disturbances on the forest based on the most recent scientific understanding of ecology of these agents. The biotic disturbances will include fungi, insects (wood and bark borers and defoliators), and small and large mammals (i.e. five agents at minimum). The program will include an interface that will allow for its full integration with an existing ecosystem model.

The program will be coupled with the forest landscape and disturbance model iLand (http://iland.boku.ac.at/). The model iLand is freely available and licenced under the GPL open source licence. iLand is written in C++ and relies on the open source toolkit Qt (http://qt.io). Furthermore, iLand uses a JavaScript engine internally, that allows script-based access to many internal functions of the model. For example, forest management is defined as JavaScript code which gives the model user a high degree of control over details of the management implementation.

The integration of the new program and iLand should allow biotic agents to affect individual trees in the ecosystem model (e.g., kill or defoliate trees) and to retrieve information at a specific location about the current state of the vegetation (e.g., availability of host species, tree dimensions) or other environmental conditions (e.g., climate data). Achieving such an integration without sacrificing computational performace requires a tight technical integration of the new model into iLand. The development of the new software fully integrated and compatible with C++/Qt is therefore mandatory and advanced knowledge about the technical foundations of iLand is requried.

Moreover, the biotic disturbance program needs to be highly flexible with regard to the definition of the behavior of the biotic disturbance agents. Ideally, this flexibility is achieved by facilitating a scripting-based approach that leverages the built-in JavaScript engine of iLand.

The software will need to be designed with the following key characteristics:

- Processes: The biotic disturbance program needs to include the processes of introduction, dispersal, colonization, population dynamics, and impact (note that not all processes are applicable for each agent)
- Spatial resolution: the biotic disturbance model runs on a grid with a variable spatial resolution that should range from 10m to km.
- Temporal resolution: The principal resolution should be annual, although some processes (e.g., multivoltinism in bark beetles) require higher resolution
- Access to vegetation state: the model needs to collect data on the state of the current vegetation on individual cells. This information include species, number of trees, tree dimensions, available biomass for target pools (foliage, stem, roots), and information about the regeneration layer
- Modification of trees: the model needs to affect trees in the ecosystem models (impact of biotic disturbances) by either removing biomass from target biomass pools (e.g. defoliation) or by killing trees. For biomass removals (foliage, roots) a biological response of the affected trees (e.g., reduced tree growth) need to be designed and implemented
- Outputs: the new model needs to provide grid-based and aggregated outputs for all agent processes

- JavaScript API or equivalent solution: The software should provide an API (or equivalent solution) that is used for the script-based definition of the agent behaviour. The model should provide the basic functions (e.g., for data retrieval and the impact on trees) and should allow further customization. For example, the user should be able to implement alternative types of agent impact, or to change agent specific distribution kernels on the level of JavaScript or equivalent solution.

Source code and detailed technical documentation of the program and its interface, and description of the scientific foundations of the implementation (e.g. parameters for individual biotic agents, source literature, etc.) will be supplied.

Required methodology:
As described above, the implementation should be C++/Qt and should provide a scripting API for increased flexibility in various scientific applications. The simulated data will be stored in a database.