

rePLANT

## II JORNADAS TÉCNICAS

Um ano e meio a inovar  
na floresta

26 de maio 2022  
09h - 13h30  
Museu do Oriente



Cofinanciado por:

Lisb@20<sup>20</sup>

COMPETE  
2020

PORTUGAL  
2020



UNIÃO EUROPEIA  
Fundo Europeu  
de Desenvolvimento Regional

rePLANT

# Partilha de informação entre máquinas e o sistema de apoio à decisão forSCOPE



Cofinanciado por:



Implantação de estratégias colaborativas para a gestão integrada da floresta e do fogo

# rePL<sup>NT</sup> Agenda:

- Recolha e processamento dos dados (Harvester e forwarder)
- Criação e partilha dos ficheiros (StanforD 2010)
- Utilização dos dados no apoio à decisão

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# Objectivo

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## - 1



**Pinho**



Comprimento (cm) **270** (0)

Diâmetro (cm) **549**



### 1



Compr	DiaUB	PM	VolCorte	
251	140	Papel	384	9
250	114	Papel	255	0
250	95	Papel	177	0















Custódio

0

Parreira

24320,78

10:27:19

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# Instalação

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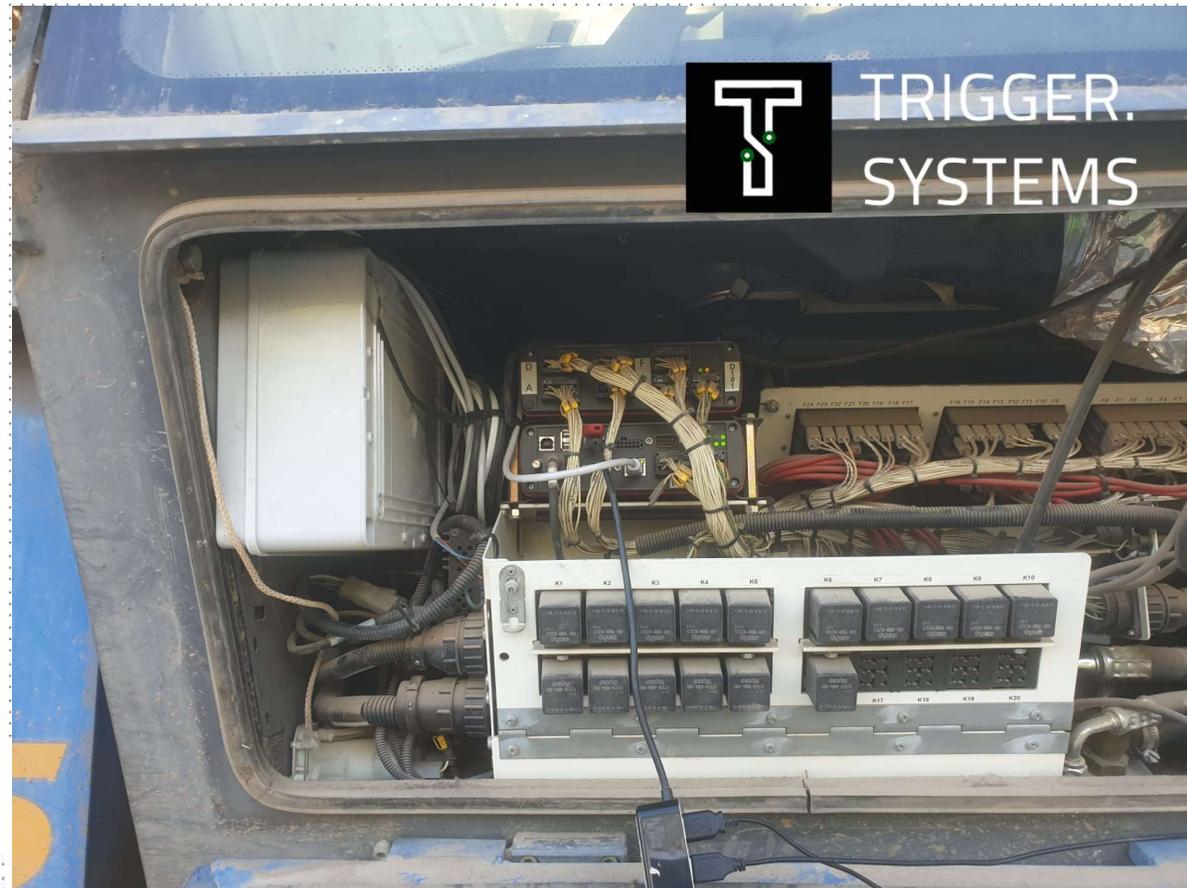
## Equipamentos para a recolha de dados (Harvester e Forwarder)



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# Equipamentos para a recolha de dados (Harvester e Forwarder)



# Equipamentos para a recolha de dados (Harvester e Forwarder)



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# Resultados

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299	LOGVOL	2	Integer	0.0001 m3sub	2	Solid volume of logs under bark: 1...var290_t1
		3	Integer	0.0001 m3sob	2	Solid volume of logs on bark, measured by harvester: 1...var290_t1
300 *	FORCEDCUT	1	integer	Integer	2	Automatic/Operator selected cross cut: 1...var290_t1 0 = Automatic bucking 1 = Operator selected due to decay 2 = " " damage 3 = " " crook 4 = " " sweep 5 = " " grade break 6 = " " pulpwood grade 7 = " " top break 9 = " " miscellaneous If the log is bucked outside the normal "cutting window" (Swedish "kapfonster") 50 should be added to the code. If the quality change after the bucking 100 should be added. If the log is unclassified 200 may be added to the code.  10 = Automatic, spinning Indicates that harvester head cannot feed any further (feed rollers spinning) and last log is cut.
303	TOPLNGTH	1	integer	cm	3	Length of top
		2	integer	cm	2	Estimated length of top
304	NUMMARKS	1	integer	no	3	Number of marks
305	MARKING	1	integer	cm or integer	3	(Start, end, code) 1...var304_t1 Start = Start position measured from butt end End = End position Code 1 = Decay Code 2 = Damage Code 3 = Crook Code 4 = Sweep
306	LOGID	1	string	Text	3	Log ID, e.g. position in stem, Log No., etc.: 1...var290_t1
		2	integer	integer	3	Unique log number for randomly sampled stems used for identifying control logs. Should be 0 (or excluded) if not sampled for control. To be used even if stem is not used for control measuring (rejected according to var38) :1...var290_t1
340	STARTTIM	1	string	hhmmss	3	Start time for processing of a stem
341	ENDTIM	1	string	hhmmss	3	End time for processing of a stem

112	NUMBARKPAR	2	integer	no	2	Number of diameter breaks/tree species: 1...var111_t1. The variable is used together with variable 113, type 2 and type 3. (based on German requirements)
113	BARKPAR	1	integer	0.01 mm 0.1% %	2	Bark parameters/tree species (first parameter in 100ths of mm; second in 10ths per mille): 1...var112_t1/1...var111_t1
		2	integer	mm	2	Lower diameter limits/tree species: 2...var112_t2/1...var111_t1 (based on German requirements)
		3	integer	0.01 mm	2	Deduction for double bark thickness/tree species: 1...var112_t2/1...var111_t1 (based on German requirements)
		4	long integer	0.00001 degrees	2	Latitude used in bark function
*		7	integer	code	2	Type of bark function per species: 1...var111_t1 1= Function according to var113_t1 2= Function according to var113_t2 & var113_t3 3=Skogforsk 2004, Scots pine 4=Skogforsk 2004, Norway spruce
116	NUMASST	1	integer	no	2	Number of price matrices/tree species: 1...var111_t1
120	TREESPEC	2	string	Text	3	Name of tree species
121 *	ASSTDESCR	4	string	yyyymmddhhmmss	3	Time and date when the ap1-file of the assortment was last saved in the software system of the forest company/ price matrix/tree species: 1...var116_t1/1...var111_t1
		5	string	text	3	Additional assortment identification information / price matrix/tree species: 1...var116_t1/1...var111_t1. User-specified codes.
		6	integer	integer	1	Unique identification information set automatically in bucking or forwarder computer / price matrix/tree species (compare with var441_t12): 1...var116_t1/1...var111_t1. Must be a unique identity / key for a price matrix, never repeated in the same harvester or forwarder file (pri/prd/stm/vpt/prl). Not to be changed by operator.

+20.000 Linhas de informação

Separados em 520 ficheiros/dia





200	OPTNLTXT	2	long string	text	3	Optional free text for sending information to the machine. No changes are allowed in the machine. Maximum 300 characters allowed.
		3	long string	text	3	Optional text for sending information from the machine. Maximum 300 characters allowed.
211	OPERATOR	1	integer	ld no	2	Operator name/id, repeated for each stem in ktr- and stm-files
270	STEMNUM	1	integer	1..9999	2	Number of the stem
		2	integer	integer	2	Unique number of randomly sampled stem, used for identifying control stems. Should be 0 (or excluded) if not sampled for control. Possible for operator to reset/set. To be used even if stem is not used for control measuring (rejected according to var38)
		3	integer	integer	1	Unique stem identity to be used for all types of stems (independently of whether it is a randomly selected stem or not) in both ktr- and stm-files. Not to be modified by operator. Incremented with each harvested stem. Reset when starting at harvesting object.
290	NUMLOGS	1	integer	pieces	2	Number of logs (sawlogs and pulpwood). All logs registered in the current file are to be included.
291	TOPDIAOB	3	integer	mm (o.b.)	2	Top diameter of logs on bark (measured manually by operator, M2): 1...var290_t1
		5	integer	mm (o.b.)	2	Top diameter of logs on bark (measured by machine, M1): 1...var290_t1
		6	integer	mm (o.b.)	2	Top diameter of logs on bark (measured by auditor, M3): 1...var290_t1
		7	integer	mm (o.b.)	2	Manually measured top diameters of logs over bark, first unfiltered diameter value from cross measurement (measured manually by operator, M2): 1...var290_t1
		8	integer	mm (o.b.)	2	Manually measured top diameters of logs over bark, second unfiltered diameter value from cross measurement (measured manually by operator, M2): 1...var290_t1
		9	integer	mm (o.b.)	2	Manually measured top diameters of logs over bark, first unfiltered diameter value from cross measurement (measured by auditor, M3): 1...var290_t1

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Arquivo Editar Visualizar Ferramentas Adicionar Ajuda

Pesquisar

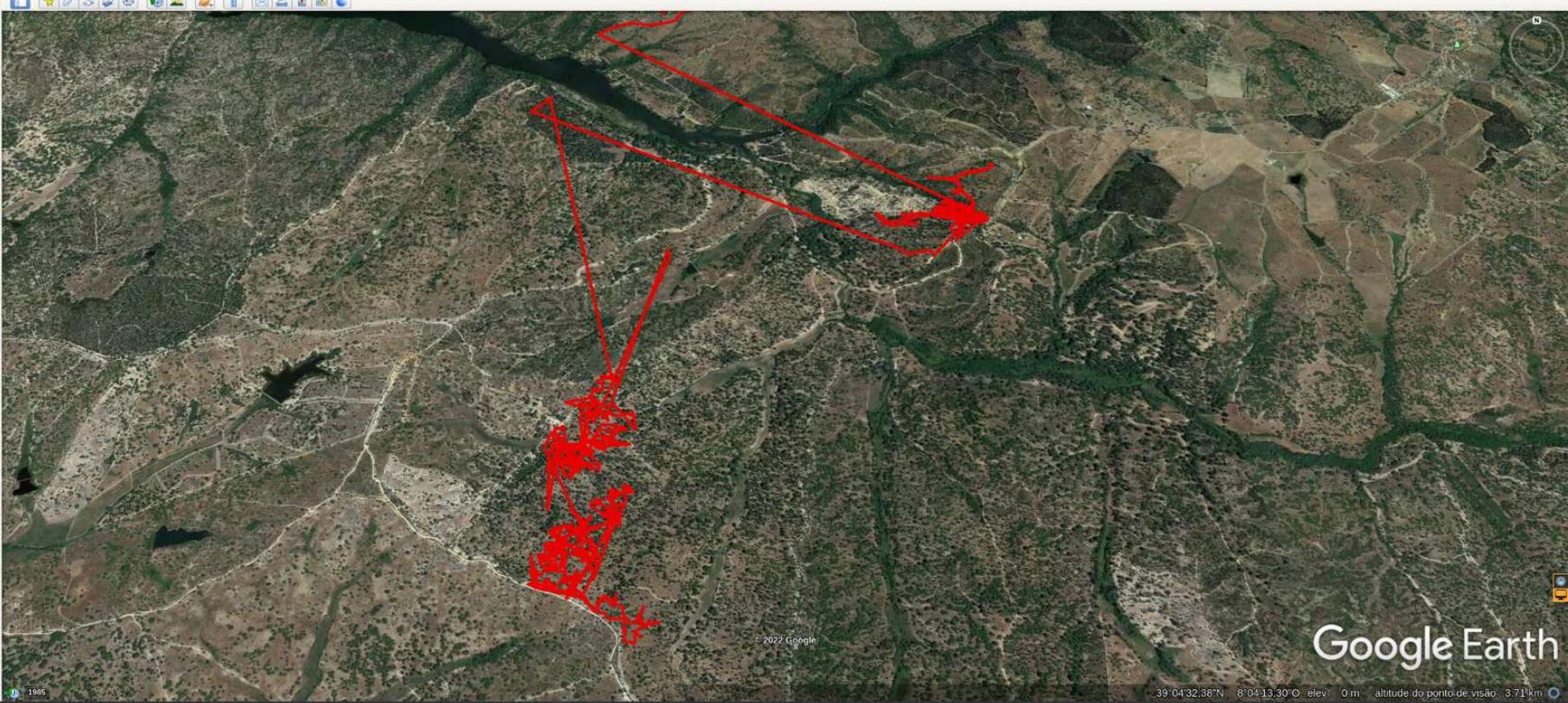
por exemplo: "38.88152 -8.215613" [Obter rotas](#) [Histórico](#)

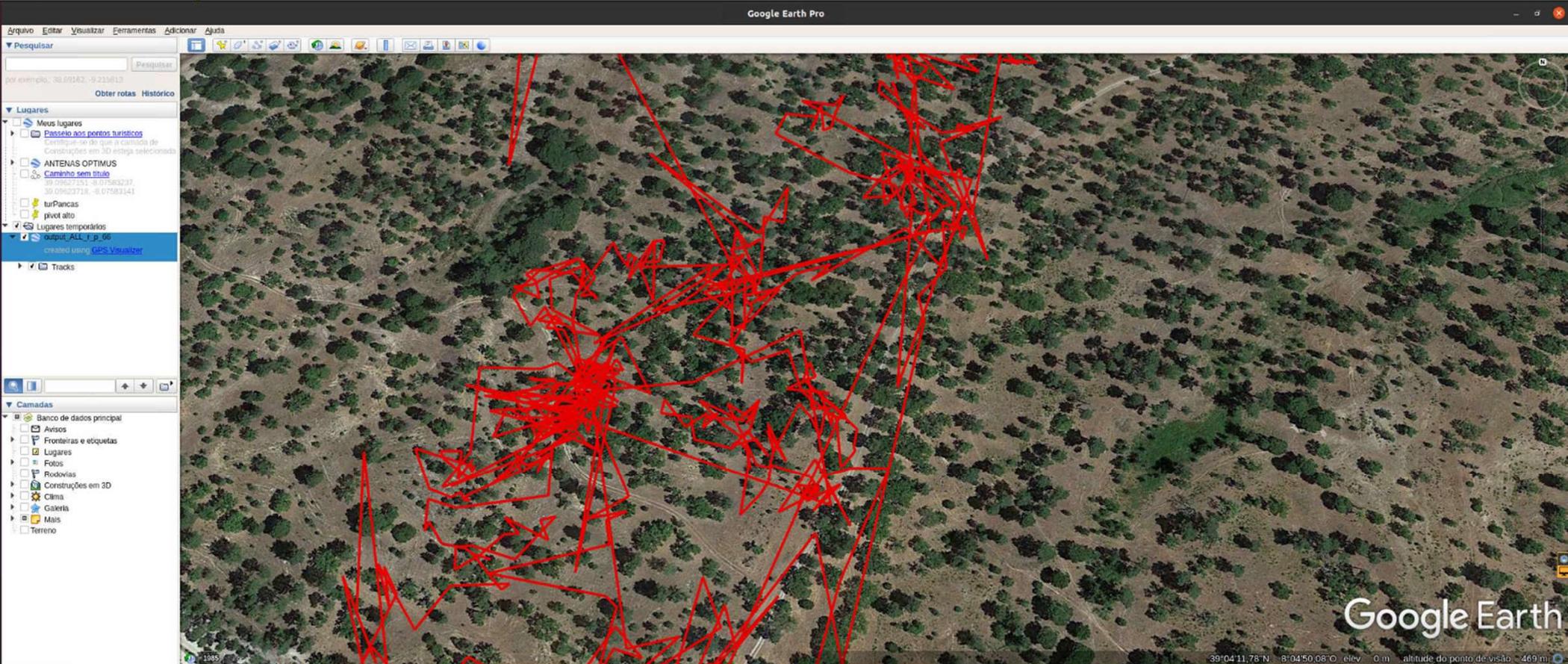
Lugares

- Meus lugares
  - [Passelo aos pontos turísticos](#)  
Comparar de 0 a 40 a camada de Construções em 3D selecionada
  - [ANTENAS OPTIMUS](#)  
[Caminho sem título](#)  
39.05627251 -8.075903237  
39.09628718 -8.07589141
  - [tarPancas](#)  
pivot alto
  - [Lugares temporários](#)  
[osupid\\_ALL\\_f\\_p\\_04](#)  
criados usando [GEG Visualizer](#)
- Tracks

Camadas

- Banco de dados principal
- Avisos
- Fronteiras e etiquetas
- Lugares
- Fotos
- Rodovias
- Construções em 3D
- Carta
- Galeria
- Mais
- Terreno

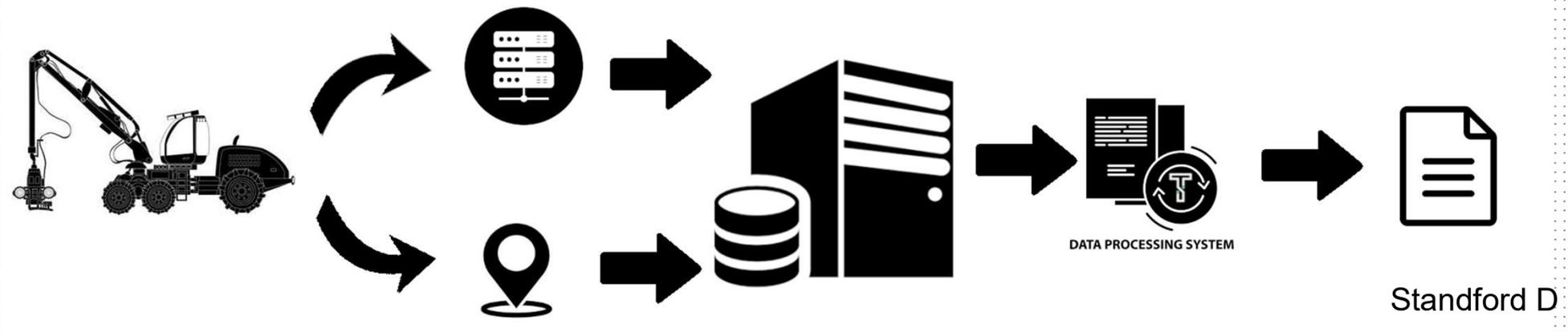




# Processamento da informação

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# rePLANT Recolha e processamento dos dados (Harvester e Forwarder)



# rePLANT Criação e partilha dos ficheiros (Stanford 2010)



<https://www.skogforsk.se/english/projects/stanford/stanford-2010/>

# rePLANT Criação e partilha dos ficheiros (Stanford 2010)

```
1 <?xml version="1.1" encoding="UTF-8"?>
2 <ForwardedProduction>
3   <MachineType>
4     <MachineUserId>56222</MachineUserId>
5   </MachineType>
6   <MessageHeaderType>
7     <CreationDate>20220201182057</CreationDate>
8     <FuelConsumption>1234</FuelConsumption>
9     <CoordinatesType ReceiverPositionType="Base machine position" CoordinateReferenceSystemType="WGS84">
10      <Latitude LatitudeCategoryType="North">39.22623825</Latitude>
11      <Longitude LongitudeCategoryType="West">-8.30824947</Longitude>
12    </CoordinatesType>
13  </MessageHeaderType>>
14  <ForwardedProductionType>
15    <MachineForwardedProductionType>
16      <LoadType>
17        <PartialLoadType>
18          <LoadNumberOfItems LoadNumberCategoryType="Estimated number of logs">18071601,18071602,18071603,18071604,18071605</LoadNumberOfItems>
19          <LoadVolume LoadVolumeCategoryType ="m3sub">959</LoadVolume>
20          <LoadVolume LoadVolumeCategoryType =" Solid volume including bark">959</LoadVolume>
21        </PartialLoadType>
22      </LoadType>
23    </MachineForwardedProductionType>
24  </ForwardedProductionType>
25 </ForwardedProduction>
```

Financiado por:

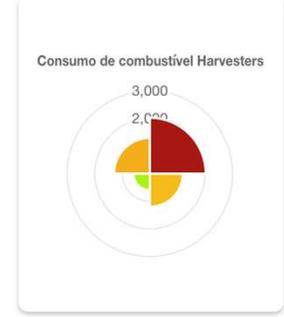
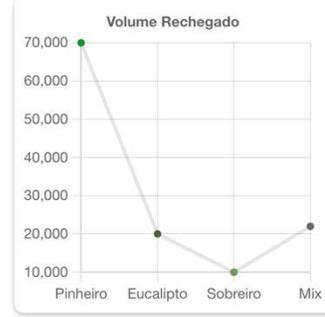
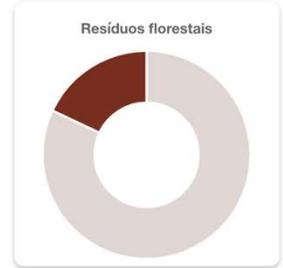
# rePLANT Criação e partilha dos ficheiros (StanforD 2010)

```
1 <?xml version="1.0" encoding="UTF-8"?>
2 <HarvesterProduction>
3   <MachineType>
4     <MachineOwnerId>56222</MachineOwnerId >
5     <MachineUserId>56222</MachineUserId>
6     <MachineBaseModel>Rottne H-11</MachineBaseModel>
7   </MachineType>
8   <MessageHeaderType>
9     <ApplicationVersionCreated>d5Bucking 1.2.0 - Rottne Industri AB</ApplicationVersionCreated>
10    <CreationDate>20220125112655</CreationDate>
11    <ModificationDate>20220125132655</ModificationDate>
12    <FuelConsumption>1234</FuelConsumption>
13  </MessageHeaderType>
14  <HarvestedProductionType>
15    <MachineHarvestedProductionType>
16      <StemHarvestedProductionType>
17        <MultiTreeProcessedStemType>
18          <StemNumber>180716</StemNumber>
19          <StemTreeSpecies>Eucalipto</StemTreeSpecies>
20          <StemCoordinates>
21            <CoordinatesType ReceiverPositionType="Base machine position" CoordinateReferenceSystemType="WGS84">
22              <Latitude LatitudeCategoryType="North">39.22623825</Latitude>
23              <Longitude LongitudeCategoryType="West">-8.30824947</Longitude>
24            </CoordinatesType>
25          </StemCoordinates>
26          <ReferenceDiameter>
27            <LogHarvestedProductionType>
28              <LogType>
29                <LogKey>1</LogKey>
30                <LogVolume logMeasurementCategory="Machine" logVolumeCategory = "m3(price)">316</LogVolume>
31                <LogVolume logMeasurementCategory="Machine" logVolumeCategory = "m3sob">342</LogVolume>
32                <LogVolume logMeasurementCategory="Machine" logVolumeCategory = "m3sub">442</LogVolume>
33                <LogMeasurementType>
34                  <LogDiameter logMeasurementCategory="Machine" logDiameterCategory="Top ob">120</LogDiameter>
```

# rePLANT Utilização dos dados no apoio à decisão

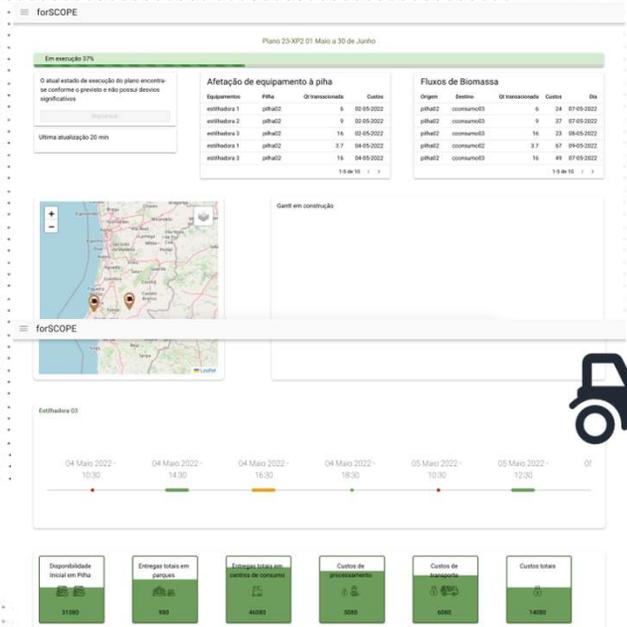
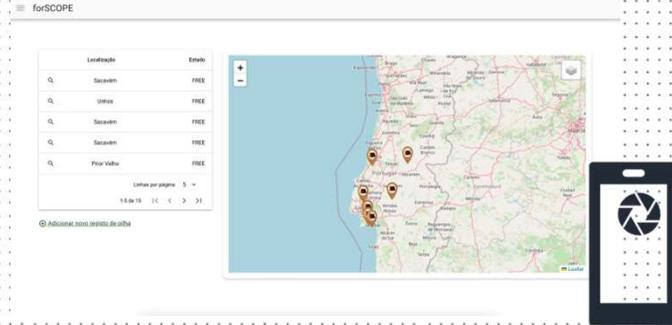
forSCOPE

Visualização dos dados recolhidos no terreno num *dashboard* customizado



# rePLANT Utilização dos dados no apoio à decisão

Visualização agregada dos pontos de interesse (recolhidos ou inseridos)



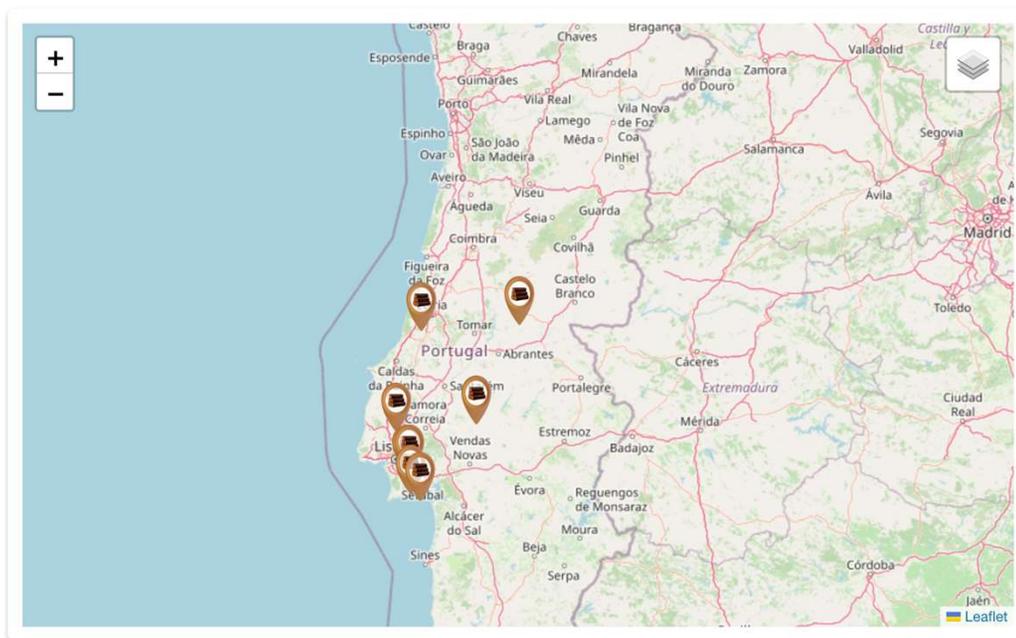
# rePLANT Utilização dos dados no apoio à decisão

forSCOPE

Visualização dos pontos de interesse, possibilidade de novas introduções

	Estado
Q	Sacavém
Q	Prior Velho
Linhas por página: 5	
1-5 de 15	

[+ Adicionar novo registo de pilha](#)



Plano 23-XP2 01 Maio a 30 de Junho

## Visualização dos planos

Replanear

Ultima atualização 20 min

### Afetação de equipamento à pilha

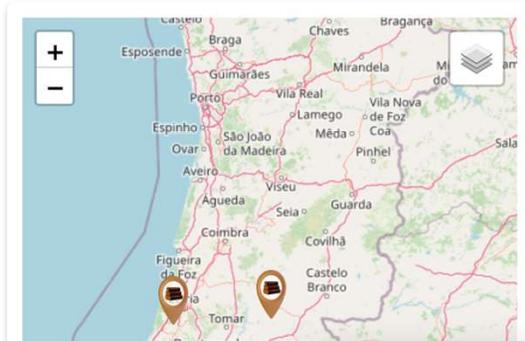
Equipamentos	Pilha	Qt transacionada	Custos
estilhadora 1	pilha02	6	02-05-2022
estilhadora 2	pilha02	9	02-05-2022
estilhadora 3	pilha02	16	02-05-2022
estilhadora 1	pilha02	3.7	04-05-2022
estilhadora 3	pilha02	16	04-05-2022

1-5 de 10 < >

### Fluxos de Biomassa

Origem	Destino	Qt transacionada	Custos	Dia
pilha02	cconsumo03	6	24	07-05-2022
pilha02	cconsumo03	9	37	07-05-2022
pilha02	cconsumo03	16	23	08-05-2022
pilha02	cconsumo02	3.7	67	09-05-2022
pilha02	cconsumo03	16	49	07-05-2022

1-5 de 10 < >



Gantt em construção



# rePLANT Utilização dos dados no apoio à decisão

forSCOPE



Visualização das estatísticas dos planos em tempo real

04 Maio 2022 -  
10:30

04 Maio 2022 -  
14:30

04 Maio 2022 -  
16:30

04 Maio 2022 -  
18:30

05 Maio 2022 -  
10:30

05 Maio 2022 -  
12:30

05

Disponibilidade  
Inicial em Pilha



31080

Entregas totais em  
parques



980

Entregas totais em  
centros de consumo



46080

Custos de  
processamento



5080

Custos de  
transporte



6080

Custos totais



14080

Financiado por:

# rePLANT Próximos passos



Rastreabilidade dos dados identificados com os dados recolhidos

 7 de Junho (INESCTEC, TRIGGER, FORESTWISE, NAVIGATOR)

Validação da estrutura dos ficheiros stanForD 2010

 21 de Junho (INESCTEC, TRIGGER, FORESTWISE, NAVIGATOR)

Validação dos indicadores graficamente

 a definir (INESC TEC, NAVIGATOR, Florecha, Altri Florestal)

Financiado por:

# rePLANT Recolha e processamento dos dados (Harvester e Forwarder)





Implantação de estratégias colaborativas  
para a gestão integrada da floresta e do fogo

Obrigado.

Cofinanciado por:



UNIÃO EUROPEIA  
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