

Soil-air interface.

Using the functionality of COMETS, one can design simulations which go beyond in silico corollaries of lab experiments to make predictions for environments mimicking natural ecosystems, which is a necessary step for understanding natural ecology from first principles. In this example, we consider a simulation of a soil environment. We use source-and-sink functions to model how a root provides organic acids to the environment while removing ammonia (Huang et al 2014 Botany). While we restrict the root functionality to a source/sink, one could use functionality demonstrated above, for example extracellular enzymes, to generate feedback loops between microbe-produced metabolites and root exudation. We use fixed metabolite concentrations to mimic the largely unchanging air interface above a root, which generates an oxygen gradient. Additionally, since soil is characterized by strong spatial structure with many impenetrable barriers that localized interactions (Nunan 2017), we place "rock" barriers throughout the simulation area. A more complex simulation could use varying diffusion constants for metabolites, as described in a previous protocol (Virtual Petri Dish). Similarly, we use standard diffusion of biomass, but this could be changed to use pushing force or non-linear diffusion for a potentially increased realism.

```
In [1]: import cobra
import cobra.test # for the ijo1366 model
import sys
import copy
import numpy as np
sys.path.append("/home/jeremy/Dropbox/work_related/harcombe_lab/segre/cometspy")
import cometspy as c
```

Para nuestro proyecto, utilizaremos *Escherichia coli* (modelo iAF1260), *Pseudomonas putida* (modelo iJN1463) y *Saccharomyces Cerevisiae* (modelo iMM904), recuperados de la base de datos BIGG.

Cambiamos los bounds de las funciones objetivo de los modelos:

```
In [2]: model_dir = "./modelos" # model location
iAF = cobra.io.read_sbml_model(model_dir + '/iAF1260.xml')
iAF.reactions.get_by_id('BIOMASS_Ec_iAF1260_core_59p81M').lower_bound = 0
iAF.reactions.get_by_id('BIOMASS_Ec_iAF1260_core_59p81M').upper_bound = 1000

iJN = cobra.io.read_sbml_model(model_dir + '/iJN1463.xml')
iJN.reactions.get_by_id('BIOMASS_KT2440_WT3').lower_bound = 0
iJN.reactions.get_by_id('BIOMASS_KT2440_WT3').upper_bound = 1000

iMM = cobra.io.read_sbml_model(model_dir + '/iMM904.xml')
iMM.reactions.get_by_id('BIOMASS_SC5_notrace').lower_bound = 0
iMM.reactions.get_by_id('BIOMASS_SC5_notrace').upper_bound = 1000
```

Luego se convierten estos modelos al formato de COMETS. Se utilizan funciones helper para dos cosas: a) Asegurar que el modelo en COMETS no confunda las reacciones de "sink" con las de exchange, ya que en COBRA están desbalanceadas y por tanto se parecen a las de exchange, y b) abrir todos los bounds de las reacciones de exchange, para que COMETS controle la composición del medio.

```
In [3]: iAF_comets = c.model(iAF)
iAF_comets.ensure_sinks_are_not_exchanges()
iAF_comets.open_exchanges()

iJN_comets = c.model(iJN)
iJN_comets.ensure_sinks_are_not_exchanges()
iJN_comets.open_exchanges()

iMM_comets = c.model(iMM)
iMM_comets.ensure_sinks_are_not_exchanges()
iMM_comets.open_exchanges()
```

El mundo que se simulará tendrá dimensiones de 30x30. El eje de la izquierda ($x = 0$) corresponde a la raíz, y el eje superior ($y = 0$) corresponde al aire. La biomasa y las rocas se distribuyen en el resto del grid. Donde hayan rocas no puede haber ni biomasa ni metabolitos, así que seleccionamos esos lugares primero. Para esta simulación, se generarán 50 rocas con un tamaño medio de 5 cuadraditos. Para generar las piedras se utiliza la función helper `grow_rocks`.

```
In [4]: from cometspy.utils import grow_rocks, pick_random_locations

grid_size = 30 # 100
n_rocks = 50 # 70
rock_locs = grow_rocks(n = n_rocks, xrange = [1,grid_size-1],yrange = [1,grid_size-1],mean_size = 5)
```

Cada especie será plantada en 20 lugares sin superponerse. Para esto se utiliza la función helper `pick_random_locations`, la cual toma como argumento una tupla generada anteriormente que marca lugares "prohibidos", como los cuadrados donde se encuentran las rocas.

Generamos una copia de `rock_locs` para no cambiarla accidentalmente, y la llamamos `forbidden_locs`:

```
In [5]: import copy
```

```
import copy
forbidden_locs = copy.deepcopy(rock_locs)
```

Ahora elegimos al azar los lugares para cada especie, y los vamos añadiendo a la lista forbidden_locs para que no se sobrepongan:

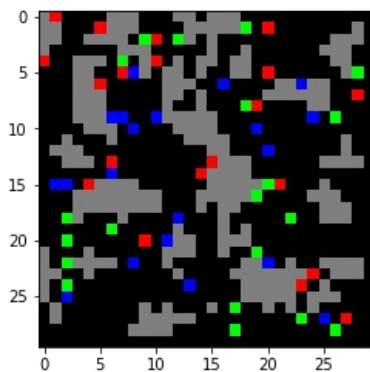
```
In [6]: founders_per_species = 20 # 60
iAF_locs = pick_random_locations(n = founders_per_species,
                                xrange = [1,grid_size], yrange = [1,grid_size],
                                forbidden_locs = forbidden_locs)

forbidden_locs.extend(iAF_locs)
iJN_locs = pick_random_locations(founders_per_species, [1,grid_size],[1,grid_size], forbidden_locs)
forbidden_locs.extend(iJN_locs)
iMM_locs = pick_random_locations(founders_per_species, [1,grid_size],[1,grid_size], forbidden_locs)
forbidden_locs.extend(iMM_locs)
```

Para graficar los lugares utilizamos matplotlib:

```
In [7]: from matplotlib import pyplot as plt
initial_image = np.zeros((grid_size,grid_size,3))
for rock in rock_locs:
    initial_image[rock[1]-1,rock[0]-1,0:3] = 0.5
for loc in iAF_locs:
    initial_image[loc[1]-1,loc[0]-1,0] = 1
for loc in iJN_locs:
    initial_image[loc[1]-1,loc[0]-1,1] = 1
for loc in iMM_locs:
    initial_image[loc[1]-1,loc[0]-1,2] = 1
plt.imshow(initial_image)
```

Out[7]: <matplotlib.image.AxesImage at 0x11cb9061d30>



Generamos el layout y agregamos las rocas:

```
In [8]: layout = c.layout()
layout.grid = [grid_size,grid_size]
layout.add_barriers(rock_locs)
```

building empty layout model
models will need to be added with layout.add_model()

Setteamos las poblaciones iniciales para cada especie, con esto los modelos están listos y los añadimos al layout:

```
In [9]: iAF_comets.initial_pop = [[loc[0],loc[1],1e-8] for loc in iAF_locs]
iJN_comets.initial_pop = [[loc[0],loc[1],1e-8] for loc in iJN_locs]
iMM_comets.initial_pop = [[loc[0],loc[1],1e-8] for loc in iMM_locs]

layout.add_model(iAF_comets)
layout.add_model(iJN_comets)
layout.add_model(iMM_comets)
```

Añadimos los metabolitos que estarán inicialmente disponibles en el ambiente. Usamos la función helper add_typical_trace_metabolites() para las trazas típicas. Bajamos el valor del oxígeno dado que la idea es que el que esté disponible difunda desde la atmósfera. Añadimos algunos metabolitos que no se añadieron con la función helper:

```
In [10]: layout.add_typical_trace_metabolites()
layout.set_specific_metabolite('o2_e',0.00001)
layout.set_specific_metabolite('hco3_e',1000)
```

```

layout.set_specific_metabolite('co2_e',1000)
layout.set_specific_metabolite('h2_e',1000)
layout.set_specific_metabolite('so3_e',1000)
layout.set_specific_metabolite('nh4_e',0.000001)

layout.set_specific_metabolite('glc_D_e',0.0000001)
layout.set_specific_metabolite('meoh_e',0.00000001)
layout.set_specific_metabolite('cys_L_e',0.0000001)
layout.set_specific_metabolite('4abz_e',0.0000001)
layout.set_specific_metabolite('nac_e',0.0000001)

```

Para la capa de aire, dejamos el oxígeno en un valor constante. Al fondo también dejamos al oxígeno en un valor fijo e igual a 0, para simular el efecto de difusión. De manera similar, hacemos lo mismo con el amoníaco y la raíz en la parte izquierda:

```

In [11]: # set static media of O2 and CO2 at the top and bottom-- the "air" and continuous loss of O2 downwards
for x in range(grid_size):
    layout.set_specific_static_at_location('o2_e', (x,0), .0001) # top
    layout.set_specific_static_at_location('o2_e', (x,grid_size-1), 0.) # bottom
    layout.set_specific_static_at_location('co2_e', (x,0), .0001)

for x in range(grid_size):
    layout.set_specific_static_at_location('nh4_e', (0,x), 0.0)

```

La raíz consume todo el amoníaco, pero es una fuente de ácidos orgánicos y metanol para el ambiente. Asumiendo una tasa fija:

```

In [12]: for x in range(grid_size):
    layout.set_specific_refresh_at_location('cit_e', (0,x), .000001)
    layout.set_specific_refresh_at_location('meoh_e', (0,x), .000001)
    layout.set_specific_refresh_at_location('succ_e', (0,x), .000001)

```

El layout y los modelos están listos, ahora seteamos los parámetros de la simulación:

```

In [13]: params = c.params()
params.set_param('timeStep', 0.1)
params.set_param('maxCycles', 1000)
params.set_param('maxSpaceBiomass', 10)
params.set_param('deathRate', 0.0001) # die at rate of 1/10000 per hour
params.set_param('writeBiomassLog', True)
params.set_param('BiomassLogRate', 500)
params.set_param('writeMediaLog', True)
params.set_param('MediaLogRate', 500)
params.set_param("writeFluxLog", True)
params.set_param("FluxLogRate", 500)
params.set_param('numRunThreads', 3)
params.set_param('defaultKm', 0.000001)

```

Ahora creamos el objeto de la simulación y la corremos. Ojito que se demora y el pc empieza a despegar.

```

In [14]: sim = c.comets(layout, params)
sim.set_classpath("concurrent", "/opt/colt/lib/concurrent.jar")
sim.set_classpath("colt", "/opt/colt/lib/colt.jar")
sim.set_classpath("lang3", "/opt/commons-lang3-3.9/commons-lang3-3.9.jar")
sim.set_classpath("jmatio", "/opt/jmatio/lib/jmatio.jar")
sim.set_classpath("math3", "/opt/commons-math3-3.6.1/commons-math3-3.6.1.jar")
sim.set_classpath("bin", "/home/jeremy/Dropbox/work_related/harcombe_lab/segre/jars/comets_2.10.0.jar")
sim.set_classpath("gurobi", "/opt/gurobi900/linux64/lib/gurobi.jar")
sim.set_classpath("jdistlib", "/opt/jdistlib-0.4.5-bin.jar")
sim.run(False)

```

Running COMETS simulation ...

```

C:\ProgramData\Anaconda3\lib\site-packages\IPython\core\interactiveshell.py:3357: DtypeWarning: Columns (5,6,9,10
,12,18,39,42,43,48,51,58,75,81,82,84,101,110,116,119,121,127,129,139,156,163,164,167,170,171,175,182,185,189,205,
206,220,228,229,239,246,249,251,252,255,256,257,262,266,277,280,284,285,287,291,294,303,312,316,328,343,346,352,3
77,388,390,399,401,404,408,413,415,417,420,421,422,424,430,431,432,434,435,444,450,463,478,499,506,507,511,541,55
1,563,565,566,587,636,643,651,655,659,663,666,668,670,674,676,685,691,696,712,713,722,726,740,741,742,743,750,753
,755,760,761,789,791,796,801,806,809,824,836,847,866,868,885,888,889,890,891,903,904,908,914,917,919,926,933,937,
943,944,947,961,964,969,970,972,973,976,981,983,992,998,999,1002,1004,1005,1015,1016,1021,1023,1025,1031,1032,104
6,1053,1055,1058,1063,1065,1068,1070,1071,1078,1082,1088,1091,1098,1112,1113,1114,1116,1128,1129,1131,1135,1159,1
170,1173,1178,1182,1188,1189,1190,1195,1204,1213,1214,1216,1217,1221,1237,1249,1252,1259,1261,1277,1302,1303,1304
,1307,1315,1316,1317,1332,1333,1334,1347,1349,1358,1363,1364,1365,1389,1401,1404,1412,1421,1432,1433,1442,1451,14
54,1455,1461,1462,1468,1472,1485,1499,1500,1501,1502,1508,1509,1510,1511,1513,1517,1521,1526,1527,1528,1534,1536,
1540,1542,1544,1546,1549,1553,1554,1556,1557,1560,1570,1572,1573,1585,1587,1589,1590,1593,1601,1603,1604,1605,160
6,1607,1624,1625,1626,1627,1634,1638,1641,1645,1646,1663,1665,1670,1676,1678,1683,1689,1690,1691,1692,1701,1702,1
703,1704,1705,1706,1707,1708,1709,1716,1717,1719,1720,1722,1723,1725,1727,1728,1730,1731,1736,1739,1740,1742,1747
,1760,1761,1766,1782,1784,1785,1788,1789,1790,1793,1796,1798,1799,1805,1807,1808,1811,1812,1813,1814,1815,1816,18
18,1820,1826,1827,1836,1845,1854,1855,1856,1862,1863,1864,1868,1874,1875,1876,1878,1881,1883,1889,1898,1899,1902,
1906,1909,1911,1914,1915,1916,1918,1919,1922,1924,1925,1926,1927,1930,1935,1936,1941,1942,1947,1948,1951,1954,196
1,1963,1964,1968,1969,1970,1971,1973,1974,1975,1976,1977,1978,1984,1985,1987,1989,1991,1996,1998,1999,2000,2001,2

```

```
002,2003,2006,2015,2017,2019,2037,2047,2049,2051,2053,2054,2055,2057,2060,2068,2071,2073,2075,2081,2083,2084,2110
,2118,2124,2129,2135,2140,2150,2153,2167,2171,2173,2174,2175,2176,2177,2178,2210,2234,2239,2243,2250,2251,2252,22
54,2256,2257,2261,2262,2264,2265,2266,2274,2285,2289,2293,2303,2318,2319,2356,2357,2371,2374,2387,2388,2389,2390,
2391,2392,2393,2394,2398,2399,2410,2418,2420,2423,2424,2426,2427,2428,2429,2431,2437,2440,2441,2444,2453,2457,245
8,2459,2466,2471,2472,2473,2474,2475,2476,2477,2478,2479,2481,2484,2485,2486,2487,2489,2493,2502,2503,2526,2530,2
532,2533,2535,2546,2574,2575,2588,2592,2593,2594,2595,2598,2600,2601,2602,2613,2621,2624,2626,2627,2628,2629,2631
,2655,2664,2694,2697,2698,2704,2708,2711,2712,2713,2714,2723,2724,2725,2726,2728,2730,2733,2739,2742,2745,2753,27
55,2756,2758,2762,2763,2766,2783,2785,2788,2802,2805,2807,2811,2814,2817,2818,2819,2820,2821,2826,2837,2859,2884,
2911,2912,2913,2915,2916,2917) have mixed types.Specify dtype option on import or set low_memory=False.
if (await self.run_code(code, result, async_=asy)):
```

Done!

```
In [15]: print(sim.run_output)
```

```
-script
running script file: C:\Users\ronal\Desktop\Simulacion_suelo_larga/.current_script_0x11cb91a1070
Current Java version: 17.0.1
Parameters file .current_global_0x11cb91a1070 loaded.
Parameters file .current_package_0x11cb91a1070 loaded.
Loading layout file '.current_layout_0x11cb91a1070'...
null\COMETS_manifest.txt (El sistema no puede encontrar la ruta especificada)
Unable to initialize manifest file.
Continuing without writing manifest file.
Found 3 model files!
Loading '.\iAF1260.cmd' ...
Academic license - for non-commercial use only - expires 2021-12-02
Academic license - for non-commercial use only - expires 2021-12-02
Done!
Testing default parameters...
Done!
Optimizer status code = 5 (looks ok!)
objective solution = 395.7352921962825
Loading '.\iJN1463.cmd' ...
Academic license - for non-commercial use only - expires 2021-12-02
Academic license - for non-commercial use only - expires 2021-12-02
Done!
Testing default parameters...
Done!
Optimizer status code = 5 (looks ok!)
objective solution = 237.06607191111198
Loading '.\iMM904.cmd' ...
Academic license - for non-commercial use only - expires 2021-12-02
Academic license - for non-commercial use only - expires 2021-12-02
Done!
Testing default parameters...
Done!
Optimizer status code = 5 (looks ok!)
objective solution = 133.8587770175764
Constructing world...
Done!
medialist      12dgr160_e      12dgr180_e      12ppd_R_e      12ppd_S_e      13BDgln_e      13damp_e
14glucan_e     15dap_e lag160_e      lag180_e      lag181d9_e      lag182d9d12_e  23camp_e      23ccmp_e
23cgmp_e      23cump_e      23dappa_e      25dkgln_e      26dap_M_e      2ameph_e      2ddgln_e
2dhgln_e      2hb_e  2m35mdntha_e      2mbac_e      2mbald_e      2mbtoh_e      2mppal_e      2phetoh_e
34dhbz_e      34dhcinm_e      34dhpac_e      34dhphe_e      35dnta_e      3amp_e  3c3hmp_e      3cmp_e
3gmp_e  3h4atb_e      3hcinm_e      3hpppn_e      3mb_e  3mbald_e      3mop_e  3oxoadp_e      3ump_e
4abut_e 4abz_e 4hbz_e 4hoxpacd_e      4hpro_DC_e      4hpro_LT_e      4hptn_e 4oxptn_e      5aop_e 5aptn_e 5
dglcn_e 5g2oxpt_e      5mcsn_e 5oxpro_e      6atha_e 6hnac_e 8aonn_e LalaDgluMdapDala_e      LalaDgluMdap_e
LalaLglu_e      Nbfortyr_e      Ncbmpts_e      R3hdec4e_e      R_3h4atba_e      R_3h6atha_e      R_3hcmrs7e_e
R_3hdcaa_e      R_3hdd5ea_e      R_3hdd6e_e      R_3hdda_e      R_3hhdca_e      R_3hhpa_e      R_3hhxa_e
R_3hnonaa_e      R_3hocta_e      R_3hpb_a_e      R_3hpdca_e      R_3hphpa_e      R_3hphxa_e      R_3hpnona_e
R_3hpoc_a_e      R_3hppta_e      R_3hpt_e      R_3htd58e_e      R_3htd5e_e      R_3httdca_e      T4hcinm_e
abt_e ac_e      acac_e acald_e aces_e acgal1p_e      acgal_e acgam1p_e      acgam_e acmana_e
acmtsoxin_e      acum_e acnam_e acolipa_e      acon_C_e      acpptrn_e      acser_e actn_R_e      ade_e
adn_e adocbl_e      ag_e      agm_e agk_e      ala_B_e ala_D_e      ala_L_e      alaala_e      alahis_e
alaleu_e      alathr_e      alatr_p_e      algac_MG_14_e      algac_MG_23_e      algac_MG_32_e      algac_MG_41_e
algac_M_e      all_D_e      alltn_e alltt_e amet_e amp_e anhgm_e apc_e arab_D_e      arab_L_e
arbtn_e arbtn_fe3_e      arg_D_e      arg_L_e      ascb_L_e      asn_D_e      asn_L_e      aso3_e
aso4_e asp_L_e      balaala_e      balabala_e      balagly_e      balaleu_e      balamd_e      bhb_e
biliverd_e      btd_RR_e      btn_e      but_e      butso3_e      bz_e      ca2_e      carn_e      catechol_e      cbi_e
cbl1_e cd2_e      cell4_e cgly_e      chol_e chols_e      chor_e      cinm_e      cit_e      cl_e      cm_e      cmbtt_e      cmp_e
co2_e co_e      cobalt2_e      colipa_e      confrl_e      cpgn_e      cpgn_un_e      creat_e crn_e      cro2_e
cro4_e crtn_e      csn_e cu2_e      cu_e      cyan_e      cynt_e      cys_D_e      cys_L_e      cytd_e      d2one_e      d3one_e      d
4one_e dad_2_e      dag181d9_e      dag182d9d12_e      damp_e      dann_e      dca_e      dcmp_e      dcyt_e      ddca_e      dgmp_e      dgsn_e
dgudbutn_e      dha_e      dimp_e      din_e      dmanur_e      dmgly_e      dms_e      dms02_e      dms0_e      dopa_e      dtmp_e      dttp_e
dump_e      duri_e      eca4colipa_e      ecto_L_e      enlipa_e      enter_e      epist_e      epistest_SC_e      ergst_e      ergstest_
SC_e      etha_e      ethso3_e      etoh_e      f6p_e      fald_e      fcmcbtt_e      fe2_e      fe3_e      fe3dcit_e
fe3dhbzs_e      fe3hox_e      fe3hox_un_e      fe3mcbtt_e      fe3pyovd_e      fe3pyovd_kt_e      fecost_e
```

fecostest_SC_e	fecrm_e	fecrm_un_e	feenter_e	feoxam_e	feoxam_un_e	fer_e	fmn_e	for_e					
fru_e	frulys_e	fruur_e	fuc_L_e	fum_e	glp_e	g3pc_e	g3pe_e	g3pg_e	g3pi_e	g3ps_e	g6p_e		
ga_e	gallp_e	gal_bD_e	gal_e	galct_D_e	galctn_D_e	galctn_L_e	galt_e	galur_e	gam6p_e	g			
am_e	gbbtn_e	gcald_e	gdp_e	glc_D_e	glcn_e	glcr_e	glcur1p_e	glcur_e	gln_L_e	glu_L_e			
glutar_e	glx_e	gly_e	glyald_e	glyb_e	glyc2p_e	glyc3p_e	glyc_R_e	glyc_e					
glyclt_e	glycol_e	glygln_e	glyglu_e	glygly_e	glymet_e	glyphe_e							
glyser_e	gmp_e	gsn_e	gthox_e	gthrd_e	gtp_e	gua_e	gudac_e	gudptn_e	h2_e	h2o2_e	h2o_e		
h2s_e	h_e	hacolipa_e	halipa_e	hco3_e	hcys_L_e	hdca_e	hdcea_e	hexc_e	hg2_e	hgntis_e			
his_L_e		higly_e	hishis_e	hom_L_e	hpta_e	hxa_e	hxa_n_e	iamac_e	iamoh_e	ibutac_e			
ibutoh_e		icit_e	id3acald_e	idon_L_e	ile_L_e	imp_e	ind3ac_e	ind3eth_e					
indole_e		inost_e	ins_e	isetac_e	k_e	kdo2lipid4_e	lac_D_e	lac_L_e	lanost_e				
lanostest_SC_e		lcts_e	leu_D_e	leu_L_e	leuleu_e	lipa_cold_e	lipa_e	lnlc_e	lpspput_e				
lys_D_e		lys_L_e	lyx_L_e	m_xyl_e	mal_D_e	mal_L_e	malt_e	malthx_e					
maltpt_e		malttr_e	malttttr_e	man6p_e	man_e	manglyc_e	manur_e	mcbbt_e	melib_e	meoh_e			
met_D_e		met_L_e	metsox_R_L_e	metsox_S_L_e	mg2_e	minohp_e	mmet_e	mn2_e	mnL_e				
mobd_e	mso3_e	mtsoxin_e	n2o_e	n2one_e	nal_e	nac_e	nadp_e	nh4_e	ni2_e	nmn_e	no2_e	no3_e	
no_e	nona_e	ol6a4colipa_e	o2_e	o2s_e	o_xyl_e	oaa_e	ocdca_e	ocdcea_e	ocdcya_e	octa_e			
orn_D_e		orn_e	orot_e	oxa_e	p_xyl_e	pac_e	pacald_e	pap_e	pb2_e	pc_SC_e	pea_e	peamn_e	p
ectin_e	pentso3_e	pepd_e	phe_D_e	phe_L_e	pheac_e	phedca_e	phehpa_e	phehpa_e					
pheme_e	phenona_e	pheocta_e	phept_e	phpyr_e	pi_e	pnto_R_e	ppa_e	ppal_e	ppi_e	pppn_e			
ppt_e	pptrn_e	prealg_MG_14_e	prealg_MG_23_e	prealg_MG_32_e	prealg_MG_41_e	prealginate_6_e	pro_D_e						
pro_L_e		progly_e	psclys_e	pser_L_e	pta_e	ptdlino_SC_e	ptrc_e	ptsla_e	pydam_e	p			
yovd_e	pyovd_kt_e	pyr_e	quin_e	r5p_e	rib_D_e	ribflv_e	rmn_e	sbo3_e	sbt_D_e				
sbt_L_e		sel_e	ser_D_e	ser_L_e	sheme_e	skm_e	so2_e	so3_e	so4_e	spmd_e	sprm_e		
srb_L_e		succ_e	sucr_e	sulfac_e	tag160_e	tag180_e	tag181d9_e	tag182d9d12_e					
tartr_L_e		taur_e	tcynt_e	thm_e	thmp_e	thmpp_e	thr_L_e	thrp_e	thym_e	thymd_e	tma_e	tmanur_e	
tmao_e	tnt_e	tol_e	tre_e	trp_L_e	tsul_e	ttca_e	ttcea_e	ttcyc_e	tungs_e	tym_e			
tyr_D_e		tyr_L_e	tyrp_e	uacgam_e	udpacgal_e	udpg_e	udpgal_e	udpglcur_e					
ump_e	und2one_e	ura_e	urea_e	uri_e	vacc_e	val_D_e	val_L_e	vanln_e	vanlt_e	xan_e			
xmp_e	xtsn_e	xyl_D_e	xylt_e	xylu_L_e	zn2_e	zymst_e	zymstest_SC_e						

Cycle 1

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FBARunThread-0 starting up.

FBARunThread-2 starting up.

FBARunThread-1 starting up.

Total biomass:

Model iAF1260.cmd: 2.4178779938874546E-7

Model iJN1463.cmd: 2.1732574380413832E-7

Model iMM904.cmd: 2.1552923309573375E-7

Cycle 2

Total biomass:

Model iAF1260.cmd: 2.924217071913039E-7

Model iJN1463.cmd: 2.3720360214201023E-7

Model iMM904.cmd: 2.324624677802688E-7

Cycle 3

Total biomass:

Model iAF1260.cmd: 3.550165913624941E-7

Model iJN1463.cmd: 2.594921242254128E-7

Model iMM904.cmd: 2.51233138817468E-7

Cycle 4

Total biomass:

Model iAF1260.cmd: 4.316302874815228E-7

Model iJN1463.cmd: 2.8418036552362417E-7

Model iMM904.cmd: 2.718950219934192E-7

Cycle 5

Total biomass:

Model iAF1260.cmd: 5.252895791686232E-7

Model iJN1463.cmd: 3.114466494073613E-7

Model iMM904.cmd: 2.945903002974666E-7

Cycle 6

Total biomass:

Model iAF1260.cmd: 6.397732375681056E-7

Model iJN1463.cmd: 3.415565796006225E-7

Model iMM904.cmd: 3.194517933081955E-7

Cycle 7

Total biomass:

Model iAF1260.cmd: 7.796478558655336E-7
Model iJN1463.cmd: 3.7477865359864356E-7
Model IMM904.cmd: 3.4666532713152633E-7
Cycle 8
Total biomass:
Model iAF1260.cmd: 9.504972486585876E-7
Model iJN1463.cmd: 4.1142606969562364E-7
Model IMM904.cmd: 3.764204725922019E-7
Cycle 9
Total biomass:
Model iAF1260.cmd: 1.159115693466456E-6
Model iJN1463.cmd: 4.5185014842215293E-7
Model IMM904.cmd: 4.089332863816762E-7
Cycle 10
Total biomass:
Model iAF1260.cmd: 1.4137046629391021E-6
Model iJN1463.cmd: 4.964341142202401E-7
Model IMM904.cmd: 4.4443370053700745E-7
Cycle 11
Total biomass:
Model iAF1260.cmd: 1.7242174121024497E-6
Model iJN1463.cmd: 5.455958574215394E-7
Model IMM904.cmd: 4.83168844872873E-7
Cycle 12
Total biomass:
Model iAF1260.cmd: 2.0976537851943655E-6
Model iJN1463.cmd: 5.998087861967491E-7
Model IMM904.cmd: 5.254065280061383E-7
Cycle 13
Total biomass:
Model iAF1260.cmd: 2.540799182432554E-6
Model iJN1463.cmd: 6.595857694391594E-7
Model IMM904.cmd: 5.714397277152346E-7
Cycle 14
Total biomass:
Model iAF1260.cmd: 3.065744220653504E-6
Model iJN1463.cmd: 7.25487366858392E-7
Model IMM904.cmd: 6.215855811556782E-7
Cycle 15
Total biomass:
Model iAF1260.cmd: 3.687944934463662E-6
Model iJN1463.cmd: 7.981264616117128E-7
Model IMM904.cmd: 6.761840656695651E-7
Cycle 16
Total biomass:
Model iAF1260.cmd: 4.425899407319197E-6
Model iJN1463.cmd: 8.781788437131521E-7
Model IMM904.cmd: 7.355982170346E-7
Cycle 17
Total biomass:
Model iAF1260.cmd: 5.3004797524647176E-6
Model iJN1463.cmd: 9.663720326013213E-7
Model IMM904.cmd: 8.000246574865939E-7
Cycle 18
Total biomass:
Model iAF1260.cmd: 6.337680170396881E-6
Model iJN1463.cmd: 1.0634630621919458E-6
Model IMM904.cmd: 8.69230189567442E-7
Cycle 19
Total biomass:
Model iAF1260.cmd: 7.568146339589872E-6
Model iJN1463.cmd: 1.170156634670592E-6
Model IMM904.cmd: 9.431001941740593E-7
Cycle 20
Total biomass:
Model iAF1260.cmd: 9.027688963317722E-6
Model iJN1463.cmd: 1.2872422521345094E-6
Model IMM904.cmd: 1.0217013042893729E-6
Cycle 21
Total biomass:
Model iAF1260.cmd: 1.0756620472565844E-5
Model iJN1463.cmd: 1.4156641818938862E-6
Model IMM904.cmd: 1.1045798455787448E-6
Cycle 22
Total biomass:
Model iAF1260.cmd: 1.2801319545129764E-5
Model iJN1463.cmd: 1.5566598963495496E-6
Model IMM904.cmd: 1.1907379325423696E-6
Cycle 23
Total biomass:
Model iAF1260.cmd: 1.5215676008817516E-5
Model iJN1463.cmd: 1.711482025951222E-6
Model IMM904.cmd: 1.280201135017978E-6

Cycle 24
Total biomass:
Model iAF1260.cmd: 1.8062301948365014E-5
Model iJN1463.cmd: 1.8814084742674658E-6
Model IMM904.cmd: 1.373353029725434E-6
Cycle 25
Total biomass:
Model iAF1260.cmd: 2.1420084240334795E-5
Model iJN1463.cmd: 2.0682677767685335E-6
Model IMM904.cmd: 1.4705099638617444E-6
Cycle 26
Total biomass:
Model iAF1260.cmd: 2.538152570656887E-5
Model iJN1463.cmd: 2.273306164739529E-6
Model IMM904.cmd: 1.5721946243284852E-6
Cycle 27
Total biomass:
Model iAF1260.cmd: 3.0055528092795136E-5
Model iJN1463.cmd: 2.4981444459485956E-6
Model IMM904.cmd: 1.6786802137556856E-6
Cycle 28
Total biomass:
Model iAF1260.cmd: 3.556963594076505E-5
Model iJN1463.cmd: 2.744424799844539E-6
Model IMM904.cmd: 1.7901592135931098E-6
Cycle 29
Total biomass:
Model iAF1260.cmd: 4.2072950210899615E-5
Model iJN1463.cmd: 3.013554322858417E-6
Model IMM904.cmd: 1.9072327354614235E-6
Cycle 30
Total biomass:
Model iAF1260.cmd: 4.974311413772454E-5
Model iJN1463.cmd: 3.3083294169265767E-6
Model IMM904.cmd: 2.029226786833434E-6
Cycle 31
Total biomass:
Model iAF1260.cmd: 5.8788508837782145E-5
Model iJN1463.cmd: 3.6307900028258745E-6
Model IMM904.cmd: 2.1563815092954772E-6
Cycle 32
Total biomass:
Model iAF1260.cmd: 6.945478454048308E-5
Model iJN1463.cmd: 3.9836542877033494E-6
Model IMM904.cmd: 2.289160604654881E-6
Cycle 33
Total biomass:
Model iAF1260.cmd: 8.201935338552495E-5
Model iJN1463.cmd: 4.369842941397872E-6
Model IMM904.cmd: 2.428503354688425E-6
Cycle 34
Total biomass:
Model iAF1260.cmd: 9.682194292963139E-5
Model iJN1463.cmd: 4.792575434943939E-6
Model IMM904.cmd: 2.574760116714867E-6
Cycle 35
Total biomass:
Model iAF1260.cmd: 1.1426165383625029E-4
Model iJN1463.cmd: 5.255269526253879E-6
Model IMM904.cmd: 2.728440102704999E-6
Cycle 36
Total biomass:
Model iAF1260.cmd: 1.348084827201532E-4
Model iJN1463.cmd: 5.761827516623746E-6
Model IMM904.cmd: 2.8902226928713263E-6
Cycle 37
Total biomass:
Model iAF1260.cmd: 1.5901530598033355E-4
Model iJN1463.cmd: 6.316620212455032E-6
Model IMM904.cmd: 3.059930583221676E-6
Cycle 38
Total biomass:
Model iAF1260.cmd: 1.875300553705498E-4
Model iJN1463.cmd: 6.9244935695205824E-6
Model IMM904.cmd: 3.2380086735318636E-6
Cycle 39
Total biomass:
Model iAF1260.cmd: 2.21119731839082E-4
Model iJN1463.cmd: 7.590841352558639E-6
Model IMM904.cmd: 3.4250756507218648E-6
Cycle 40
Total biomass:
Model iAF1260.cmd: 2.6069031195248755E-4

Model iJN1463.cmd: 8.321298312438491E-6
Model IMM904.cmd: 3.6219480982510523E-6
Cycle 41
Total biomass:
Model iAF1260.cmd: 3.073104473124529E-4
Model iJN1463.cmd: 9.122343495758201E-6
Model IMM904.cmd: 3.828766364615472E-6
Cycle 42
Total biomass:
Model iAF1260.cmd: 3.6223817890274654E-4
Model iJN1463.cmd: 1.0000729604486521E-5
Model IMM904.cmd: 4.046254777406139E-6
Cycle 43
Total biomass:
Model iAF1260.cmd: 4.2695742582012504E-4
Model iJN1463.cmd: 1.0963912127436159E-5
Model IMM904.cmd: 4.275211605019557E-6
Cycle 44
Total biomass:
Model iAF1260.cmd: 5.031560845184803E-4
Model iJN1463.cmd: 1.2019807336793936E-5
Model IMM904.cmd: 4.516493996438093E-6
Cycle 45
Total biomass:
Model iAF1260.cmd: 5.92693580934669E-4
Model iJN1463.cmd: 1.3177142175177065E-5
Model IMM904.cmd: 4.76922310450919E-6
Cycle 46
Total biomass:
Model iAF1260.cmd: 6.978064610044812E-4
Model iJN1463.cmd: 1.4445543171434583E-5
Model IMM904.cmd: 5.035279184853057E-6
Cycle 47
Total biomass:
Model iAF1260.cmd: 8.209057485992192E-4
Model iJN1463.cmd: 1.5835933789006385E-5
Model IMM904.cmd: 5.314938901905158E-6
Cycle 48
Total biomass:
Model iAF1260.cmd: 9.643913123121563E-4
Model iJN1463.cmd: 1.736291509749936E-5
Model IMM904.cmd: 5.608642336424808E-6
Cycle 49
Total biomass:
Model iAF1260.cmd: 0.0011314134175804415
Model iJN1463.cmd: 1.9036969508139425E-5
Model IMM904.cmd: 5.916840342961009E-6
Cycle 50
Total biomass:
Model iAF1260.cmd: 0.001325300135186928
Model iJN1463.cmd: 2.0871387066596823E-5
Model IMM904.cmd: 6.240983229930732E-6
Cycle 51
Total biomass:
Model iAF1260.cmd: 0.0015495201407335567
Model iJN1463.cmd: 2.288257819063285E-5
Model IMM904.cmd: 6.582605920457422E-6
Cycle 52
Total biomass:
Model iAF1260.cmd: 0.0018078498357911043
Model iJN1463.cmd: 2.509615178742004E-5
Model IMM904.cmd: 6.946692587952547E-6
Cycle 53
Total biomass:
Model iAF1260.cmd: 0.002103360210606817
Model iJN1463.cmd: 2.7531391334467043E-5
Model IMM904.cmd: 7.333438906118186E-6
Cycle 54
Total biomass:
Model iAF1260.cmd: 0.0024403670153131476
Model iJN1463.cmd: 3.0209326897555203E-5
Model IMM904.cmd: 7.742508357604369E-6
Cycle 55
Total biomass:
Model iAF1260.cmd: 0.002823148527779308
Model iJN1463.cmd: 3.3152971330404933E-5
Model IMM904.cmd: 8.175972337347972E-6
Cycle 56
Total biomass:
Model iAF1260.cmd: 0.0032565831748953273
Model iJN1463.cmd: 3.639294561294432E-5
Model IMM904.cmd: 8.635268732905389E-6
Cycle 57

Total biomass:
Model iAF1260.cmd: 0.0037458917200279274
Model iJN1463.cmd: 3.9958565664987594E-5
Model IMM904.cmd: 9.12115903809982E-6
Cycle 58
Total biomass:
Model iAF1260.cmd: 0.004296596066021189
Model iJN1463.cmd: 4.387602845648511E-5
Model IMM904.cmd: 9.635298377412757E-6
Cycle 59
Total biomass:
Model iAF1260.cmd: 0.004916514201018062
Model iJN1463.cmd: 4.8185138133107166E-5
Model IMM904.cmd: 1.0169727553836762E-5
Cycle 60
Total biomass:
Model iAF1260.cmd: 0.005613962818092702
Model iJN1463.cmd: 5.291232229530292E-5
Model IMM904.cmd: 1.073851810858533E-5
Cycle 61
Total biomass:
Model iAF1260.cmd: 0.006397410003535844
Model iJN1463.cmd: 5.8075900783549086E-5
Model IMM904.cmd: 1.1338362327273503E-5
Cycle 62
Total biomass:
Model iAF1260.cmd: 0.007273980453549188
Model iJN1463.cmd: 6.37285136629843E-5
Model IMM904.cmd: 1.1965783656731183E-5
Cycle 63
Total biomass:
Model iAF1260.cmd: 0.008251580640647144
Model iJN1463.cmd: 6.991156032059904E-5
Model IMM904.cmd: 1.2630185756684131E-5
Cycle 64
Total biomass:
Model iAF1260.cmd: 0.00934101850090121
Model iJN1463.cmd: 7.667993786132094E-5
Model IMM904.cmd: 1.3333205372459549E-5
Cycle 65
Total biomass:
Model iAF1260.cmd: 0.010554963141812559
Model iJN1463.cmd: 8.407606746826477E-5
Model IMM904.cmd: 1.4074176253902879E-5
Cycle 66
Total biomass:
Model iAF1260.cmd: 0.011907103514048981
Model iJN1463.cmd: 9.21001986262992E-5
Model IMM904.cmd: 1.4852762083969389E-5
Cycle 67
Total biomass:
Model iAF1260.cmd: 0.013412974439692374
Model iJN1463.cmd: 1.0068433704872679E-4
Model IMM904.cmd: 1.5676693524282674E-5
Cycle 68
Total biomass:
Model iAF1260.cmd: 0.015089358175365102
Model iJN1463.cmd: 1.097573988176112E-4
Model IMM904.cmd: 1.654486655559008E-5
Cycle 69
Total biomass:
Model iAF1260.cmd: 0.016955101447430763
Model iJN1463.cmd: 1.1933946294642962E-4
Model IMM904.cmd: 1.7468900962582856E-5
Cycle 70
Total biomass:
Model iAF1260.cmd: 0.019031512699706047
Model iJN1463.cmd: 1.294323191844827E-4
Model IMM904.cmd: 1.8440376899182592E-5
Cycle 71
Total biomass:
Model iAF1260.cmd: 0.02134373799922862
Model iJN1463.cmd: 1.398147302917941E-4
Model IMM904.cmd: 1.9456037216460035E-5
Cycle 72
Total biomass:
Model iAF1260.cmd: 0.023918509986339258
Model iJN1463.cmd: 1.503663115814693E-4
Model IMM904.cmd: 2.0509316726614333E-5
Cycle 73
Total biomass:
Model iAF1260.cmd: 0.026785317351709532
Model iJN1463.cmd: 1.6103331000442815E-4

Model IMM904.cmd: 2.160422046671457E-5
Cycle 74
Total biomass:
Model iAF1260.cmd: 0.029977001100728103
Model iJN1463.cmd: 1.718871903861339E-4
Model IMM904.cmd: 2.273219019570278E-5
Cycle 75
Total biomass:
Model iAF1260.cmd: 0.03353118045695808
Model iJN1463.cmd: 1.8288687377573278E-4
Model IMM904.cmd: 2.388609133407141E-5
Cycle 76
Total biomass:
Model iAF1260.cmd: 0.03748865975138111
Model iJN1463.cmd: 1.940519227463773E-4
Model IMM904.cmd: 2.5055229960865484E-5
Cycle 77
Total biomass:
Model iAF1260.cmd: 0.04189678926315927
Model iJN1463.cmd: 2.055479525091728E-4
Model IMM904.cmd: 2.6237246653597835E-5
Cycle 78
Total biomass:
Model iAF1260.cmd: 0.046807712644145086
Model iJN1463.cmd: 2.1742884984992368E-4
Model IMM904.cmd: 2.743399834905604E-5
Cycle 79
Total biomass:
Model iAF1260.cmd: 0.05227889437968658
Model iJN1463.cmd: 2.2968930615486024E-4
Model IMM904.cmd: 2.864642909239346E-5
Cycle 80
Total biomass:
Model iAF1260.cmd: 0.05837312548172254
Model iJN1463.cmd: 2.4236251337107428E-4
Model IMM904.cmd: 2.9877546318041026E-5
Cycle 81
Total biomass:
Model iAF1260.cmd: 0.06516222137533614
Model iJN1463.cmd: 2.553188099100748E-4
Model IMM904.cmd: 3.1120765362866685E-5
Cycle 82
Total biomass:
Model iAF1260.cmd: 0.07272566792820155
Model iJN1463.cmd: 2.685923332824668E-4
Model IMM904.cmd: 3.236117630296479E-5
Cycle 83
Total biomass:
Model iAF1260.cmd: 0.08115065409465257
Model iJN1463.cmd: 2.822172669135561E-4
Model IMM904.cmd: 3.3569034646244996E-5
Cycle 84
Total biomass:
Model iAF1260.cmd: 0.0905353137867446
Model iJN1463.cmd: 2.9623383657328934E-4
Model IMM904.cmd: 3.477249509230578E-5
Cycle 85
Total biomass:
Model iAF1260.cmd: 0.10098940926737077
Model iJN1463.cmd: 3.1067445668577604E-4
Model IMM904.cmd: 3.597797116607341E-5
Cycle 86
Total biomass:
Model iAF1260.cmd: 0.11263520730125406
Model iJN1463.cmd: 3.255793768120654E-4
Model IMM904.cmd: 3.716496971055278E-5
Cycle 87
Total biomass:
Model iAF1260.cmd: 0.12560843151736076
Model iJN1463.cmd: 3.408567871007019E-4
Model IMM904.cmd: 3.835355436868464E-5
Cycle 88
Total biomass:
Model iAF1260.cmd: 0.1400584629544695
Model iJN1463.cmd: 3.5652743328367054E-4
Model IMM904.cmd: 3.955083009780617E-5
Cycle 89
Total biomass:
Model iAF1260.cmd: 0.1561552335781205
Model iJN1463.cmd: 3.7250945476076223E-4
Model IMM904.cmd: 4.074854723903303E-5
Cycle 90
Total biomass:

Model iAF1260.cmd: 0.17408587449813975
Model iJN1463.cmd: 3.8868836247338317E-4
Model IMM904.cmd: 4.195248839136385E-5
Cycle 91
Total biomass:
Model iAF1260.cmd: 0.19405673027328826
Model iJN1463.cmd: 4.052317150440508E-4
Model IMM904.cmd: 4.316923550625013E-5
Cycle 92
Total biomass:
Model iAF1260.cmd: 0.2163013122645126
Model iJN1463.cmd: 4.2208713789156695E-4
Model IMM904.cmd: 4.439770064106537E-5
Cycle 93
Total biomass:
Model iAF1260.cmd: 0.24107742945042165
Model iJN1463.cmd: 4.392830192330581E-4
Model IMM904.cmd: 4.5616041985195483E-5
Cycle 94
Total biomass:
Model iAF1260.cmd: 0.2686731189928187
Model iJN1463.cmd: 4.568693676305064E-4
Model IMM904.cmd: 4.680455467298242E-5
Cycle 95
Total biomass:
Model iAF1260.cmd: 0.2994096882512026
Model iJN1463.cmd: 4.7501577777760037E-4
Model IMM904.cmd: 4.797291920605697E-5
Cycle 96
Total biomass:
Model iAF1260.cmd: 0.3336444928979975
Model iJN1463.cmd: 4.938283523650486E-4
Model IMM904.cmd: 4.916862324578571E-5
Cycle 97
Total biomass:
Model iAF1260.cmd: 0.37177571373391155
Model iJN1463.cmd: 5.133835251897645E-4
Model IMM904.cmd: 5.0389570658645285E-5
Cycle 98
Total biomass:
Model iAF1260.cmd: 0.414246869409363
Model iJN1463.cmd: 5.337154764791438E-4
Model IMM904.cmd: 5.162891227419294E-5
Cycle 99
Total biomass:
Model iAF1260.cmd: 0.4615523142896753
Model iJN1463.cmd: 5.548453752383975E-4
Model IMM904.cmd: 5.289401193641111E-5
Cycle 100
Total biomass:
Model iAF1260.cmd: 0.5142427058757193
Model iJN1463.cmd: 5.767527081139772E-4
Model IMM904.cmd: 5.4193656178838134E-5
Cycle 101
Total biomass:
Model iAF1260.cmd: 0.5729318542734657
Model iJN1463.cmd: 5.993375279876207E-4
Model IMM904.cmd: 5.55224014924747E-5
Cycle 102
Total biomass:
Model iAF1260.cmd: 0.6382999970820167
Model iJN1463.cmd: 6.225259785428972E-4
Model IMM904.cmd: 5.687875829489539E-5
Cycle 103
Total biomass:
Model iAF1260.cmd: 0.7111059928459542
Model iJN1463.cmd: 6.463151450868254E-4
Model IMM904.cmd: 5.825931971284181E-5
Cycle 104
Total biomass:
Model iAF1260.cmd: 0.7921974151820543
Model iJN1463.cmd: 6.708803183125644E-4
Model IMM904.cmd: 5.969475312358314E-5
Cycle 105
Total biomass:
Model iAF1260.cmd: 0.8825154414516082
Model iJN1463.cmd: 6.963510368086816E-4
Model IMM904.cmd: 6.11520263994457E-5
Cycle 106
Total biomass:
Model iAF1260.cmd: 0.9831109315990971
Model iJN1463.cmd: 7.227983358406863E-4
Model IMM904.cmd: 6.26489342183233E-5

Cycle 107
Total biomass:
Model iAF1260.cmd: 1.0951539515691477
Model iJN1463.cmd: 7.502575755011033E-4
Model IMM904.cmd: 6.419512903826323E-5
Cycle 108
Total biomass:
Model iAF1260.cmd: 1.2199455671870891
Model iJN1463.cmd: 7.787460095752349E-4
Model IMM904.cmd: 6.57870183006449E-5
Cycle 109
Total biomass:
Model iAF1260.cmd: 1.3589374611334741
Model iJN1463.cmd: 8.083562374512453E-4
Model IMM904.cmd: 6.743088114143289E-5
Cycle 110
Total biomass:
Model iAF1260.cmd: 1.513745325930901
Model iJN1463.cmd: 8.391023525313909E-4
Model IMM904.cmd: 6.91299387368835E-5
Cycle 111
Total biomass:
Model iAF1260.cmd: 1.686168475588168
Model iJN1463.cmd: 8.709705971702365E-4
Model IMM904.cmd: 7.087686773661552E-5
Cycle 112
Total biomass:
Model iAF1260.cmd: 1.8782112286717936
Model iJN1463.cmd: 9.039364913100799E-4
Model IMM904.cmd: 7.263647363504006E-5
Cycle 113
Total biomass:
Model iAF1260.cmd: 2.092107218683779
Model iJN1463.cmd: 9.379763497340879E-4
Model IMM904.cmd: 7.447447376655896E-5
Cycle 114
Total biomass:
Model iAF1260.cmd: 2.3303433081737075
Model iJN1463.cmd: 9.730556666097765E-4
Model IMM904.cmd: 7.638716752140503E-5
Cycle 115
Total biomass:
Model iAF1260.cmd: 2.595686664443536
Model iJN1463.cmd: 0.0010091499885608289
Model IMM904.cmd: 7.830637287190503E-5
Cycle 116
Total biomass:
Model iAF1260.cmd: 2.8912220854262407
Model iJN1463.cmd: 0.0010461435013882114
Model IMM904.cmd: 8.027784774488231E-5
Cycle 117
Total biomass:
Model iAF1260.cmd: 3.2203841079926923
Model iJN1463.cmd: 0.00108432587439485
Model IMM904.cmd: 8.229911201167198E-5
Cycle 118
Total biomass:
Model iAF1260.cmd: 3.586999718777457
Model iJN1463.cmd: 0.001123811727130402
Model IMM904.cmd: 8.437411699612057E-5
Cycle 119
Total biomass:
Model iAF1260.cmd: 3.9953287721014217
Model iJN1463.cmd: 0.001164887629724144
Model IMM904.cmd: 8.651594902921388E-5
Cycle 120
Total biomass:
Model iAF1260.cmd: 4.450116249517085
Model iJN1463.cmd: 0.0012076265822298998
Model IMM904.cmd: 8.87093517159383E-5
Cycle 121
Total biomass:
Model iAF1260.cmd: 4.956649590923665
Model iJN1463.cmd: 0.0012520397481745847
Model IMM904.cmd: 9.096735131210106E-5
Cycle 122
Total biomass:
Model iAF1260.cmd: 5.520817277230808
Model iJN1463.cmd: 0.0012981512736529892
Model IMM904.cmd: 9.331476009256637E-5
Cycle 123
Total biomass:
Model iAF1260.cmd: 6.149174668813196

Model iJN1463.cmd: 0.0013459618232287709
Model IMM904.cmd: 9.574336026322142E-5
Cycle 124
Total biomass:
Model iAF1260.cmd: 6.849025431304567
Model iJN1463.cmd: 0.001395481924476579
Model IMM904.cmd: 9.81742315062232E-5
Cycle 125
Total biomass:
Model iAF1260.cmd: 7.628505059404086
Model iJN1463.cmd: 0.0014467144734664765
Model IMM904.cmd: 1.0073778948833932E-4
Cycle 126
Total biomass:
Model iAF1260.cmd: 8.496671616069879
Model iJN1463.cmd: 0.00149966142108735
Model IMM904.cmd: 1.0328637059433377E-4
Cycle 127
Total biomass:
Model iAF1260.cmd: 9.463618713773348
Model iJN1463.cmd: 0.0015543461598028303
Model IMM904.cmd: 1.0597294434904354E-4
Cycle 128
Total biomass:
Model iAF1260.cmd: 10.540582422988816
Model iJN1463.cmd: 0.0016106537654261332
Model IMM904.cmd: 1.0861536659233105E-4
Cycle 129
Total biomass:
Model iAF1260.cmd: 11.740082232782735
Model iJN1463.cmd: 0.0016688212578035927
Model IMM904.cmd: 1.1133569459834842E-4
Cycle 130
Total biomass:
Model iAF1260.cmd: 13.076060082398744
Model iJN1463.cmd: 0.0017289379464598756
Model IMM904.cmd: 1.1417129989078216E-4
Cycle 131
Total biomass:
Model iAF1260.cmd: 14.5640424651605
Model iJN1463.cmd: 0.0017909066555128995
Model IMM904.cmd: 1.169841857782558E-4
Cycle 132
Total biomass:
Model iAF1260.cmd: 16.22132343172907
Model iJN1463.cmd: 0.0018547630298420689
Model IMM904.cmd: 1.1978926002300024E-4
Cycle 133
Total biomass:
Model iAF1260.cmd: 18.067165654057575
Model iJN1463.cmd: 0.0019208962662366482
Model IMM904.cmd: 1.2265995902202467E-4
Cycle 134
Total biomass:
Model iAF1260.cmd: 20.12302145141273
Model iJN1463.cmd: 0.0019894247328146853
Model IMM904.cmd: 1.256200480054919E-4
Cycle 135
Total biomass:
Model iAF1260.cmd: 22.412785936440205
Model iJN1463.cmd: 0.00206048855259289
Model IMM904.cmd: 1.285874232413416E-4
Cycle 136
Total biomass:
Model iAF1260.cmd: 24.96307430143884
Model iJN1463.cmd: 0.002134181629790804
Model IMM904.cmd: 1.3160031865310312E-4
Cycle 137
Total biomass:
Model iAF1260.cmd: 27.803522956832953
Model iJN1463.cmd: 0.0022105133561441575
Model IMM904.cmd: 1.3471326883574586E-4
Cycle 138
Total biomass:
Model iAF1260.cmd: 30.9671510226394
Model iJN1463.cmd: 0.0022894512204550744
Model IMM904.cmd: 1.3787475002543286E-4
Cycle 139
Total biomass:
Model iAF1260.cmd: 34.49072936403931
Model iJN1463.cmd: 0.002371016601380984
Model IMM904.cmd: 1.410328972293553E-4
Cycle 140

Total biomass:
Model iAF1260.cmd: 38.41520812588793
Model iJN1463.cmd: 0.002455223322625933
Model IMM904.cmd: 1.441986014797064E-4
Cycle 141
Total biomass:
Model iAF1260.cmd: 42.78619849681963
Model iJN1463.cmd: 0.0025420553203753618
Model IMM904.cmd: 1.4737262154223895E-4
Cycle 142
Total biomass:
Model iAF1260.cmd: 47.65450468283429
Model iJN1463.cmd: 0.0026316843096938773
Model IMM904.cmd: 1.5048826492308794E-4
Cycle 143
Total biomass:
Model iAF1260.cmd: 53.07671227903738
Model iJN1463.cmd: 0.002724383078598453
Model IMM904.cmd: 1.536064747722571E-4
Cycle 144
Total biomass:
Model iAF1260.cmd: 59.11583965378682
Model iJN1463.cmd: 0.0028201525830154985
Model IMM904.cmd: 1.566136120512149E-4
Cycle 145
Total biomass:
Model iAF1260.cmd: 65.84207912166157
Model iJN1463.cmd: 0.0029185921124613356
Model IMM904.cmd: 1.59404989274898E-4
Cycle 146
Total biomass:
Model iAF1260.cmd: 73.33360041387307
Model iJN1463.cmd: 0.002997940866095906
Model IMM904.cmd: 1.619438986411976E-4
Cycle 147
Total biomass:
Model iAF1260.cmd: 81.67746908621586
Model iJN1463.cmd: 0.0030571738766148274
Model IMM904.cmd: 1.6433888594872024E-4
Cycle 148
Total biomass:
Model iAF1260.cmd: 90.97066986904467
Model iJN1463.cmd: 0.0031185305406892616
Model IMM904.cmd: 1.6676424335163715E-4
Cycle 149
Total biomass:
Model iAF1260.cmd: 101.32121665303244
Model iJN1463.cmd: 0.003182086322233829
Model IMM904.cmd: 1.6926285853484437E-4
Cycle 150
Total biomass:
Model iAF1260.cmd: 112.84940847775039
Model iJN1463.cmd: 0.0032478949417719502
Model IMM904.cmd: 1.7179311595163455E-4
Cycle 151
Total biomass:
Model iAF1260.cmd: 125.6892301018297
Model iJN1463.cmd: 0.0033158787969954323
Model IMM904.cmd: 1.7427749442883164E-4
Cycle 152
Total biomass:
Model iAF1260.cmd: 139.98990754634994
Model iJN1463.cmd: 0.0033860521413852274
Model IMM904.cmd: 1.7683090917122775E-4
Cycle 153
Total biomass:
Model iAF1260.cmd: 155.91766185366882
Model iJN1463.cmd: 0.003458529032074728
Model IMM904.cmd: 1.7934332884401308E-4
Cycle 154
Total biomass:
Model iAF1260.cmd: 173.65761852788958
Model iJN1463.cmd: 0.0035332817714996594
Model IMM904.cmd: 1.8181176222234642E-4
Cycle 155
Total biomass:
Model iAF1260.cmd: 193.41594408145505
Model iJN1463.cmd: 0.0036102156853275932
Model IMM904.cmd: 1.8421136052999652E-4
Cycle 156
Total biomass:
Model iAF1260.cmd: 215.42230510529038
Model iJN1463.cmd: 0.0036904073247930494

Model IMM904.cmd: 1.8658566724361257E-4
Cycle 157
Total biomass:
Model iAF1260.cmd: 239.93245949530046
Model iJN1463.cmd: 0.0037740025462949817
Model IMM904.cmd: 1.8909827222575053E-4
Cycle 158
Total biomass:
Model iAF1260.cmd: 267.2312803755335
Model iJN1463.cmd: 0.003861100396400447
Model IMM904.cmd: 1.9167549314372015E-4
Cycle 159
Total biomass:
Model iAF1260.cmd: 297.63604966221544
Model iJN1463.cmd: 0.003951749570454996
Model IMM904.cmd: 1.94259199423183E-4
Cycle 160
Total biomass:
Model iAF1260.cmd: 327.2772382299816
Model iJN1463.cmd: 0.004046096391657885
Model IMM904.cmd: 1.969263039165141E-4
Cycle 161
Total biomass:
Model iAF1260.cmd: 350.7481937878132
Model iJN1463.cmd: 0.0041457484320376724
Model IMM904.cmd: 1.998044959625926E-4
Cycle 162
Total biomass:
Model iAF1260.cmd: 371.9392158589373
Model iJN1463.cmd: 0.004274138700114286
Model IMM904.cmd: 2.0295141659427363E-4
Cycle 163
Total biomass:
Model iAF1260.cmd: 388.30363981363047
Model iJN1463.cmd: 0.004413359945669326
Model IMM904.cmd: 2.0608218773682572E-4
Cycle 164
Total biomass:
Model iAF1260.cmd: 407.17421281633455
Model iJN1463.cmd: 0.004555319623485725
Model IMM904.cmd: 2.0932857463126908E-4
Cycle 165
Total biomass:
Model iAF1260.cmd: 414.7447657644551
Model iJN1463.cmd: 0.004710199368920831
Model IMM904.cmd: 2.126305309166711E-4
Cycle 166
Total biomass:
Model iAF1260.cmd: 416.143729020898
Model iJN1463.cmd: 0.004886598801958876
Model IMM904.cmd: 2.1606368489074105E-4
Cycle 167
Total biomass:
Model iAF1260.cmd: 418.06955154464896
Model iJN1463.cmd: 0.005072834752931141
Model IMM904.cmd: 2.1996916491670153E-4
Cycle 168
Total biomass:
Model iAF1260.cmd: 419.6648911419757
Model iJN1463.cmd: 0.005260875365154755
Model IMM904.cmd: 2.2403705364133257E-4
Cycle 169
Total biomass:
Model iAF1260.cmd: 421.4473193667625
Model iJN1463.cmd: 0.00544684552795521
Model IMM904.cmd: 2.2791143552289506E-4
Cycle 170
Total biomass:
Model iAF1260.cmd: 422.9225055989472
Model iJN1463.cmd: 0.005626710367920346
Model IMM904.cmd: 2.3181556935126933E-4
Cycle 171
Total biomass:
Model iAF1260.cmd: 424.39678258785494
Model iJN1463.cmd: 0.005806929032154904
Model IMM904.cmd: 2.3603648059738897E-4
Cycle 172
Total biomass:
Model iAF1260.cmd: 425.80497086128213
Model iJN1463.cmd: 0.006038768806324135
Model IMM904.cmd: 2.4067416931331014E-4
Cycle 173
Total biomass:

Model iAF1260.cmd: 426.7287329723812
Model iJN1463.cmd: 0.006275768249450515
Model IMM904.cmd: 2.4555061956891763E-4
Cycle 174
Total biomass:
Model iAF1260.cmd: 428.03742211353966
Model iJN1463.cmd: 0.006521572018508077
Model IMM904.cmd: 2.5073849898851394E-4
Cycle 175
Total biomass:
Model iAF1260.cmd: 429.17856964720323
Model iJN1463.cmd: 0.006769215109259862
Model IMM904.cmd: 2.5539921173216876E-4
Cycle 176
Total biomass:
Model iAF1260.cmd: 430.8465901764876
Model iJN1463.cmd: 0.007002399170088757
Model IMM904.cmd: 2.598961268689591E-4
Cycle 177
Total biomass:
Model iAF1260.cmd: 432.22538136028646
Model iJN1463.cmd: 0.00723832740607793
Model IMM904.cmd: 2.648987994723464E-4
Cycle 178
Total biomass:
Model iAF1260.cmd: 433.6852014700242
Model iJN1463.cmd: 0.007537599655618584
Model IMM904.cmd: 2.7032595884925626E-4
Cycle 179
Total biomass:
Model iAF1260.cmd: 434.5659972915695
Model iJN1463.cmd: 0.007880323400446834
Model IMM904.cmd: 2.7561621738346915E-4
Cycle 180
Total biomass:
Model iAF1260.cmd: 435.33578377636445
Model iJN1463.cmd: 0.008233616439024925
Model IMM904.cmd: 2.812483681217124E-4
Cycle 181
Total biomass:
Model iAF1260.cmd: 435.94724532777497
Model iJN1463.cmd: 0.008568033535914978
Model IMM904.cmd: 2.867657702133323E-4
Cycle 182
Total biomass:
Model iAF1260.cmd: 436.6212992045701
Model iJN1463.cmd: 0.008931265365991217
Model IMM904.cmd: 2.925437141229348E-4
Cycle 183
Total biomass:
Model iAF1260.cmd: 437.24641887498535
Model iJN1463.cmd: 0.009315040308258611
Model IMM904.cmd: 2.98212312671631E-4
Cycle 184
Total biomass:
Model iAF1260.cmd: 437.8392901663274
Model iJN1463.cmd: 0.009686495008857376
Model IMM904.cmd: 3.042759114774631E-4
Cycle 185
Total biomass:
Model iAF1260.cmd: 438.5004299693236
Model iJN1463.cmd: 0.0099759209359995
Model IMM904.cmd: 3.102777006141275E-4
Cycle 186
Total biomass:
Model iAF1260.cmd: 439.1374617542801
Model iJN1463.cmd: 0.010294669112368255
Model IMM904.cmd: 3.1635814514102787E-4
Cycle 187
Total biomass:
Model iAF1260.cmd: 439.6062111932893
Model iJN1463.cmd: 0.010591695686141007
Model IMM904.cmd: 3.2658351271133934E-4
Cycle 188
Total biomass:
Model iAF1260.cmd: 440.2993816374714
Model iJN1463.cmd: 0.010893974386921895
Model IMM904.cmd: 3.374489491800182E-4
Cycle 189
Total biomass:
Model iAF1260.cmd: 440.8902575046783
Model iJN1463.cmd: 0.011206181311020634
Model IMM904.cmd: 3.4818934551330655E-4

Cycle 190
Total biomass:
Model iAF1260.cmd: 441.6353106004391
Model iJN1463.cmd: 0.011587914376202848
Model IMM904.cmd: 3.62721567770264E-4
Cycle 191
Total biomass:
Model iAF1260.cmd: 442.31615478764434
Model iJN1463.cmd: 0.011929806460925634
Model IMM904.cmd: 3.7723930785485903E-4
Cycle 192
Total biomass:
Model iAF1260.cmd: 442.918973581044
Model iJN1463.cmd: 0.012258033853831972
Model IMM904.cmd: 3.9235935224773494E-4
Cycle 193
Total biomass:
Model iAF1260.cmd: 443.5363070854459
Model iJN1463.cmd: 0.012608099169821047
Model IMM904.cmd: 4.080884730533131E-4
Cycle 194
Total biomass:
Model iAF1260.cmd: 444.1310579275762
Model iJN1463.cmd: 0.01294633956563179
Model IMM904.cmd: 4.2399953414483767E-4
Cycle 195
Total biomass:
Model iAF1260.cmd: 444.7798451797058
Model iJN1463.cmd: 0.013300475297040776
Model IMM904.cmd: 4.3774049824984177E-4
Cycle 196
Total biomass:
Model iAF1260.cmd: 445.3672080305932
Model iJN1463.cmd: 0.013661165218354317
Model IMM904.cmd: 4.486871751936279E-4
Cycle 197
Total biomass:
Model iAF1260.cmd: 445.94166886902076
Model iJN1463.cmd: 0.014016029545426417
Model IMM904.cmd: 4.5868205418583347E-4
Cycle 198
Total biomass:
Model iAF1260.cmd: 446.55701793890785
Model iJN1463.cmd: 0.014506012510540525
Model IMM904.cmd: 4.6871088769544244E-4
Cycle 199
Total biomass:
Model iAF1260.cmd: 447.1538181379287
Model iJN1463.cmd: 0.014945982676171527
Model IMM904.cmd: 4.7950622349032866E-4
Cycle 200
Total biomass:
Model iAF1260.cmd: 447.76950166868266
Model iJN1463.cmd: 0.01537231800651552
Model IMM904.cmd: 4.903072987962308E-4
Cycle 201
Total biomass:
Model iAF1260.cmd: 448.3486677088229
Model iJN1463.cmd: 0.015795280907416533
Model IMM904.cmd: 5.014092914310649E-4
Cycle 202
Total biomass:
Model iAF1260.cmd: 448.98875763474564
Model iJN1463.cmd: 0.016328354224481707
Model IMM904.cmd: 5.123345031937943E-4
Cycle 203
Total biomass:
Model iAF1260.cmd: 449.58406492975956
Model iJN1463.cmd: 0.016794308614539025
Model IMM904.cmd: 5.243927659439991E-4
Cycle 204
Total biomass:
Model iAF1260.cmd: 450.25387215529094
Model iJN1463.cmd: 0.017265524074494252
Model IMM904.cmd: 5.36431740392279E-4
Cycle 205
Total biomass:
Model iAF1260.cmd: 450.9515066603663
Model iJN1463.cmd: 0.017733223090304374
Model IMM904.cmd: 5.490439702353515E-4
Cycle 206
Total biomass:
Model iAF1260.cmd: 451.5731677941514

Model iJN1463.cmd: 0.018199157777859028
Model IMM904.cmd: 5.610783703125833E-4
Cycle 207
Total biomass:
Model iAF1260.cmd: 452.12920668005233
Model iJN1463.cmd: 0.018706003879361964
Model IMM904.cmd: 5.73501759013026E-4
Cycle 208
Total biomass:
Model iAF1260.cmd: 452.71757384040524
Model iJN1463.cmd: 0.019210264326004353
Model IMM904.cmd: 5.860094067206539E-4
Cycle 209
Total biomass:
Model iAF1260.cmd: 453.3152644618299
Model iJN1463.cmd: 0.019753779540450662
Model IMM904.cmd: 5.988660618736235E-4
Cycle 210
Total biomass:
Model iAF1260.cmd: 453.8180037643952
Model iJN1463.cmd: 0.02029817669763521
Model IMM904.cmd: 6.119695407816236E-4
Cycle 211
Total biomass:
Model iAF1260.cmd: 454.4642516695001
Model iJN1463.cmd: 0.020862920929545475
Model IMM904.cmd: 6.257835505756895E-4
Cycle 212
Total biomass:
Model iAF1260.cmd: 455.1258572201191
Model iJN1463.cmd: 0.021439779245479407
Model IMM904.cmd: 6.390663336121615E-4
Cycle 213
Total biomass:
Model iAF1260.cmd: 455.88191176653174
Model iJN1463.cmd: 0.022028076160260004
Model IMM904.cmd: 6.531882996350198E-4
Cycle 214
Total biomass:
Model iAF1260.cmd: 456.49449992071203
Model iJN1463.cmd: 0.022647438283760823
Model IMM904.cmd: 6.673007228780779E-4
Cycle 215
Total biomass:
Model iAF1260.cmd: 457.15368302542186
Model iJN1463.cmd: 0.023275090371603493
Model IMM904.cmd: 6.818674477581349E-4
Cycle 216
Total biomass:
Model iAF1260.cmd: 457.7561768713487
Model iJN1463.cmd: 0.023910078471064147
Model IMM904.cmd: 6.982343384549266E-4
Cycle 217
Total biomass:
Model iAF1260.cmd: 458.37642036937825
Model iJN1463.cmd: 0.024557191014090797
Model IMM904.cmd: 7.135783375272097E-4
Cycle 218
Total biomass:
Model iAF1260.cmd: 459.22475252663395
Model iJN1463.cmd: 0.025235943344124268
Model IMM904.cmd: 7.292551221043256E-4
Cycle 219
Total biomass:
Model iAF1260.cmd: 459.7247034318829
Model iJN1463.cmd: 0.02595762643809763
Model IMM904.cmd: 7.454766360170604E-4
Cycle 220
Total biomass:
Model iAF1260.cmd: 460.27116148952837
Model iJN1463.cmd: 0.026699851884147193
Model IMM904.cmd: 7.622197647367127E-4
Cycle 221
Total biomass:
Model iAF1260.cmd: 460.8620370901825
Model iJN1463.cmd: 0.027461389550882332
Model IMM904.cmd: 7.788142644468444E-4
Cycle 222
Total biomass:
Model iAF1260.cmd: 461.4429053588291
Model iJN1463.cmd: 0.028242667692162268
Model IMM904.cmd: 7.956881656499529E-4
Cycle 223

Total biomass:
Model iAF1260.cmd: 462.1362324263467
Model iJN1463.cmd: 0.029365893310685186
Model IMM904.cmd: 8.139711112299833E-4
Cycle 224
Total biomass:
Model iAF1260.cmd: 462.71760275803905
Model iJN1463.cmd: 0.030373153477955727
Model IMM904.cmd: 8.319551938705971E-4
Cycle 225
Total biomass:
Model iAF1260.cmd: 463.38725158931413
Model iJN1463.cmd: 0.03149906272489967
Model IMM904.cmd: 8.50103397211795E-4
Cycle 226
Total biomass:
Model iAF1260.cmd: 464.0673083717667
Model iJN1463.cmd: 0.032389023681187776
Model IMM904.cmd: 8.688085925804054E-4
Cycle 227
Total biomass:
Model iAF1260.cmd: 464.6385826403562
Model iJN1463.cmd: 0.0333192177823759
Model IMM904.cmd: 8.88540462099232E-4
Cycle 228
Total biomass:
Model iAF1260.cmd: 465.2634324831665
Model iJN1463.cmd: 0.034286563897365716
Model IMM904.cmd: 9.086904415882441E-4
Cycle 229
Total biomass:
Model iAF1260.cmd: 465.93851705000566
Model iJN1463.cmd: 0.03528639667843622
Model IMM904.cmd: 9.292335627851636E-4
Cycle 230
Total biomass:
Model iAF1260.cmd: 466.4102571741179
Model iJN1463.cmd: 0.03666806261510911
Model IMM904.cmd: 9.501129934600229E-4
Cycle 231
Total biomass:
Model iAF1260.cmd: 467.09212486259764
Model iJN1463.cmd: 0.037753240950343034
Model IMM904.cmd: 9.70979840955494E-4
Cycle 232
Total biomass:
Model iAF1260.cmd: 467.7314414137815
Model iJN1463.cmd: 0.03883964765625934
Model IMM904.cmd: 9.954018152019235E-4
Cycle 233
Total biomass:
Model iAF1260.cmd: 468.4433010789284
Model iJN1463.cmd: 0.040305866034919376
Model IMM904.cmd: 0.0010183525700027385
Cycle 234
Total biomass:
Model iAF1260.cmd: 469.0697714133156
Model iJN1463.cmd: 0.04179263567155306
Model IMM904.cmd: 0.001041397525230419
Cycle 235
Total biomass:
Model iAF1260.cmd: 469.73012620621535
Model iJN1463.cmd: 0.04326278424599007
Model IMM904.cmd: 0.0010642554829248187
Cycle 236
Total biomass:
Model iAF1260.cmd: 470.34851842496136
Model iJN1463.cmd: 0.04455462329843444
Model IMM904.cmd: 0.001088058443713883
Cycle 237
Total biomass:
Model iAF1260.cmd: 470.96002543352415
Model iJN1463.cmd: 0.045863399107835906
Model IMM904.cmd: 0.0011129271600458484
Cycle 238
Total biomass:
Model iAF1260.cmd: 471.5751524661619
Model iJN1463.cmd: 0.047401218630052686
Model IMM904.cmd: 0.0011442937969316606
Cycle 239
Total biomass:
Model iAF1260.cmd: 472.18365641206844
Model iJN1463.cmd: 0.04909613172634377

Model IMM904.cmd: 0.0011706757984076667
Cycle 240
Total biomass:
Model iAF1260.cmd: 472.907032467451
Model iJN1463.cmd: 0.0507275388610603
Model IMM904.cmd: 0.001197687561798517
Cycle 241
Total biomass:
Model iAF1260.cmd: 473.55768934510667
Model iJN1463.cmd: 0.05232049828078341
Model IMM904.cmd: 0.0012243411780870806
Cycle 242
Total biomass:
Model iAF1260.cmd: 474.3110337260168
Model iJN1463.cmd: 0.053937536961223
Model IMM904.cmd: 0.001251455453983559
Cycle 243
Total biomass:
Model iAF1260.cmd: 474.81148232696586
Model iJN1463.cmd: 0.055610706447759256
Model IMM904.cmd: 0.0012793954342757237
Cycle 244
Total biomass:
Model iAF1260.cmd: 475.38383825090216
Model iJN1463.cmd: 0.05733183879205781
Model IMM904.cmd: 0.0013109083655283946
Cycle 245
Total biomass:
Model iAF1260.cmd: 476.1637774735016
Model iJN1463.cmd: 0.05908860040301365
Model IMM904.cmd: 0.0013420047403794769
Cycle 246
Total biomass:
Model iAF1260.cmd: 476.8516274997765
Model iJN1463.cmd: 0.06113595454501973
Model IMM904.cmd: 0.001371860193770738
Cycle 247
Total biomass:
Model iAF1260.cmd: 477.4858435645867
Model iJN1463.cmd: 0.063027022361217
Model IMM904.cmd: 0.0014007515357321902
Cycle 248
Total biomass:
Model iAF1260.cmd: 478.1527092003343
Model iJN1463.cmd: 0.06498003778724976
Model IMM904.cmd: 0.001432072093818676
Cycle 249
Total biomass:
Model iAF1260.cmd: 478.7404508572799
Model iJN1463.cmd: 0.06760564899330514
Model IMM904.cmd: 0.001462912029561566
Cycle 250
Total biomass:
Model iAF1260.cmd: 479.27605666181915
Model iJN1463.cmd: 0.07020320088036618
Model IMM904.cmd: 0.0014942265153225613
Cycle 251
Total biomass:
Model iAF1260.cmd: 479.89715938565723
Model iJN1463.cmd: 0.07236428991453464
Model IMM904.cmd: 0.0015310879615771974
Cycle 252
Total biomass:
Model iAF1260.cmd: 480.407662048563
Model iJN1463.cmd: 0.07496456178323875
Model IMM904.cmd: 0.0015650436886524145
Cycle 253
Total biomass:
Model iAF1260.cmd: 481.13108083048854
Model iJN1463.cmd: 0.07727045302005114
Model IMM904.cmd: 0.0015994980711461625
Cycle 254
Total biomass:
Model iAF1260.cmd: 481.7723187454139
Model iJN1463.cmd: 0.07990901857970159
Model IMM904.cmd: 0.0016348569286831103
Cycle 255
Total biomass:
Model iAF1260.cmd: 482.36411101618637
Model iJN1463.cmd: 0.08278351222470769
Model IMM904.cmd: 0.0016699327787913245
Cycle 256
Total biomass:

Model iAF1260.cmd: 482.99550662773464
Model iJN1463.cmd: 0.08533142349026226
Model IMM904.cmd: 0.0017034361739941873
Cycle 257
Total biomass:
Model iAF1260.cmd: 483.5873999792129
Model iJN1463.cmd: 0.08798006960199986
Model IMM904.cmd: 0.0017385775730959052
Cycle 258
Total biomass:
Model iAF1260.cmd: 484.16246550267164
Model iJN1463.cmd: 0.09074901700232042
Model IMM904.cmd: 0.001775467533553353
Cycle 259
Total biomass:
Model iAF1260.cmd: 484.82770920236294
Model iJN1463.cmd: 0.09359380870221193
Model IMM904.cmd: 0.0018122504785054066
Cycle 260
Total biomass:
Model iAF1260.cmd: 485.3763803979023
Model iJN1463.cmd: 0.09654186870479456
Model IMM904.cmd: 0.0018490631734282771
Cycle 261
Total biomass:
Model iAF1260.cmd: 485.95149320877937
Model iJN1463.cmd: 0.09960412354564216
Model IMM904.cmd: 0.0018857437100034899
Cycle 262
Total biomass:
Model iAF1260.cmd: 486.58453435741137
Model iJN1463.cmd: 0.1027713369584802
Model IMM904.cmd: 0.0019227592192392036
Cycle 263
Total biomass:
Model iAF1260.cmd: 487.26712947609826
Model iJN1463.cmd: 0.10643628276494871
Model IMM904.cmd: 0.0019609815630906
Cycle 264
Total biomass:
Model iAF1260.cmd: 487.977781217684
Model iJN1463.cmd: 0.10981303256871879
Model IMM904.cmd: 0.0019976968436242934
Cycle 265
Total biomass:
Model iAF1260.cmd: 488.61597255015164
Model iJN1463.cmd: 0.11332497569095422
Model IMM904.cmd: 0.002034801421786652
Cycle 266
Total biomass:
Model iAF1260.cmd: 489.2936896703767
Model iJN1463.cmd: 0.11695928675097285
Model IMM904.cmd: 0.0020733841790561945
Cycle 267
Total biomass:
Model iAF1260.cmd: 489.94586194459373
Model iJN1463.cmd: 0.1207964667796861
Model IMM904.cmd: 0.0021117804799172107
Cycle 268
Total biomass:
Model iAF1260.cmd: 490.61373969600464
Model iJN1463.cmd: 0.12474445267631844
Model IMM904.cmd: 0.0021522887507398614
Cycle 269
Total biomass:
Model iAF1260.cmd: 491.177881785381
Model iJN1463.cmd: 0.12882058200539015
Model IMM904.cmd: 0.0021938876083057494
Cycle 270
Total biomass:
Model iAF1260.cmd: 491.96068729226704
Model iJN1463.cmd: 0.133278777619422
Model IMM904.cmd: 0.002237125440884861
Cycle 271
Total biomass:
Model iAF1260.cmd: 492.60685793270306
Model iJN1463.cmd: 0.13768235876763468
Model IMM904.cmd: 0.002279838563492011
Cycle 272
Total biomass:
Model iAF1260.cmd: 493.1620800169578
Model iJN1463.cmd: 0.14224069316353624
Model IMM904.cmd: 0.0023219237562190948

Cycle 273
Total biomass:
Model iAF1260.cmd: 493.9628239807197
Model iJN1463.cmd: 0.14695509237594628
Model IMM904.cmd: 0.0023627670604177264
Cycle 274
Total biomass:
Model iAF1260.cmd: 494.612103701016
Model iJN1463.cmd: 0.15183459463173601
Model IMM904.cmd: 0.0024069701276757615
Cycle 275
Total biomass:
Model iAF1260.cmd: 495.2640998232285
Model iJN1463.cmd: 0.1568960874828184
Model IMM904.cmd: 0.0024504611544823455
Cycle 276
Total biomass:
Model iAF1260.cmd: 496.0103892731558
Model iJN1463.cmd: 0.16212717639163035
Model IMM904.cmd: 0.0024931267109310424
Cycle 277
Total biomass:
Model iAF1260.cmd: 496.66338157983546
Model iJN1463.cmd: 0.16756499234180294
Model IMM904.cmd: 0.0025366651066071667
Cycle 278
Total biomass:
Model iAF1260.cmd: 497.45286591344575
Model iJN1463.cmd: 0.1732091261095265
Model IMM904.cmd: 0.0025816765531590123
Cycle 279
Total biomass:
Model iAF1260.cmd: 498.0711400018972
Model iJN1463.cmd: 0.17903600071065137
Model IMM904.cmd: 0.0026263318769641202
Cycle 280
Total biomass:
Model iAF1260.cmd: 498.6952838831214
Model iJN1463.cmd: 0.18510230188582863
Model IMM904.cmd: 0.0026715704776187105
Cycle 281
Total biomass:
Model iAF1260.cmd: 499.40502405577354
Model iJN1463.cmd: 0.1913807028085432
Model IMM904.cmd: 0.0027161064643165898
Cycle 282
Total biomass:
Model iAF1260.cmd: 499.97935523208315
Model iJN1463.cmd: 0.19785684855221888
Model IMM904.cmd: 0.0027603831875339124
Cycle 283
Total biomass:
Model iAF1260.cmd: 500.649358235755
Model iJN1463.cmd: 0.20453120158144264
Model IMM904.cmd: 0.0028028596174692975
Cycle 284
Total biomass:
Model iAF1260.cmd: 501.31975476580504
Model iJN1463.cmd: 0.21154388922417355
Model IMM904.cmd: 0.002845257510431344
Cycle 285
Total biomass:
Model iAF1260.cmd: 501.9938368324114
Model iJN1463.cmd: 0.2187953320065865
Model IMM904.cmd: 0.00288828445141091
Cycle 286
Total biomass:
Model iAF1260.cmd: 502.6613254372243
Model iJN1463.cmd: 0.22629341918689908
Model IMM904.cmd: 0.0029305941237234424
Cycle 287
Total biomass:
Model iAF1260.cmd: 503.4146494192589
Model iJN1463.cmd: 0.2340645337347778
Model IMM904.cmd: 0.002974484759056435
Cycle 288
Total biomass:
Model iAF1260.cmd: 503.9704600640156
Model iJN1463.cmd: 0.24210245649915443
Model IMM904.cmd: 0.00301776892529236
Cycle 289
Total biomass:
Model iAF1260.cmd: 504.6256637722918

Model iJN1463.cmd: 0.25044047507172934
Model IMM904.cmd: 0.0030628572145928483
Cycle 290
Total biomass:
Model iAF1260.cmd: 505.3392249324961
Model iJN1463.cmd: 0.258994819919807
Model IMM904.cmd: 0.0031060632055822856
Cycle 291
Total biomass:
Model iAF1260.cmd: 506.00598343811015
Model iJN1463.cmd: 0.2683982190140466
Model IMM904.cmd: 0.0031500541087359896
Cycle 292
Total biomass:
Model iAF1260.cmd: 506.6141246110779
Model iJN1463.cmd: 0.27866549057983403
Model IMM904.cmd: 0.00319505139170109
Cycle 293
Total biomass:
Model iAF1260.cmd: 507.39503821331687
Model iJN1463.cmd: 0.2883040154086792
Model IMM904.cmd: 0.003240360762275532
Cycle 294
Total biomass:
Model iAF1260.cmd: 508.29938220330496
Model iJN1463.cmd: 0.29857059903512034
Model IMM904.cmd: 0.0032843220054951812
Cycle 295
Total biomass:
Model iAF1260.cmd: 508.94094502866955
Model iJN1463.cmd: 0.308877541728262
Model IMM904.cmd: 0.0033298616586419807
Cycle 296
Total biomass:
Model iAF1260.cmd: 509.6637448261554
Model iJN1463.cmd: 0.3196344655028048
Model IMM904.cmd: 0.0033739945672730453
Cycle 297
Total biomass:
Model iAF1260.cmd: 510.31267798724286
Model iJN1463.cmd: 0.33115051914686683
Model IMM904.cmd: 0.0034170990885191476
Cycle 298
Total biomass:
Model iAF1260.cmd: 510.94140207625304
Model iJN1463.cmd: 0.3431175458883289
Model IMM904.cmd: 0.003459504152398386
Cycle 299
Total biomass:
Model iAF1260.cmd: 511.66553602436596
Model iJN1463.cmd: 0.3550553801798335
Model IMM904.cmd: 0.0035021784380279905
Cycle 300
Total biomass:
Model iAF1260.cmd: 512.3442696549793
Model iJN1463.cmd: 0.36743155517465986
Model IMM904.cmd: 0.0035432018388547007
Cycle 301
Total biomass:
Model iAF1260.cmd: 512.950156485364
Model iJN1463.cmd: 0.3802271183651635
Model IMM904.cmd: 0.0035834267088378008
Cycle 302
Total biomass:
Model iAF1260.cmd: 513.594839531895
Model iJN1463.cmd: 0.39358320970092175
Model IMM904.cmd: 0.0036212500461833153
Cycle 303
Total biomass:
Model iAF1260.cmd: 514.4426620429558
Model iJN1463.cmd: 0.4075593221667557
Model IMM904.cmd: 0.0036578323883798914
Cycle 304
Total biomass:
Model iAF1260.cmd: 515.0788651668676
Model iJN1463.cmd: 0.42202792563971775
Model IMM904.cmd: 0.0036948072031774753
Cycle 305
Total biomass:
Model iAF1260.cmd: 515.8876173948966
Model iJN1463.cmd: 0.4369824141140533
Model IMM904.cmd: 0.0037319241116338885
Cycle 306

Total biomass:
Model iAF1260.cmd: 516.6068567442251
Model iJN1463.cmd: 0.45238831909435184
Model IMM904.cmd: 0.0037646978881012046
Cycle 307
Total biomass:
Model iAF1260.cmd: 517.3418394781896
Model iJN1463.cmd: 0.4682183710567542
Model IMM904.cmd: 0.0037942127471159914
Cycle 308
Total biomass:
Model iAF1260.cmd: 518.1000717003228
Model iJN1463.cmd: 0.4843579563347251
Model IMM904.cmd: 0.0038207402504787545
Cycle 309
Total biomass:
Model iAF1260.cmd: 518.8324660458455
Model iJN1463.cmd: 0.5010880459525173
Model IMM904.cmd: 0.003842377751070113
Cycle 310
Total biomass:
Model iAF1260.cmd: 519.5413172011082
Model iJN1463.cmd: 0.5184624674049977
Model IMM904.cmd: 0.0038580502762094212
Cycle 311
Total biomass:
Model iAF1260.cmd: 520.2222952498732
Model iJN1463.cmd: 0.5364973926652651
Model IMM904.cmd: 0.0038660241838950264
Cycle 312
Total biomass:
Model iAF1260.cmd: 520.981228942415
Model iJN1463.cmd: 0.5548877729229096
Model IMM904.cmd: 0.0038682335184249943
Cycle 313
Total biomass:
Model iAF1260.cmd: 521.6522053083445
Model iJN1463.cmd: 0.573825962128123
Model IMM904.cmd: 0.0038707372926991804
Cycle 314
Total biomass:
Model iAF1260.cmd: 522.4454436259422
Model iJN1463.cmd: 0.5931161490667136
Model IMM904.cmd: 0.003873261702513468
Cycle 315
Total biomass:
Model iAF1260.cmd: 523.1573232563801
Model iJN1463.cmd: 0.6126993737171382
Model IMM904.cmd: 0.0038760963692109386
Cycle 316
Total biomass:
Model iAF1260.cmd: 523.8557599978604
Model iJN1463.cmd: 0.6326530319199386
Model IMM904.cmd: 0.0038791754434362286
Cycle 317
Total biomass:
Model iAF1260.cmd: 524.5567447058219
Model iJN1463.cmd: 0.6534164309788751
Model IMM904.cmd: 0.0038823106492517716
Cycle 318
Total biomass:
Model iAF1260.cmd: 525.2651405098546
Model iJN1463.cmd: 0.6748264895957097
Model IMM904.cmd: 0.003885320963932609
Cycle 319
Total biomass:
Model iAF1260.cmd: 526.0273261694877
Model iJN1463.cmd: 0.6968270463152972
Model IMM904.cmd: 0.0038890679900088106
Cycle 320
Total biomass:
Model iAF1260.cmd: 526.7146602306512
Model iJN1463.cmd: 0.7193170394668206
Model IMM904.cmd: 0.0038929799614210283
Cycle 321
Total biomass:
Model iAF1260.cmd: 527.3914483746403
Model iJN1463.cmd: 0.7423135324822066
Model IMM904.cmd: 0.0038970546544522507
Cycle 322
Total biomass:
Model iAF1260.cmd: 527.9525399553652
Model iJN1463.cmd: 0.7658480571681107

Model IMM904.cmd: 0.0039020452038325787
Cycle 323
Total biomass:
Model iAF1260.cmd: 528.693479340006
Model iJN1463.cmd: 0.7902147403010038
Model IMM904.cmd: 0.0039066915458284
Cycle 324
Total biomass:
Model iAF1260.cmd: 529.3175929867255
Model iJN1463.cmd: 0.8153616352807026
Model IMM904.cmd: 0.003911852597767806
Cycle 325
Total biomass:
Model iAF1260.cmd: 530.0875366011048
Model iJN1463.cmd: 0.8411879536950394
Model IMM904.cmd: 0.003917549860761229
Cycle 326
Total biomass:
Model iAF1260.cmd: 530.7737875835321
Model iJN1463.cmd: 0.8675848086198659
Model IMM904.cmd: 0.003923156847053022
Cycle 327
Total biomass:
Model iAF1260.cmd: 531.4980911145682
Model iJN1463.cmd: 0.8946085160724486
Model IMM904.cmd: 0.003929362954264717
Cycle 328
Total biomass:
Model iAF1260.cmd: 532.2852526441608
Model iJN1463.cmd: 0.9228807274337321
Model IMM904.cmd: 0.003935826076150653
Cycle 329
Total biomass:
Model iAF1260.cmd: 533.0216222471118
Model iJN1463.cmd: 0.9516709124005148
Model IMM904.cmd: 0.003942067225742564
Cycle 330
Total biomass:
Model iAF1260.cmd: 533.6676086732839
Model iJN1463.cmd: 0.9805226216210059
Model IMM904.cmd: 0.003949802804278168
Cycle 331
Total biomass:
Model iAF1260.cmd: 534.2742909495461
Model iJN1463.cmd: 1.0100011561910869
Model IMM904.cmd: 0.003957343654543881
Cycle 332
Total biomass:
Model iAF1260.cmd: 534.9989562243434
Model iJN1463.cmd: 1.0401691030186824
Model IMM904.cmd: 0.003965473258586936
Cycle 333
Total biomass:
Model iAF1260.cmd: 535.8246500278303
Model iJN1463.cmd: 1.0707962171057799
Model IMM904.cmd: 0.003974212294862054
Cycle 334
Total biomass:
Model iAF1260.cmd: 536.5047304693354
Model iJN1463.cmd: 1.1032430619090852
Model IMM904.cmd: 0.003983768803489644
Cycle 335
Total biomass:
Model iAF1260.cmd: 537.2409436683512
Model iJN1463.cmd: 1.1359469519419816
Model IMM904.cmd: 0.003993362400191872
Cycle 336
Total biomass:
Model iAF1260.cmd: 538.052600968905
Model iJN1463.cmd: 1.1705090429149199
Model IMM904.cmd: 0.0040036248974480715
Cycle 337
Total biomass:
Model iAF1260.cmd: 538.6044221191096
Model iJN1463.cmd: 1.204485226014008
Model IMM904.cmd: 0.004013967720135189
Cycle 338
Total biomass:
Model iAF1260.cmd: 539.2087100649661
Model iJN1463.cmd: 1.240572876972612
Model IMM904.cmd: 0.0040256976997477
Cycle 339
Total biomass:

Model iAF1260.cmd: 540.1015058792498
Model iJN1463.cmd: 1.2747192507027032
Model IMM904.cmd: 0.004038294653265491
Cycle 340
Total biomass:
Model iAF1260.cmd: 540.841124221922
Model iJN1463.cmd: 1.3091746869621934
Model IMM904.cmd: 0.004051647542520984
Cycle 341
Total biomass:
Model iAF1260.cmd: 541.4396452485129
Model iJN1463.cmd: 1.3461720842988123
Model IMM904.cmd: 0.004065538208484643
Cycle 342
Total biomass:
Model iAF1260.cmd: 542.2182730019592
Model iJN1463.cmd: 1.383207237781583
Model IMM904.cmd: 0.00408070942650425
Cycle 343
Total biomass:
Model iAF1260.cmd: 543.0862002163958
Model iJN1463.cmd: 1.4205447731266834
Model IMM904.cmd: 0.0040965579545508245
Cycle 344
Total biomass:
Model iAF1260.cmd: 543.9110394909833
Model iJN1463.cmd: 1.4572672443268777
Model IMM904.cmd: 0.00411333165421802
Cycle 345
Total biomass:
Model iAF1260.cmd: 544.6878333829883
Model iJN1463.cmd: 1.4937656375263038
Model IMM904.cmd: 0.0041302802079998015
Cycle 346
Total biomass:
Model iAF1260.cmd: 545.4655089002808
Model iJN1463.cmd: 1.5307209496807692
Model IMM904.cmd: 0.004148329681131489
Cycle 347
Total biomass:
Model iAF1260.cmd: 546.3373400725555
Model iJN1463.cmd: 1.5680729901827362
Model IMM904.cmd: 0.004167371033974581
Cycle 348
Total biomass:
Model iAF1260.cmd: 547.1199896897357
Model iJN1463.cmd: 1.607430450149621
Model IMM904.cmd: 0.004187208677210137
Cycle 349
Total biomass:
Model iAF1260.cmd: 547.9268557875986
Model iJN1463.cmd: 1.6456891093508859
Model IMM904.cmd: 0.004208930823102657
Cycle 350
Total biomass:
Model iAF1260.cmd: 548.6573740234717
Model iJN1463.cmd: 1.6842744255025566
Model IMM904.cmd: 0.0042321308057450095
Cycle 351
Total biomass:
Model iAF1260.cmd: 549.2779253807134
Model iJN1463.cmd: 1.7231392715213263
Model IMM904.cmd: 0.004257348159490252
Cycle 352
Total biomass:
Model iAF1260.cmd: 549.966026105605
Model iJN1463.cmd: 1.7622238145067006
Model IMM904.cmd: 0.00428311933952779
Cycle 353
Total biomass:
Model iAF1260.cmd: 550.7435117222707
Model iJN1463.cmd: 1.8015118767186953
Model IMM904.cmd: 0.004309882686831828
Cycle 354
Total biomass:
Model iAF1260.cmd: 551.4264418626761
Model iJN1463.cmd: 1.8410354910515954
Model IMM904.cmd: 0.004338157388678686
Cycle 355
Total biomass:
Model iAF1260.cmd: 552.2234384990649
Model iJN1463.cmd: 1.8807766001064747
Model IMM904.cmd: 0.004368005345641063

Cycle 356
Total biomass:
Model iAF1260.cmd: 553.0309854042086
Model iJN1463.cmd: 1.9207561114739862
Model IMM904.cmd: 0.00439880674036328
Cycle 357
Total biomass:
Model iAF1260.cmd: 553.7192755181495
Model iJN1463.cmd: 1.9619795496141603
Model IMM904.cmd: 0.004431905794492221
Cycle 358
Total biomass:
Model iAF1260.cmd: 554.536633628594
Model iJN1463.cmd: 2.0024843294335293
Model IMM904.cmd: 0.004465911733356352
Cycle 359
Total biomass:
Model iAF1260.cmd: 555.19700201543
Model iJN1463.cmd: 2.04330002679965
Model IMM904.cmd: 0.004499051636938475
Cycle 360
Total biomass:
Model iAF1260.cmd: 555.97519244924
Model iJN1463.cmd: 2.0844034156339863
Model IMM904.cmd: 0.004535820445566982
Cycle 361
Total biomass:
Model iAF1260.cmd: 556.7009794390291
Model iJN1463.cmd: 2.1257411601068785
Model IMM904.cmd: 0.004574040506638953
Cycle 362
Total biomass:
Model iAF1260.cmd: 557.5169199821305
Model iJN1463.cmd: 2.1673390095176344
Model IMM904.cmd: 0.0046128036990802975
Cycle 363
Total biomass:
Model iAF1260.cmd: 558.145869479556
Model iJN1463.cmd: 2.2091731318289662
Model IMM904.cmd: 0.004655392274898872
Cycle 364
Total biomass:
Model iAF1260.cmd: 558.9465105997386
Model iJN1463.cmd: 2.2512454115998812
Model IMM904.cmd: 0.004699129907432088
Cycle 365
Total biomass:
Model iAF1260.cmd: 559.6618799406046
Model iJN1463.cmd: 2.2945520268954924
Model IMM904.cmd: 0.0047481788450680585
Cycle 366
Total biomass:
Model iAF1260.cmd: 560.2970234371705
Model iJN1463.cmd: 2.3400380757778727
Model IMM904.cmd: 0.00479766126624251
Cycle 367
Total biomass:
Model iAF1260.cmd: 561.1316316841267
Model iJN1463.cmd: 2.384358097081757
Model IMM904.cmd: 0.004851464745344412
Cycle 368
Total biomass:
Model iAF1260.cmd: 561.9005175671398
Model iJN1463.cmd: 2.4270929512586426
Model IMM904.cmd: 0.004905323713441573
Cycle 369
Total biomass:
Model iAF1260.cmd: 562.661072867033
Model iJN1463.cmd: 2.4699045862037745
Model IMM904.cmd: 0.004962274750958851
Cycle 370
Total biomass:
Model iAF1260.cmd: 563.4732589796038
Model iJN1463.cmd: 2.5127871704785787
Model IMM904.cmd: 0.0050187256863982
Cycle 371
Total biomass:
Model iAF1260.cmd: 564.4224643882682
Model iJN1463.cmd: 2.5557567711925846
Model IMM904.cmd: 0.005079009666041796
Cycle 372
Total biomass:
Model iAF1260.cmd: 565.2879540430753

Model iJN1463.cmd: 2.5988340781698636
Model IMM904.cmd: 0.0051424632169404395
Cycle 373
Total biomass:
Model iAF1260.cmd: 566.0576401154558
Model iJN1463.cmd: 2.6419865509206897
Model IMM904.cmd: 0.005208606378257998
Cycle 374
Total biomass:
Model iAF1260.cmd: 566.8873288010955
Model iJN1463.cmd: 2.6857539238053416
Model IMM904.cmd: 0.005278665013880089
Cycle 375
Total biomass:
Model iAF1260.cmd: 567.7101081818797
Model iJN1463.cmd: 2.7296716580814295
Model IMM904.cmd: 0.005346025842535011
Cycle 376
Total biomass:
Model iAF1260.cmd: 568.4996165377266
Model iJN1463.cmd: 2.773145831584161
Model IMM904.cmd: 0.005419835420869041
Cycle 377
Total biomass:
Model iAF1260.cmd: 569.3125272811812
Model iJN1463.cmd: 2.81671505807626
Model IMM904.cmd: 0.00549839555271877
Cycle 378
Total biomass:
Model iAF1260.cmd: 570.1589660429202
Model iJN1463.cmd: 2.8603828176861015
Model IMM904.cmd: 0.0055793420217839906
Cycle 379
Total biomass:
Model iAF1260.cmd: 570.7805204022962
Model iJN1463.cmd: 2.9041650294528263
Model IMM904.cmd: 0.00566537487931424
Cycle 380
Total biomass:
Model iAF1260.cmd: 571.5953056523612
Model iJN1463.cmd: 2.951336222008033
Model IMM904.cmd: 0.005757443696448157
Cycle 381
Total biomass:
Model iAF1260.cmd: 572.209905692437
Model iJN1463.cmd: 2.9953876078393615
Model IMM904.cmd: 0.00585033209458469
Cycle 382
Total biomass:
Model iAF1260.cmd: 573.0377934996999
Model iJN1463.cmd: 3.0447782531131953
Model IMM904.cmd: 0.00594221464266672
Cycle 383
Total biomass:
Model iAF1260.cmd: 573.8646808561291
Model iJN1463.cmd: 3.0914117888350154
Model IMM904.cmd: 0.006042978126802769
Cycle 384
Total biomass:
Model iAF1260.cmd: 574.4856931752215
Model iJN1463.cmd: 3.141164935658565
Model IMM904.cmd: 0.006143431663577302
Cycle 385
Total biomass:
Model iAF1260.cmd: 575.1778287872615
Model iJN1463.cmd: 3.191109892318396
Model IMM904.cmd: 0.006253952240550604
Cycle 386
Total biomass:
Model iAF1260.cmd: 576.0221015420952
Model iJN1463.cmd: 3.2359411852990805
Model IMM904.cmd: 0.006369672773487688
Cycle 387
Total biomass:
Model iAF1260.cmd: 576.7989453638247
Model iJN1463.cmd: 3.2820113755481883
Model IMM904.cmd: 0.006489457824136301
Cycle 388
Total biomass:
Model iAF1260.cmd: 577.5236974802933
Model iJN1463.cmd: 3.329270268561335
Model IMM904.cmd: 0.006608810593864823
Cycle 389

Total biomass:
Model iAF1260.cmd: 578.4376691788432
Model iJN1463.cmd: 3.3756827388027433
Model IMM904.cmd: 0.006739734719973002
Cycle 390
Total biomass:
Model iAF1260.cmd: 579.2763944045298
Model iJN1463.cmd: 3.426219144323132
Model IMM904.cmd: 0.006862807063302508
Cycle 391
Total biomass:
Model iAF1260.cmd: 580.0413189334316
Model iJN1463.cmd: 3.471763468636994
Model IMM904.cmd: 0.007004937007550505
Cycle 392
Total biomass:
Model iAF1260.cmd: 580.9715928074513
Model iJN1463.cmd: 3.517428660819745
Model IMM904.cmd: 0.007153729706326398
Cycle 393
Total biomass:
Model iAF1260.cmd: 581.7404425287033
Model iJN1463.cmd: 3.56316870149363
Model IMM904.cmd: 0.0073096031183229795
Cycle 394
Total biomass:
Model iAF1260.cmd: 582.4860835568184
Model iJN1463.cmd: 3.6090094882712216
Model IMM904.cmd: 0.007468745083165033
Cycle 395
Total biomass:
Model iAF1260.cmd: 583.1663721525723
Model iJN1463.cmd: 3.6549545645659305
Model IMM904.cmd: 0.007632478447336943
Cycle 396
Total biomass:
Model iAF1260.cmd: 583.8919902312263
Model iJN1463.cmd: 3.7010095624177106
Model IMM904.cmd: 0.007800563833598674
Cycle 397
Total biomass:
Model iAF1260.cmd: 584.7443581038993
Model iJN1463.cmd: 3.7471895926933256
Model IMM904.cmd: 0.007959272567948181
Cycle 398
Total biomass:
Model iAF1260.cmd: 585.4475755127414
Model iJN1463.cmd: 3.793563756880455
Model IMM904.cmd: 0.008126719803579792
Cycle 399
Total biomass:
Model iAF1260.cmd: 586.2231759754011
Model iJN1463.cmd: 3.84010745439258
Model IMM904.cmd: 0.00830496469749992
Cycle 400
Total biomass:
Model iAF1260.cmd: 586.8583002738063
Model iJN1463.cmd: 3.886802218270052
Model IMM904.cmd: 0.008491057171620544
Cycle 401
Total biomass:
Model iAF1260.cmd: 587.5680883505305
Model iJN1463.cmd: 3.933648041373969
Model IMM904.cmd: 0.008677614012166901
Cycle 402
Total biomass:
Model iAF1260.cmd: 588.454289291377
Model iJN1463.cmd: 3.9806961565028294
Model IMM904.cmd: 0.008869011522009357
Cycle 403
Total biomass:
Model iAF1260.cmd: 589.1228750049435
Model iJN1463.cmd: 4.027896633537144
Model IMM904.cmd: 0.009065739832429904
Cycle 404
Total biomass:
Model iAF1260.cmd: 589.9370402099361
Model iJN1463.cmd: 4.0752165839223755
Model IMM904.cmd: 0.009280764450977398
Cycle 405
Total biomass:
Model iAF1260.cmd: 590.7163023403322
Model iJN1463.cmd: 4.122725935209645

Model IMM904.cmd: 0.009522318946383347
Cycle 406
Total biomass:
Model iAF1260.cmd: 591.6050190171769
Model iJN1463.cmd: 4.170434780849852
Model IMM904.cmd: 0.009751110876727693
Cycle 407
Total biomass:
Model iAF1260.cmd: 592.3127035923769
Model iJN1463.cmd: 4.218286155503929
Model IMM904.cmd: 0.01000515417513192
Cycle 408
Total biomass:
Model iAF1260.cmd: 593.2403757401592
Model iJN1463.cmd: 4.266898441405808
Model IMM904.cmd: 0.010276284903227692
Cycle 409
Total biomass:
Model iAF1260.cmd: 594.118229105608
Model iJN1463.cmd: 4.315110979782161
Model IMM904.cmd: 0.01051722344630447
Cycle 410
Total biomass:
Model iAF1260.cmd: 594.9280705490017
Model iJN1463.cmd: 4.363448126339746
Model IMM904.cmd: 0.010806795732279151
Cycle 411
Total biomass:
Model iAF1260.cmd: 595.6827920230231
Model iJN1463.cmd: 4.411959627437596
Model IMM904.cmd: 0.011113976813560621
Cycle 412
Total biomass:
Model iAF1260.cmd: 596.405986565547
Model iJN1463.cmd: 4.460641475790482
Model IMM904.cmd: 0.011426141345049021
Cycle 413
Total biomass:
Model iAF1260.cmd: 597.203740513099
Model iJN1463.cmd: 4.5095593000917935
Model IMM904.cmd: 0.011755315492971938
Cycle 414
Total biomass:
Model iAF1260.cmd: 598.0228348796273
Model iJN1463.cmd: 4.558598244658198
Model IMM904.cmd: 0.012109850250379004
Cycle 415
Total biomass:
Model iAF1260.cmd: 598.8239091651496
Model iJN1463.cmd: 4.607709615149511
Model IMM904.cmd: 0.012466331056462608
Cycle 416
Total biomass:
Model iAF1260.cmd: 599.6709969083759
Model iJN1463.cmd: 4.656987600212518
Model IMM904.cmd: 0.012840370654771612
Cycle 417
Total biomass:
Model iAF1260.cmd: 600.5215861687177
Model iJN1463.cmd: 4.706426682987259
Model IMM904.cmd: 0.013226147246479554
Cycle 418
Total biomass:
Model iAF1260.cmd: 601.254480771523
Model iJN1463.cmd: 4.757150063672277
Model IMM904.cmd: 0.01359829208312929
Cycle 419
Total biomass:
Model iAF1260.cmd: 602.1260840230091
Model iJN1463.cmd: 4.809164058093848
Model IMM904.cmd: 0.014012791454066984
Cycle 420
Total biomass:
Model iAF1260.cmd: 602.9003730560466
Model iJN1463.cmd: 4.859110050564587
Model IMM904.cmd: 0.014447803594678031
Cycle 421
Total biomass:
Model iAF1260.cmd: 603.7359095023825
Model iJN1463.cmd: 4.909192339254216
Model IMM904.cmd: 0.014886878244220622
Cycle 422
Total biomass:

Model iAF1260.cmd: 604.6907129474326
Model iJN1463.cmd: 4.959451180209305
Model IMM904.cmd: 0.015322995086223116
Cycle 423
Total biomass:
Model iAF1260.cmd: 605.4845609001615
Model iJN1463.cmd: 5.009895498998086
Model IMM904.cmd: 0.015773524180762742
Cycle 424
Total biomass:
Model iAF1260.cmd: 606.3254937497051
Model iJN1463.cmd: 5.061054726503542
Model IMM904.cmd: 0.016281686330351156
Cycle 425
Total biomass:
Model iAF1260.cmd: 607.0757369041628
Model iJN1463.cmd: 5.111697334362724
Model IMM904.cmd: 0.016753700312969022
Cycle 426
Total biomass:
Model iAF1260.cmd: 607.9269176042222
Model iJN1463.cmd: 5.162466805140881
Model IMM904.cmd: 0.01731597390545051
Cycle 427
Total biomass:
Model iAF1260.cmd: 608.7745007594259
Model iJN1463.cmd: 5.213384418774957
Model IMM904.cmd: 0.017887789577789047
Cycle 428
Total biomass:
Model iAF1260.cmd: 609.6254129631401
Model iJN1463.cmd: 5.264489925850887
Model IMM904.cmd: 0.018466158760725878
Cycle 429
Total biomass:
Model iAF1260.cmd: 610.5309465776568
Model iJN1463.cmd: 5.315721444806677
Model IMM904.cmd: 0.019063607120116833
Cycle 430
Total biomass:
Model iAF1260.cmd: 611.2725359561603
Model iJN1463.cmd: 5.367124520517578
Model IMM904.cmd: 0.019671208682468945
Cycle 431
Total biomass:
Model iAF1260.cmd: 612.0141580140873
Model iJN1463.cmd: 5.41867293729157
Model IMM904.cmd: 0.02032962532538474
Cycle 432
Total biomass:
Model iAF1260.cmd: 613.0357218204621
Model iJN1463.cmd: 5.472436554936464
Model IMM904.cmd: 0.020994463939648357
Cycle 433
Total biomass:
Model iAF1260.cmd: 613.8288520844428
Model iJN1463.cmd: 5.5250109491119295
Model IMM904.cmd: 0.021647620821660895
Cycle 434
Total biomass:
Model iAF1260.cmd: 614.6419753240012
Model iJN1463.cmd: 5.577109370620085
Model IMM904.cmd: 0.022286886013757515
Cycle 435
Total biomass:
Model iAF1260.cmd: 615.4093068343831
Model iJN1463.cmd: 5.629325055284737
Model IMM904.cmd: 0.02300455159988767
Cycle 436
Total biomass:
Model iAF1260.cmd: 616.385037625989
Model iJN1463.cmd: 5.6816663206736235
Model IMM904.cmd: 0.023695264051706365
Cycle 437
Total biomass:
Model iAF1260.cmd: 617.2680885175071
Model iJN1463.cmd: 5.735037290180205
Model IMM904.cmd: 0.02440683510047591
Cycle 438
Total biomass:
Model iAF1260.cmd: 618.105197475261
Model iJN1463.cmd: 5.787661869028676
Model IMM904.cmd: 0.02517514058765039

Cycle 439
Total biomass:
Model iAF1260.cmd: 619.0681783825978
Model iJN1463.cmd: 5.840436238007605
Model IMM904.cmd: 0.026037657438463587
Cycle 440
Total biomass:
Model iAF1260.cmd: 619.9183007259892
Model iJN1463.cmd: 5.89337605212036
Model IMM904.cmd: 0.026900981611632815
Cycle 441
Total biomass:
Model iAF1260.cmd: 620.7292908466358
Model iJN1463.cmd: 5.946509535261124
Model IMM904.cmd: 0.027794664214613084
Cycle 442
Total biomass:
Model iAF1260.cmd: 621.6893266556183
Model iJN1463.cmd: 5.999757228508922
Model IMM904.cmd: 0.028722487789407905
Cycle 443
Total biomass:
Model iAF1260.cmd: 622.6166669367873
Model iJN1463.cmd: 6.053124994191144
Model IMM904.cmd: 0.02968733654107433
Cycle 444
Total biomass:
Model iAF1260.cmd: 623.4554327097693
Model iJN1463.cmd: 6.106603062209652
Model IMM904.cmd: 0.03069351570666078
Cycle 445
Total biomass:
Model iAF1260.cmd: 624.3153135377256
Model iJN1463.cmd: 6.160204085119934
Model IMM904.cmd: 0.03174087966286212
Cycle 446
Total biomass:
Model iAF1260.cmd: 625.1079253526483
Model iJN1463.cmd: 6.213934338621241
Model IMM904.cmd: 0.03283654533971962
Cycle 447
Total biomass:
Model iAF1260.cmd: 625.9865950700706
Model iJN1463.cmd: 6.267823384811364
Model IMM904.cmd: 0.03383735970464144
Cycle 448
Total biomass:
Model iAF1260.cmd: 626.8256143658435
Model iJN1463.cmd: 6.321874464208391
Model IMM904.cmd: 0.0348666659108517
Cycle 449
Total biomass:
Model iAF1260.cmd: 627.618702328678
Model iJN1463.cmd: 6.376153302967604
Model IMM904.cmd: 0.03592251329473721
Cycle 450
Total biomass:
Model iAF1260.cmd: 628.4449240289148
Model iJN1463.cmd: 6.430494832512069
Model IMM904.cmd: 0.03718707378114457
Cycle 451
Total biomass:
Model iAF1260.cmd: 629.5132353558282
Model iJN1463.cmd: 6.485019689327453
Model IMM904.cmd: 0.03846936636831556
Cycle 452
Total biomass:
Model iAF1260.cmd: 630.3308387299855
Model iJN1463.cmd: 6.539686293045693
Model IMM904.cmd: 0.039787834724641306
Cycle 453
Total biomass:
Model iAF1260.cmd: 631.1188364221149
Model iJN1463.cmd: 6.594545792494708
Model IMM904.cmd: 0.04111400912867729
Cycle 454
Total biomass:
Model iAF1260.cmd: 632.1014179552404
Model iJN1463.cmd: 6.649579474194661
Model IMM904.cmd: 0.042540422617866266
Cycle 455
Total biomass:
Model iAF1260.cmd: 633.084918092392

Model iJN1463.cmd: 6.7047184911237006
Model IMM904.cmd: 0.04383788160374075
Cycle 456
Total biomass:
Model iAF1260.cmd: 633.9839069626022
Model iJN1463.cmd: 6.75995411930478
Model IMM904.cmd: 0.04538181240986482
Cycle 457
Total biomass:
Model iAF1260.cmd: 634.9496204977015
Model iJN1463.cmd: 6.815296729050915
Model IMM904.cmd: 0.046803967058462514
Cycle 458
Total biomass:
Model iAF1260.cmd: 635.8538537911054
Model iJN1463.cmd: 6.870648082195513
Model IMM904.cmd: 0.04824002904257244
Cycle 459
Total biomass:
Model iAF1260.cmd: 636.7152124798655
Model iJN1463.cmd: 6.926040469575728
Model IMM904.cmd: 0.04949945160909174
Cycle 460
Total biomass:
Model iAF1260.cmd: 637.5078079034494
Model iJN1463.cmd: 6.981499404360979
Model IMM904.cmd: 0.05094671568881149
Cycle 461
Total biomass:
Model iAF1260.cmd: 638.3452660266482
Model iJN1463.cmd: 7.037090635337802
Model IMM904.cmd: 0.05251990531038096
Cycle 462
Total biomass:
Model iAF1260.cmd: 639.2955685336998
Model iJN1463.cmd: 7.092736022939242
Model IMM904.cmd: 0.053927043599329115
Cycle 463
Total biomass:
Model iAF1260.cmd: 640.177519361738
Model iJN1463.cmd: 7.148465873470003
Model IMM904.cmd: 0.055493640609695416
Cycle 464
Total biomass:
Model iAF1260.cmd: 641.1880875793382
Model iJN1463.cmd: 7.204274139406004
Model IMM904.cmd: 0.05732282320359635
Cycle 465
Total biomass:
Model iAF1260.cmd: 642.1167743874153
Model iJN1463.cmd: 7.2601657115117755
Model IMM904.cmd: 0.05908186936263221
Cycle 466
Total biomass:
Model iAF1260.cmd: 642.9095850216598
Model iJN1463.cmd: 7.316169227313884
Model IMM904.cmd: 0.06094566622267098
Cycle 467
Total biomass:
Model iAF1260.cmd: 643.6753024222844
Model iJN1463.cmd: 7.3722937198531415
Model IMM904.cmd: 0.06294050639764777
Cycle 468
Total biomass:
Model iAF1260.cmd: 644.5849013806618
Model iJN1463.cmd: 7.428523470574869
Model IMM904.cmd: 0.06520625610434502
Cycle 469
Total biomass:
Model iAF1260.cmd: 645.4538863333997
Model iJN1463.cmd: 7.484867022260671
Model IMM904.cmd: 0.06772185605469927
Cycle 470
Total biomass:
Model iAF1260.cmd: 646.3851324937921
Model iJN1463.cmd: 7.541318864238606
Model IMM904.cmd: 0.07014593593375153
Cycle 471
Total biomass:
Model iAF1260.cmd: 647.0873417864307
Model iJN1463.cmd: 7.597877220792601
Model IMM904.cmd: 0.0726148592271761
Cycle 472

Total biomass:
Model iAF1260.cmd: 648.1092610432746
Model iJN1463.cmd: 7.654631105039198
Model IMM904.cmd: 0.07519568373389031
Cycle 473
Total biomass:
Model iAF1260.cmd: 648.9615523624286
Model iJN1463.cmd: 7.711460248241544
Model IMM904.cmd: 0.07783749511683412
Cycle 474
Total biomass:
Model iAF1260.cmd: 649.863911592547
Model iJN1463.cmd: 7.768359400030046
Model IMM904.cmd: 0.08037412350407144
Cycle 475
Total biomass:
Model iAF1260.cmd: 650.8170045866996
Model iJN1463.cmd: 7.825301837452538
Model IMM904.cmd: 0.08264790470859316
Cycle 476
Total biomass:
Model iAF1260.cmd: 651.6678323220424
Model iJN1463.cmd: 7.882292678325537
Model IMM904.cmd: 0.08504856577285079
Cycle 477
Total biomass:
Model iAF1260.cmd: 652.4929085693612
Model iJN1463.cmd: 7.939334918390168
Model IMM904.cmd: 0.08768541279175329
Cycle 478
Total biomass:
Model iAF1260.cmd: 653.2683576577149
Model iJN1463.cmd: 7.99642506698233
Model IMM904.cmd: 0.09044819762056423
Cycle 479
Total biomass:
Model iAF1260.cmd: 654.0543555854382
Model iJN1463.cmd: 8.053567012601054
Model IMM904.cmd: 0.09335997764256852
Cycle 480
Total biomass:
Model iAF1260.cmd: 654.8388396521312
Model iJN1463.cmd: 8.11076446547127
Model IMM904.cmd: 0.09679544591078565
Cycle 481
Total biomass:
Model iAF1260.cmd: 655.662644025314
Model iJN1463.cmd: 8.16801825613356
Model IMM904.cmd: 0.09985754690314981
Cycle 482
Total biomass:
Model iAF1260.cmd: 656.6232676593413
Model iJN1463.cmd: 8.225394763219175
Model IMM904.cmd: 0.10279310866105085
Cycle 483
Total biomass:
Model iAF1260.cmd: 657.4744524528905
Model iJN1463.cmd: 8.28288469661327
Model IMM904.cmd: 0.10581549264950142
Cycle 484
Total biomass:
Model iAF1260.cmd: 658.2713610280507
Model iJN1463.cmd: 8.340447714700668
Model IMM904.cmd: 0.10905312281515428
Cycle 485
Total biomass:
Model iAF1260.cmd: 659.0924591313701
Model iJN1463.cmd: 8.398049648965648
Model IMM904.cmd: 0.11300404226906036
Cycle 486
Total biomass:
Model iAF1260.cmd: 659.8465354267927
Model iJN1463.cmd: 8.455792676179724
Model IMM904.cmd: 0.11718947710505062
Cycle 487
Total biomass:
Model iAF1260.cmd: 660.6793495474785
Model iJN1463.cmd: 8.514258876476717
Model IMM904.cmd: 0.12120488015152855
Cycle 488
Total biomass:
Model iAF1260.cmd: 661.6051129467766
Model iJN1463.cmd: 8.572916920031794

Model IMM904.cmd: 0.12495197413684511
Cycle 489
Total biomass:
Model iAF1260.cmd: 662.5517840657166
Model iJN1463.cmd: 8.630799650177622
Model IMM904.cmd: 0.12881196983285711
Cycle 490
Total biomass:
Model iAF1260.cmd: 663.4655005852105
Model iJN1463.cmd: 8.688700856581885
Model IMM904.cmd: 0.1331843291509258
Cycle 491
Total biomass:
Model iAF1260.cmd: 664.296050110368
Model iJN1463.cmd: 8.746620083196477
Model IMM904.cmd: 0.13699860504460015
Cycle 492
Total biomass:
Model iAF1260.cmd: 665.2658779399803
Model iJN1463.cmd: 8.804558362600405
Model IMM904.cmd: 0.1408722360835515
Cycle 493
Total biomass:
Model iAF1260.cmd: 666.139189833138
Model iJN1463.cmd: 8.862521498697475
Model IMM904.cmd: 0.1456842938662944
Cycle 494
Total biomass:
Model iAF1260.cmd: 666.9598592186265
Model iJN1463.cmd: 8.920517587592492
Model IMM904.cmd: 0.1503879320112181
Cycle 495
Total biomass:
Model iAF1260.cmd: 667.8109521120164
Model iJN1463.cmd: 8.978534777385244
Model IMM904.cmd: 0.15522627897548769
Cycle 496
Total biomass:
Model iAF1260.cmd: 668.7973044915168
Model iJN1463.cmd: 9.036573238736516
Model IMM904.cmd: 0.15991498044230182
Cycle 497
Total biomass:
Model iAF1260.cmd: 669.6621302904712
Model iJN1463.cmd: 9.09463358052065
Model IMM904.cmd: 0.16469381993639637
Cycle 498
Total biomass:
Model iAF1260.cmd: 670.5995500911927
Model iJN1463.cmd: 9.1527304843873
Model IMM904.cmd: 0.1697672161515486
Cycle 499
Total biomass:
Model iAF1260.cmd: 671.4557444341787
Model iJN1463.cmd: 9.210848592558966
Model IMM904.cmd: 0.17475214918649226
Cycle 500
Total biomass:
Model iAF1260.cmd: 672.3454304728191
Model iJN1463.cmd: 9.270129674925949
Model IMM904.cmd: 0.18001658521174377
Cycle 501
Total biomass:
Model iAF1260.cmd: 673.2591932296926
Model iJN1463.cmd: 9.3283097725261
Model IMM904.cmd: 0.18511669179788348
Cycle 502
Total biomass:
Model iAF1260.cmd: 674.1257719988315
Model iJN1463.cmd: 9.386524840819845
Model IMM904.cmd: 0.19085149942624247
Cycle 503
Total biomass:
Model iAF1260.cmd: 675.0155453010071
Model iJN1463.cmd: 9.444761543765267
Model IMM904.cmd: 0.19668433626234214
Cycle 504
Total biomass:
Model iAF1260.cmd: 675.9893675372883
Model iJN1463.cmd: 9.5030276242018
Model IMM904.cmd: 0.20240090238828315
Cycle 505
Total biomass:

Model iAF1260.cmd: 676.8777996689274
Model iJN1463.cmd: 9.561339442400167
Model IMM904.cmd: 0.2081032302166085
Cycle 506
Total biomass:
Model iAF1260.cmd: 677.9687787282595
Model iJN1463.cmd: 9.619682977647855
Model IMM904.cmd: 0.2137180413553391
Cycle 507
Total biomass:
Model iAF1260.cmd: 678.8499328454635
Model iJN1463.cmd: 9.678060296052307
Model IMM904.cmd: 0.21939395833630032
Cycle 508
Total biomass:
Model iAF1260.cmd: 679.6692370986157
Model iJN1463.cmd: 9.736469279041502
Model IMM904.cmd: 0.22531832806997304
Cycle 509
Total biomass:
Model iAF1260.cmd: 680.5182329611459
Model iJN1463.cmd: 9.795659127437643
Model IMM904.cmd: 0.23131295268498858
Cycle 510
Total biomass:
Model iAF1260.cmd: 681.4266309185247
Model iJN1463.cmd: 9.854030139680846
Model IMM904.cmd: 0.2369768075728943
Cycle 511
Total biomass:
Model iAF1260.cmd: 682.5145329669291
Model iJN1463.cmd: 9.912379716005733
Model IMM904.cmd: 0.24319305790036858
Cycle 512
Total biomass:
Model iAF1260.cmd: 683.4509440622564
Model iJN1463.cmd: 9.970706474946523
Model IMM904.cmd: 0.24939268894728858
Cycle 513
Total biomass:
Model iAF1260.cmd: 684.3827582626591
Model iJN1463.cmd: 10.029009317268185
Model IMM904.cmd: 0.25543867041805063
Cycle 514
Total biomass:
Model iAF1260.cmd: 685.2967171948027
Model iJN1463.cmd: 10.087287389478897
Model IMM904.cmd: 0.26175596228747466
Cycle 515
Total biomass:
Model iAF1260.cmd: 686.1570202253977
Model iJN1463.cmd: 10.145539279661252
Model IMM904.cmd: 0.2681703345615717
Cycle 516
Total biomass:
Model iAF1260.cmd: 687.019815487119
Model iJN1463.cmd: 10.203765967448351
Model IMM904.cmd: 0.2747552683408724
Cycle 517
Total biomass:
Model iAF1260.cmd: 687.8285222663985
Model iJN1463.cmd: 10.261966040876006
Model IMM904.cmd: 0.28124035986330287
Cycle 518
Total biomass:
Model iAF1260.cmd: 688.7077253686199
Model iJN1463.cmd: 10.320137693320062
Model IMM904.cmd: 0.2876763385996829
Cycle 519
Total biomass:
Model iAF1260.cmd: 689.6600353885519
Model iJN1463.cmd: 10.37828005645545
Model IMM904.cmd: 0.2942313842679377
Cycle 520
Total biomass:
Model iAF1260.cmd: 690.5881007066229
Model iJN1463.cmd: 10.436390902023012
Model IMM904.cmd: 0.30081877907723487
Cycle 521
Total biomass:
Model iAF1260.cmd: 691.5856990079081
Model iJN1463.cmd: 10.494467210299439
Model IMM904.cmd: 0.30767953952816784

Cycle 522
Total biomass:
Model iAF1260.cmd: 692.6582936377209
Model iJN1463.cmd: 10.552507031356548
Model IMM904.cmd: 0.31458168923802055
Cycle 523
Total biomass:
Model iAF1260.cmd: 693.4545149812915
Model iJN1463.cmd: 10.61050967763617
Model IMM904.cmd: 0.3215751229562932
Cycle 524
Total biomass:
Model iAF1260.cmd: 694.3197384948918
Model iJN1463.cmd: 10.66847488583125
Model IMM904.cmd: 0.32838902425325245
Cycle 525
Total biomass:
Model iAF1260.cmd: 695.1277606741156
Model iJN1463.cmd: 10.726401719577348
Model IMM904.cmd: 0.33541597207989887
Cycle 526
Total biomass:
Model iAF1260.cmd: 696.1903627983835
Model iJN1463.cmd: 10.784287616254854
Model IMM904.cmd: 0.34256223746474346
Cycle 527
Total biomass:
Model iAF1260.cmd: 697.1831755211624
Model iJN1463.cmd: 10.842133285708265
Model IMM904.cmd: 0.34975362099096535
Cycle 528
Total biomass:
Model iAF1260.cmd: 698.2020482607958
Model iJN1463.cmd: 10.899934735959668
Model IMM904.cmd: 0.35700158576692553
Cycle 529
Total biomass:
Model iAF1260.cmd: 699.029954650736
Model iJN1463.cmd: 10.957694060944627
Model IMM904.cmd: 0.3640968915191339
Cycle 530
Total biomass:
Model iAF1260.cmd: 699.9423125269171
Model iJN1463.cmd: 11.015409195440391
Model IMM904.cmd: 0.3713806501870942
Cycle 531
Total biomass:
Model iAF1260.cmd: 700.8284005122014
Model iJN1463.cmd: 11.073076393910682
Model IMM904.cmd: 0.37889256627585927
Cycle 532
Total biomass:
Model iAF1260.cmd: 701.6255466332142
Model iJN1463.cmd: 11.1307078674935
Model IMM904.cmd: 0.38653479429997867
Cycle 533
Total biomass:
Model iAF1260.cmd: 702.5855538063664
Model iJN1463.cmd: 11.188323323736157
Model IMM904.cmd: 0.3940199945552359
Cycle 534
Total biomass:
Model iAF1260.cmd: 703.3764367070819
Model iJN1463.cmd: 11.2459215305803
Model IMM904.cmd: 0.4017768992604735
Cycle 535
Total biomass:
Model iAF1260.cmd: 704.3251706683837
Model iJN1463.cmd: 11.304294606985176
Model IMM904.cmd: 0.4094927714475462
Cycle 536
Total biomass:
Model iAF1260.cmd: 705.2569972653155
Model iJN1463.cmd: 11.36185457277679
Model IMM904.cmd: 0.4172278950359127
Cycle 537
Total biomass:
Model iAF1260.cmd: 706.2631928392054
Model iJN1463.cmd: 11.41939027503869
Model IMM904.cmd: 0.4247921400277633
Cycle 538
Total biomass:
Model iAF1260.cmd: 707.2990451550326

Model iJN1463.cmd: 11.476903280320709
Model IMM904.cmd: 0.43265460419812335
Cycle 539
Total biomass:
Model iAF1260.cmd: 708.2159968806743
Model iJN1463.cmd: 11.534392656195216
Model IMM904.cmd: 0.4405063108279941
Cycle 540
Total biomass:
Model iAF1260.cmd: 709.3017836013518
Model iJN1463.cmd: 11.591858513429113
Model IMM904.cmd: 0.4483986483017946
Cycle 541
Total biomass:
Model iAF1260.cmd: 710.2255054680742
Model iJN1463.cmd: 11.649298765472846
Model IMM904.cmd: 0.45615622275436074
Cycle 542
Total biomass:
Model iAF1260.cmd: 711.1052072785352
Model iJN1463.cmd: 11.70671292883623
Model IMM904.cmd: 0.46384022005231385
Cycle 543
Total biomass:
Model iAF1260.cmd: 712.2053270067012
Model iJN1463.cmd: 11.764098682946248
Model IMM904.cmd: 0.47164444187760685
Cycle 544
Total biomass:
Model iAF1260.cmd: 713.2100314838141
Model iJN1463.cmd: 11.82145621351005
Model IMM904.cmd: 0.47958600453064887
Cycle 545
Total biomass:
Model iAF1260.cmd: 714.0311366658525
Model iJN1463.cmd: 11.87878217987651
Model IMM904.cmd: 0.4875543732459059
Cycle 546
Total biomass:
Model iAF1260.cmd: 715.1219624422586
Model iJN1463.cmd: 11.936074717852316
Model IMM904.cmd: 0.4956922349309579
Cycle 547
Total biomass:
Model iAF1260.cmd: 716.01226783156
Model iJN1463.cmd: 11.993329071845473
Model IMM904.cmd: 0.5039182914333012
Cycle 548
Total biomass:
Model iAF1260.cmd: 717.0346449311643
Model iJN1463.cmd: 12.05054226314583
Model IMM904.cmd: 0.5120133561174138
Cycle 549
Total biomass:
Model iAF1260.cmd: 717.8683569285618
Model iJN1463.cmd: 12.107717427076105
Model IMM904.cmd: 0.520169149742354
Cycle 550
Total biomass:
Model iAF1260.cmd: 718.6404112051438
Model iJN1463.cmd: 12.164851825292576
Model IMM904.cmd: 0.528255565748883
Cycle 551
Total biomass:
Model iAF1260.cmd: 719.5365710279776
Model iJN1463.cmd: 12.221943782338895
Model IMM904.cmd: 0.5364033996931931
Cycle 552
Total biomass:
Model iAF1260.cmd: 720.4205837158739
Model iJN1463.cmd: 12.278988797295485
Model IMM904.cmd: 0.5445363597271781
Cycle 553
Total biomass:
Model iAF1260.cmd: 721.3496577971998
Model iJN1463.cmd: 12.335988094658424
Model IMM904.cmd: 0.5527491805127801
Cycle 554
Total biomass:
Model iAF1260.cmd: 722.4460386723238
Model iJN1463.cmd: 12.394498500964726
Model IMM904.cmd: 0.5609928215857642
Cycle 555

Total biomass:
Model iAF1260.cmd: 723.5233994999295
Model iJN1463.cmd: 12.45218491894725
Model IMM904.cmd: 0.56938674314635
Cycle 556
Total biomass:
Model iAF1260.cmd: 724.4025736377175
Model iJN1463.cmd: 12.511339066281975
Model IMM904.cmd: 0.577793598146982
Cycle 557
Total biomass:
Model iAF1260.cmd: 725.3707423281104
Model iJN1463.cmd: 12.568148225847763
Model IMM904.cmd: 0.5861910749185449
Cycle 558
Total biomass:
Model iAF1260.cmd: 726.4362084897043
Model iJN1463.cmd: 12.626534913639347
Model IMM904.cmd: 0.5945813153759045
Cycle 559
Total biomass:
Model iAF1260.cmd: 727.347046313537
Model iJN1463.cmd: 12.683301347893153
Model IMM904.cmd: 0.6030160803076134
Cycle 560
Total biomass:
Model iAF1260.cmd: 728.4227531943636
Model iJN1463.cmd: 12.740844860134926
Model IMM904.cmd: 0.6114733879461101
Cycle 561
Total biomass:
Model iAF1260.cmd: 729.3599044687098
Model iJN1463.cmd: 12.797563047462853
Model IMM904.cmd: 0.61994317185901
Cycle 562
Total biomass:
Model iAF1260.cmd: 730.2579116571048
Model iJN1463.cmd: 12.856636976286893
Model IMM904.cmd: 0.628375322238998
Cycle 563
Total biomass:
Model iAF1260.cmd: 731.3554228696626
Model iJN1463.cmd: 12.913303338824752
Model IMM904.cmd: 0.6368316594442804
Cycle 564
Total biomass:
Model iAF1260.cmd: 732.4166745418453
Model iJN1463.cmd: 12.969940829595608
Model IMM904.cmd: 0.6452908303051862
Cycle 565
Total biomass:
Model iAF1260.cmd: 733.5480280011317
Model iJN1463.cmd: 13.027355831545968
Model IMM904.cmd: 0.6538179925932159
Cycle 566
Total biomass:
Model iAF1260.cmd: 734.5457312935029
Model iJN1463.cmd: 13.087102755434156
Model IMM904.cmd: 0.6623755875047751
Cycle 567
Total biomass:
Model iAF1260.cmd: 735.6026131362842
Model iJN1463.cmd: 13.14364335052665
Model IMM904.cmd: 0.6709690216581583
Cycle 568
Total biomass:
Model iAF1260.cmd: 736.6654155513272
Model iJN1463.cmd: 13.200149980957054
Model IMM904.cmd: 0.6796574787932137
Cycle 569
Total biomass:
Model iAF1260.cmd: 737.7094357235552
Model iJN1463.cmd: 13.257423340710929
Model IMM904.cmd: 0.6882726394659082
Cycle 570
Total biomass:
Model iAF1260.cmd: 738.724103991711
Model iJN1463.cmd: 13.313856891781322
Model IMM904.cmd: 0.697003504818309
Cycle 571
Total biomass:
Model iAF1260.cmd: 739.5787018423318
Model iJN1463.cmd: 13.371852785552072

Model IMM904.cmd: 0.7057580961935521
Cycle 572
Total biomass:
Model iAF1260.cmd: 740.5920746322009
Model iJN1463.cmd: 13.42820659051754
Model IMM904.cmd: 0.7145925419479184
Cycle 573
Total biomass:
Model iAF1260.cmd: 741.585301577276
Model iJN1463.cmd: 13.484515146223021
Model IMM904.cmd: 0.7234158672417027
Cycle 574
Total biomass:
Model iAF1260.cmd: 742.6459418307105
Model iJN1463.cmd: 13.540773834191608
Model IMM904.cmd: 0.7322828393938628
Cycle 575
Total biomass:
Model iAF1260.cmd: 743.8344009879115
Model iJN1463.cmd: 13.596985126248962
Model IMM904.cmd: 0.7411760700842704
Cycle 576
Total biomass:
Model iAF1260.cmd: 744.7263887966932
Model iJN1463.cmd: 13.65395157357534
Model IMM904.cmd: 0.7500321118181335
Cycle 577
Total biomass:
Model iAF1260.cmd: 745.8709185726335
Model iJN1463.cmd: 13.717343515110365
Model IMM904.cmd: 0.7587743647631547
Cycle 578
Total biomass:
Model iAF1260.cmd: 747.0893006815129
Model iJN1463.cmd: 13.777258449036395
Model IMM904.cmd: 0.7675266803850647
Cycle 579
Total biomass:
Model iAF1260.cmd: 748.0625835458603
Model iJN1463.cmd: 13.837492099690044
Model IMM904.cmd: 0.7763864019067112
Cycle 580
Total biomass:
Model iAF1260.cmd: 749.1664246461323
Model iJN1463.cmd: 13.900841832508808
Model IMM904.cmd: 0.7852778657809696
Cycle 581
Total biomass:
Model iAF1260.cmd: 750.1001826411805
Model iJN1463.cmd: 13.961644514841597
Model IMM904.cmd: 0.794167550914355
Cycle 582
Total biomass:
Model iAF1260.cmd: 751.1091124769649
Model iJN1463.cmd: 14.024881060260462
Model IMM904.cmd: 0.8030201041730972
Cycle 583
Total biomass:
Model iAF1260.cmd: 752.2227627264893
Model iJN1463.cmd: 14.085648604725996
Model IMM904.cmd: 0.8119507303676529
Cycle 584
Total biomass:
Model iAF1260.cmd: 753.0901684708955
Model iJN1463.cmd: 14.14155767963741
Model IMM904.cmd: 0.8210252576876932
Cycle 585
Total biomass:
Model iAF1260.cmd: 753.9666006706966
Model iJN1463.cmd: 14.19988002454761
Model IMM904.cmd: 0.8301212573607462
Cycle 586
Total biomass:
Model iAF1260.cmd: 754.9562776437011
Model iJN1463.cmd: 14.255719781931875
Model IMM904.cmd: 0.8391452615211449
Cycle 587
Total biomass:
Model iAF1260.cmd: 755.8920269982648
Model iJN1463.cmd: 14.311531548482307
Model IMM904.cmd: 0.848078360249414
Cycle 588
Total biomass:

Model iAF1260.cmd: 756.8091562174783
Model iJN1463.cmd: 14.370495771734443
Model IMM904.cmd: 0.8570852527879322
Cycle 589
Total biomass:
Model iAF1260.cmd: 757.7885249345688
Model iJN1463.cmd: 14.426248385309746
Model IMM904.cmd: 0.8661335322546028
Cycle 590
Total biomass:
Model iAF1260.cmd: 759.0187898545639
Model iJN1463.cmd: 14.481969044069212
Model IMM904.cmd: 0.8751898837026825
Cycle 591
Total biomass:
Model iAF1260.cmd: 760.0181100991651
Model iJN1463.cmd: 14.537656606514396
Model IMM904.cmd: 0.8842541863372138
Cycle 592
Total biomass:
Model iAF1260.cmd: 761.0526760636145
Model iJN1463.cmd: 14.593309596579116
Model IMM904.cmd: 0.8933617081244526
Cycle 593
Total biomass:
Model iAF1260.cmd: 761.9935026694619
Model iJN1463.cmd: 14.648925197653272
Model IMM904.cmd: 0.9024884796235287
Cycle 594
Total biomass:
Model iAF1260.cmd: 763.1230135868284
Model iJN1463.cmd: 14.704502720474832
Model IMM904.cmd: 0.9116595443759997
Cycle 595
Total biomass:
Model iAF1260.cmd: 764.078933292039
Model iJN1463.cmd: 14.760038096977889
Model IMM904.cmd: 0.9210241459590166
Cycle 596
Total biomass:
Model iAF1260.cmd: 765.1282562679601
Model iJN1463.cmd: 14.815527645043664
Model IMM904.cmd: 0.9302551164669332
Cycle 597
Total biomass:
Model iAF1260.cmd: 766.0727093699538
Model iJN1463.cmd: 14.870970358721076
Model IMM904.cmd: 0.9394226517185216
Cycle 598
Total biomass:
Model iAF1260.cmd: 767.0153734476253
Model iJN1463.cmd: 14.9263677340626
Model IMM904.cmd: 0.94866725273697
Cycle 599
Total biomass:
Model iAF1260.cmd: 768.1129989785776
Model iJN1463.cmd: 14.981718971429887
Model IMM904.cmd: 0.9579637714309268
Cycle 600
Total biomass:
Model iAF1260.cmd: 769.1913950950817
Model iJN1463.cmd: 15.037020312678782
Model IMM904.cmd: 0.9672744113620902
Cycle 601
Total biomass:
Model iAF1260.cmd: 770.2822416073949
Model iJN1463.cmd: 15.092271457333732
Model IMM904.cmd: 0.9766598769953235
Cycle 602
Total biomass:
Model iAF1260.cmd: 771.3681263437185
Model iJN1463.cmd: 15.147468067404102
Model IMM904.cmd: 0.9859953472034055
Cycle 603
Total biomass:
Model iAF1260.cmd: 772.4342391579836
Model iJN1463.cmd: 15.202636342899075
Model IMM904.cmd: 0.995363024246129
Cycle 604
Total biomass:
Model iAF1260.cmd: 773.4313390424554
Model iJN1463.cmd: 15.257780278591735
Model IMM904.cmd: 1.004764656239511

Cycle 605
Total biomass:
Model iAF1260.cmd: 774.6964533712056
Model iJN1463.cmd: 15.313707818440328
Model IMM904.cmd: 1.0141870539944091
Cycle 606
Total biomass:
Model iAF1260.cmd: 775.7496023766626
Model iJN1463.cmd: 15.36880725326206
Model IMM904.cmd: 1.0236542176053536
Cycle 607
Total biomass:
Model iAF1260.cmd: 776.6727037665386
Model iJN1463.cmd: 15.423881087277204
Model IMM904.cmd: 1.0332587247851464
Cycle 608
Total biomass:
Model iAF1260.cmd: 777.6925043327334
Model iJN1463.cmd: 15.478929674904236
Model IMM904.cmd: 1.04279420226007
Cycle 609
Total biomass:
Model iAF1260.cmd: 778.7564237997477
Model iJN1463.cmd: 15.533951161810261
Model IMM904.cmd: 1.0523255376329792
Cycle 610
Total biomass:
Model iAF1260.cmd: 779.716202084059
Model iJN1463.cmd: 15.588936933734727
Model IMM904.cmd: 1.0618656909130284
Cycle 611
Total biomass:
Model iAF1260.cmd: 780.6901647691689
Model iJN1463.cmd: 15.643891456133584
Model IMM904.cmd: 1.0714824955180862
Cycle 612
Total biomass:
Model iAF1260.cmd: 781.7496480168378
Model iJN1463.cmd: 15.698812115338745
Model IMM904.cmd: 1.0811436128061136
Cycle 613
Total biomass:
Model iAF1260.cmd: 782.8981136267967
Model iJN1463.cmd: 15.75369904485142
Model IMM904.cmd: 1.0907988492465175
Cycle 614
Total biomass:
Model iAF1260.cmd: 784.0382311141037
Model iJN1463.cmd: 15.808548517485955
Model IMM904.cmd: 1.1005499127902036
Cycle 615
Total biomass:
Model iAF1260.cmd: 785.0478340318432
Model iJN1463.cmd: 15.863358303018508
Model IMM904.cmd: 1.1103743048583643
Cycle 616
Total biomass:
Model iAF1260.cmd: 786.1713178483064
Model iJN1463.cmd: 15.918129408640118
Model IMM904.cmd: 1.120073424207118
Cycle 617
Total biomass:
Model iAF1260.cmd: 787.3247957141972
Model iJN1463.cmd: 15.972859894108392
Model IMM904.cmd: 1.1299554460770092
Cycle 618
Total biomass:
Model iAF1260.cmd: 788.4212664482436
Model iJN1463.cmd: 16.02754795436567
Model IMM904.cmd: 1.1397638776226908
Cycle 619
Total biomass:
Model iAF1260.cmd: 789.3347066394916
Model iJN1463.cmd: 16.08219129197521
Model IMM904.cmd: 1.1497587695336626
Cycle 620
Total biomass:
Model iAF1260.cmd: 790.4544611733652
Model iJN1463.cmd: 16.13678499669232
Model IMM904.cmd: 1.1596631350140778
Cycle 621
Total biomass:
Model iAF1260.cmd: 791.6237766484893

Model iJN1463.cmd: 16.192921256477057
Model IMM904.cmd: 1.1695247036438308
Cycle 622
Total biomass:
Model iAF1260.cmd: 792.7265895539318
Model iJN1463.cmd: 16.2474014887377
Model IMM904.cmd: 1.1794868501200095
Cycle 623
Total biomass:
Model iAF1260.cmd: 793.7054527260221
Model iJN1463.cmd: 16.30263284271779
Model IMM904.cmd: 1.1895461651276111
Cycle 624
Total biomass:
Model iAF1260.cmd: 794.8820347496144
Model iJN1463.cmd: 16.357022633948034
Model IMM904.cmd: 1.1996612909543598
Cycle 625
Total biomass:
Model iAF1260.cmd: 795.8171370937416
Model iJN1463.cmd: 16.41139049734492
Model IMM904.cmd: 1.209791128472313
Cycle 626
Total biomass:
Model iAF1260.cmd: 796.6676305454757
Model iJN1463.cmd: 16.46654491660653
Model IMM904.cmd: 1.219974378654174
Cycle 627
Total biomass:
Model iAF1260.cmd: 797.6257135780281
Model iJN1463.cmd: 16.52633572790723
Model IMM904.cmd: 1.2300399915438205
Cycle 628
Total biomass:
Model iAF1260.cmd: 798.6773704471146
Model iJN1463.cmd: 16.58222443334549
Model IMM904.cmd: 1.2401839691324765
Cycle 629
Total biomass:
Model iAF1260.cmd: 799.7440083672325
Model iJN1463.cmd: 16.636494858933453
Model IMM904.cmd: 1.2502605898489858
Cycle 630
Total biomass:
Model iAF1260.cmd: 800.7542489019963
Model iJN1463.cmd: 16.69073979180532
Model IMM904.cmd: 1.2604235218420496
Cycle 631
Total biomass:
Model iAF1260.cmd: 801.7842327211137
Model iJN1463.cmd: 16.745759101000896
Model IMM904.cmd: 1.2707191410134435
Cycle 632
Total biomass:
Model iAF1260.cmd: 802.8840067719052
Model iJN1463.cmd: 16.799942397321473
Model IMM904.cmd: 1.280880027342017
Cycle 633
Total biomass:
Model iAF1260.cmd: 803.9503096938361
Model iJN1463.cmd: 16.85409315555408
Model IMM904.cmd: 1.2911208333720796
Cycle 634
Total biomass:
Model iAF1260.cmd: 805.2026573734512
Model iJN1463.cmd: 16.911589709033645
Model IMM904.cmd: 1.3013017442676145
Cycle 635
Total biomass:
Model iAF1260.cmd: 806.2937735597404
Model iJN1463.cmd: 16.965672069490484
Model IMM904.cmd: 1.3115194882579226
Cycle 636
Total biomass:
Model iAF1260.cmd: 807.452327354684
Model iJN1463.cmd: 17.019719057354823
Model IMM904.cmd: 1.3218341139041658
Cycle 637
Total biomass:
Model iAF1260.cmd: 808.5139152832207
Model iJN1463.cmd: 17.07453705418101
Model IMM904.cmd: 1.3322693464605617
Cycle 638

Total biomass:
Model iAF1260.cmd: 809.6678923824293
Model iJN1463.cmd: 17.128508753610898
Model IMM904.cmd: 1.3428133562260525
Cycle 639
Total biomass:
Model iAF1260.cmd: 810.684317445289
Model iJN1463.cmd: 17.185598346984463
Model IMM904.cmd: 1.3534782304768425
Cycle 640
Total biomass:
Model iAF1260.cmd: 811.6954481409649
Model iJN1463.cmd: 17.239464172605032
Model IMM904.cmd: 1.3639498949956472
Cycle 641
Total biomass:
Model iAF1260.cmd: 812.8292791312916
Model iJN1463.cmd: 17.294869874687894
Model IMM904.cmd: 1.374390377600248
Cycle 642
Total biomass:
Model iAF1260.cmd: 813.8350672798508
Model iJN1463.cmd: 17.34942616860881
Model IMM904.cmd: 1.384919437022485
Cycle 643
Total biomass:
Model iAF1260.cmd: 815.0816756810633
Model iJN1463.cmd: 17.403933634659005
Model IMM904.cmd: 1.395476830211473
Cycle 644
Total biomass:
Model iAF1260.cmd: 816.1529630925909
Model iJN1463.cmd: 17.45838764078784
Model IMM904.cmd: 1.4060542011065573
Cycle 645
Total biomass:
Model iAF1260.cmd: 817.3899362358394
Model iJN1463.cmd: 17.511995614536623
Model IMM904.cmd: 1.4166245653308511
Cycle 646
Total biomass:
Model iAF1260.cmd: 818.3355904160902
Model iJN1463.cmd: 17.56639668643415
Model IMM904.cmd: 1.4272808992870885
Cycle 647
Total biomass:
Model iAF1260.cmd: 819.3786275690234
Model iJN1463.cmd: 17.61996031417604
Model IMM904.cmd: 1.4379764624360039
Cycle 648
Total biomass:
Model iAF1260.cmd: 820.3600682283162
Model iJN1463.cmd: 17.6735019602544
Model IMM904.cmd: 1.4486697420452554
Cycle 649
Total biomass:
Model iAF1260.cmd: 821.5436369037473
Model iJN1463.cmd: 17.72702237142898
Model IMM904.cmd: 1.4594178200460297
Cycle 650
Total biomass:
Model iAF1260.cmd: 822.8413150206827
Model iJN1463.cmd: 17.781324295660916
Model IMM904.cmd: 1.4701018473894754
Cycle 651
Total biomass:
Model iAF1260.cmd: 823.9481979388918
Model iJN1463.cmd: 17.835551171099407
Model IMM904.cmd: 1.480858051763434
Cycle 652
Total biomass:
Model iAF1260.cmd: 825.071790309044
Model iJN1463.cmd: 17.88899239810812
Model IMM904.cmd: 1.4916652315383923
Cycle 653
Total biomass:
Model iAF1260.cmd: 826.2318310059336
Model iJN1463.cmd: 17.942403694514784
Model IMM904.cmd: 1.5024148640143535
Cycle 654
Total biomass:
Model iAF1260.cmd: 827.3443119564049
Model iJN1463.cmd: 17.995783787262678

Model IMM904.cmd: 1.5132094176466626
Cycle 655
Total biomass:
Model iAF1260.cmd: 828.5171628885419
Model iJN1463.cmd: 18.052342308506276
Model IMM904.cmd: 1.5240150185486807
Cycle 656
Total biomass:
Model iAF1260.cmd: 829.6811476036643
Model iJN1463.cmd: 18.107269514179745
Model IMM904.cmd: 1.5348137449068324
Cycle 657
Total biomass:
Model iAF1260.cmd: 830.8438295592717
Model iJN1463.cmd: 18.160547933088402
Model IMM904.cmd: 1.5457284470608588
Cycle 658
Total biomass:
Model iAF1260.cmd: 832.0833033519378
Model iJN1463.cmd: 18.214596934996425
Model IMM904.cmd: 1.556783332669241
Cycle 659
Total biomass:
Model iAF1260.cmd: 833.3999045641275
Model iJN1463.cmd: 18.267800173540753
Model IMM904.cmd: 1.5677383900247306
Cycle 660
Total biomass:
Model iAF1260.cmd: 834.5303285083994
Model iJN1463.cmd: 18.32096380002747
Model IMM904.cmd: 1.5787702151210785
Cycle 661
Total biomass:
Model iAF1260.cmd: 835.6909098232462
Model iJN1463.cmd: 18.375619676459312
Model IMM904.cmd: 1.5896785676324714
Cycle 662
Total biomass:
Model iAF1260.cmd: 836.7131622778
Model iJN1463.cmd: 18.43201838426763
Model IMM904.cmd: 1.6006763195865497
Cycle 663
Total biomass:
Model iAF1260.cmd: 837.8184112312076
Model iJN1463.cmd: 18.488208419706325
Model IMM904.cmd: 1.6117483742411287
Cycle 664
Total biomass:
Model iAF1260.cmd: 838.9840559618667
Model iJN1463.cmd: 18.54119412192038
Model IMM904.cmd: 1.6227986750111312
Cycle 665
Total biomass:
Model iAF1260.cmd: 840.0907822862248
Model iJN1463.cmd: 18.5941339522191
Model IMM904.cmd: 1.6339289706647273
Cycle 666
Total biomass:
Model iAF1260.cmd: 841.1083622424419
Model iJN1463.cmd: 18.650239062933895
Model IMM904.cmd: 1.6450273165110856
Cycle 667
Total biomass:
Model iAF1260.cmd: 842.193801085437
Model iJN1463.cmd: 18.704690938430456
Model IMM904.cmd: 1.6561384596947193
Cycle 668
Total biomass:
Model iAF1260.cmd: 843.444222233886
Model iJN1463.cmd: 18.757509323793947
Model IMM904.cmd: 1.6671491491721706
Cycle 669
Total biomass:
Model iAF1260.cmd: 844.5491396722559
Model iJN1463.cmd: 18.810310578758607
Model IMM904.cmd: 1.6783524625403807
Cycle 670
Total biomass:
Model iAF1260.cmd: 845.8482722180031
Model iJN1463.cmd: 18.866619614232025
Model IMM904.cmd: 1.6896051545711497
Cycle 671
Total biomass:

Model iAF1260.cmd: 847.1388803369929
Model iJN1463.cmd: 18.919379828642636
Model IMM904.cmd: 1.7009451807528455
Cycle 672
Total biomass:
Model iAF1260.cmd: 848.2824128412198
Model iJN1463.cmd: 18.97211994319417
Model IMM904.cmd: 1.7122367582082918
Cycle 673
Total biomass:
Model iAF1260.cmd: 849.4374639646352
Model iJN1463.cmd: 19.024838962967056
Model IMM904.cmd: 1.7235958114885144
Cycle 674
Total biomass:
Model iAF1260.cmd: 850.6320042696516
Model iJN1463.cmd: 19.077533591621993
Model IMM904.cmd: 1.7350296647803225
Cycle 675
Total biomass:
Model iAF1260.cmd: 851.8606206624198
Model iJN1463.cmd: 19.130202312422924
Model IMM904.cmd: 1.7464692999774623
Cycle 676
Total biomass:
Model iAF1260.cmd: 853.0703476464671
Model iJN1463.cmd: 19.18284416589032
Model IMM904.cmd: 1.7579688056315468
Cycle 677
Total biomass:
Model iAF1260.cmd: 854.2366445232161
Model iJN1463.cmd: 19.23545723016202
Model IMM904.cmd: 1.7695247378373695
Cycle 678
Total biomass:
Model iAF1260.cmd: 855.2205257734383
Model iJN1463.cmd: 19.288037869442228
Model IMM904.cmd: 1.7810884508895013
Cycle 679
Total biomass:
Model iAF1260.cmd: 856.1959005382599
Model iJN1463.cmd: 19.341396914106507
Model IMM904.cmd: 1.7926394334524054
Cycle 680
Total biomass:
Model iAF1260.cmd: 857.0179323352493
Model iJN1463.cmd: 19.39391216100515
Model IMM904.cmd: 1.804091170330601
Cycle 681
Total biomass:
Model iAF1260.cmd: 857.9672125499552
Model iJN1463.cmd: 19.44639216549978
Model IMM904.cmd: 1.815594727295314
Cycle 682
Total biomass:
Model iAF1260.cmd: 858.8986645154638
Model iJN1463.cmd: 19.49964421434712
Model IMM904.cmd: 1.8271365647632123
Cycle 683
Total biomass:
Model iAF1260.cmd: 859.9182198070105
Model iJN1463.cmd: 19.55204656605511
Model IMM904.cmd: 1.8386760502568265
Cycle 684
Total biomass:
Model iAF1260.cmd: 860.9365285852036
Model iJN1463.cmd: 19.6044083953858
Model IMM904.cmd: 1.850283747825406
Cycle 685
Total biomass:
Model iAF1260.cmd: 861.8978601952684
Model iJN1463.cmd: 19.65672817744614
Model IMM904.cmd: 1.8618842256801078
Cycle 686
Total biomass:
Model iAF1260.cmd: 862.9237237313893
Model iJN1463.cmd: 19.709820675554198
Model IMM904.cmd: 1.873420987135927
Cycle 687
Total biomass:
Model iAF1260.cmd: 863.9164471881326
Model iJN1463.cmd: 19.762865677193588
Model IMM904.cmd: 1.8849612598448746

Cycle 688
Total biomass:
Model iAF1260.cmd: 864.8355842641588
Model iJN1463.cmd: 19.815599931954225
Model IMM904.cmd: 1.8966300295260903
Cycle 689
Total biomass:
Model iAF1260.cmd: 865.7945805066796
Model iJN1463.cmd: 19.867746968743585
Model IMM904.cmd: 1.9082849811615792
Cycle 690
Total biomass:
Model iAF1260.cmd: 866.6607676278279
Model iJN1463.cmd: 19.920064434947182
Model IMM904.cmd: 1.9201562834769355
Cycle 691
Total biomass:
Model iAF1260.cmd: 867.5220588536505
Model iJN1463.cmd: 19.97211335971107
Model IMM904.cmd: 1.9321119879261521
Cycle 692
Total biomass:
Model iAF1260.cmd: 868.4110296930982
Model iJN1463.cmd: 20.024124510660517
Model IMM904.cmd: 1.9440415956114174
Cycle 693
Total biomass:
Model iAF1260.cmd: 869.4133661877818
Model iJN1463.cmd: 20.076114905761447
Model IMM904.cmd: 1.9559138061873214
Cycle 694
Total biomass:
Model iAF1260.cmd: 870.3767840954101
Model iJN1463.cmd: 20.12808503876076
Model IMM904.cmd: 1.9677730331005652
Cycle 695
Total biomass:
Model iAF1260.cmd: 871.357028693349
Model iJN1463.cmd: 20.180033697735542
Model IMM904.cmd: 1.9797256129492289
Cycle 696
Total biomass:
Model iAF1260.cmd: 872.3893337230068
Model iJN1463.cmd: 20.2319626299342
Model IMM904.cmd: 1.9917349042216586
Cycle 697
Total biomass:
Model iAF1260.cmd: 873.2713936483806
Model iJN1463.cmd: 20.284680201233115
Model IMM904.cmd: 2.0038200959914567
Cycle 698
Total biomass:
Model iAF1260.cmd: 874.268938315137
Model iJN1463.cmd: 20.336562029080465
Model IMM904.cmd: 2.0159483661838142
Cycle 699
Total biomass:
Model iAF1260.cmd: 875.248817264689
Model iJN1463.cmd: 20.39314781036975
Model IMM904.cmd: 2.0280786311287615
Cycle 700
Total biomass:
Model iAF1260.cmd: 876.1846698300448
Model iJN1463.cmd: 20.445786360283815
Model IMM904.cmd: 2.040244923531598
Cycle 701
Total biomass:
Model iAF1260.cmd: 877.2569798385797
Model iJN1463.cmd: 20.497588588412228
Model IMM904.cmd: 2.0525022194154565
Cycle 702
Total biomass:
Model iAF1260.cmd: 878.2150658243737
Model iJN1463.cmd: 20.549355703303355
Model IMM904.cmd: 2.064675532584695
Cycle 703
Total biomass:
Model iAF1260.cmd: 879.1494914435027
Model iJN1463.cmd: 20.60108512415261
Model IMM904.cmd: 2.076834553811142
Cycle 704
Total biomass:
Model iAF1260.cmd: 880.0439881601153

Model iJN1463.cmd: 20.65277423170838
Model IMM904.cmd: 2.089050723569555
Cycle 705
Total biomass:
Model iAF1260.cmd: 880.9801546772808
Model iJN1463.cmd: 20.70523976959558
Model IMM904.cmd: 2.101195744795882
Cycle 706
Total biomass:
Model iAF1260.cmd: 881.87363453549
Model iJN1463.cmd: 20.75685381754792
Model IMM904.cmd: 2.113440366602978
Cycle 707
Total biomass:
Model iAF1260.cmd: 882.824785429399
Model iJN1463.cmd: 20.80842514499758
Model IMM904.cmd: 2.125646458243325
Cycle 708
Total biomass:
Model iAF1260.cmd: 883.8302304588855
Model iJN1463.cmd: 20.859953941488598
Model IMM904.cmd: 2.1380357746658216
Cycle 709
Total biomass:
Model iAF1260.cmd: 884.8195829531321
Model iJN1463.cmd: 20.91143782431624
Model IMM904.cmd: 2.150467080235681
Cycle 710
Total biomass:
Model iAF1260.cmd: 885.8158354218455
Model iJN1463.cmd: 20.962878198532614
Model IMM904.cmd: 2.1629319248296484
Cycle 711
Total biomass:
Model iAF1260.cmd: 886.8410021933552
Model iJN1463.cmd: 21.014270509427682
Model IMM904.cmd: 2.1753951110642795
Cycle 712
Total biomass:
Model iAF1260.cmd: 887.7181943061291
Model iJN1463.cmd: 21.065616722205117
Model IMM904.cmd: 2.1878338227762786
Cycle 713
Total biomass:
Model iAF1260.cmd: 888.6419748672643
Model iJN1463.cmd: 21.117848103868692
Model IMM904.cmd: 2.2004028722264395
Cycle 714
Total biomass:
Model iAF1260.cmd: 889.7140738553735
Model iJN1463.cmd: 21.17004247472339
Model IMM904.cmd: 2.2129782076277587
Cycle 715
Total biomass:
Model iAF1260.cmd: 890.7847022971491
Model iJN1463.cmd: 21.22123684605959
Model IMM904.cmd: 2.2253965253445522
Cycle 716
Total biomass:
Model iAF1260.cmd: 891.6161613346123
Model iJN1463.cmd: 21.27402802346355
Model IMM904.cmd: 2.237960021515517
Cycle 717
Total biomass:
Model iAF1260.cmd: 892.2478276883422
Model iJN1463.cmd: 21.325187479101267
Model IMM904.cmd: 2.2506341327880865
Cycle 718
Total biomass:
Model iAF1260.cmd: 892.9252115474551
Model iJN1463.cmd: 21.376326818034503
Model IMM904.cmd: 2.263325947073864
Cycle 719
Total biomass:
Model iAF1260.cmd: 893.6376444171798
Model iJN1463.cmd: 21.427443274787567
Model IMM904.cmd: 2.27599003362466
Cycle 720
Total biomass:
Model iAF1260.cmd: 894.340582313429
Model iJN1463.cmd: 21.478535097896753
Model IMM904.cmd: 2.288624073269585
Cycle 721

Total biomass:
Model iAF1260.cmd: 894.9696053338992
Model iJN1463.cmd: 21.529600397810775
Model IMM904.cmd: 2.301361739592016
Cycle 722
Total biomass:
Model iAF1260.cmd: 895.5022413892583
Model iJN1463.cmd: 21.58064015870542
Model IMM904.cmd: 2.3141255639102445
Cycle 723
Total biomass:
Model iAF1260.cmd: 896.194740882011
Model iJN1463.cmd: 21.631653613321184
Model IMM904.cmd: 2.3268962183902664
Cycle 724
Total biomass:
Model iAF1260.cmd: 896.8472161476209
Model iJN1463.cmd: 21.682639342543826
Model IMM904.cmd: 2.3396357999215946
Cycle 725
Total biomass:
Model iAF1260.cmd: 897.6219185939996
Model iJN1463.cmd: 21.735209554682033
Model IMM904.cmd: 2.352428043843664
Cycle 726
Total biomass:
Model iAF1260.cmd: 898.2173557120276
Model iJN1463.cmd: 21.78613019082613
Model IMM904.cmd: 2.36546759850342
Cycle 727
Total biomass:
Model iAF1260.cmd: 898.8678203130046
Model iJN1463.cmd: 21.83701923594293
Model IMM904.cmd: 2.3784636736144713
Cycle 728
Total biomass:
Model iAF1260.cmd: 899.5521555310681
Model iJN1463.cmd: 21.887874711146655
Model IMM904.cmd: 2.39139172631896
Cycle 729
Total biomass:
Model iAF1260.cmd: 900.1581080635515
Model iJN1463.cmd: 21.93869540675833
Model IMM904.cmd: 2.4044074322717806
Cycle 730
Total biomass:
Model iAF1260.cmd: 900.8122775455512
Model iJN1463.cmd: 21.989480326427653
Model IMM904.cmd: 2.4174366044208084
Cycle 731
Total biomass:
Model iAF1260.cmd: 901.5140199129246
Model iJN1463.cmd: 22.040227270896143
Model IMM904.cmd: 2.4304032115272247
Cycle 732
Total biomass:
Model iAF1260.cmd: 902.172033535751
Model iJN1463.cmd: 22.09093340339413
Model IMM904.cmd: 2.44341789884403
Cycle 733
Total biomass:
Model iAF1260.cmd: 902.8056645482296
Model iJN1463.cmd: 22.141597082947513
Model IMM904.cmd: 2.4564613246517966
Cycle 734
Total biomass:
Model iAF1260.cmd: 903.3993460370612
Model iJN1463.cmd: 22.192214630023468
Model IMM904.cmd: 2.4695569178912518
Cycle 735
Total biomass:
Model iAF1260.cmd: 904.0433072214202
Model iJN1463.cmd: 22.242789774265344
Model IMM904.cmd: 2.4826717932060736
Cycle 736
Total biomass:
Model iAF1260.cmd: 904.665206093676
Model iJN1463.cmd: 22.296543088857106
Model IMM904.cmd: 2.4957355348175154
Cycle 737
Total biomass:
Model iAF1260.cmd: 905.4821325318375
Model iJN1463.cmd: 22.347029793146973

Model IMM904.cmd: 2.5087839592235173
Cycle 738
Total biomass:
Model iAF1260.cmd: 906.2024593300924
Model iJN1463.cmd: 22.3974702632753
Model IMM904.cmd: 2.521913676330675
Cycle 739
Total biomass:
Model iAF1260.cmd: 906.809953492371
Model iJN1463.cmd: 22.447860245593603
Model IMM904.cmd: 2.5352444862730557
Cycle 740
Total biomass:
Model iAF1260.cmd: 907.4368471608329
Model iJN1463.cmd: 22.498229005955594
Model IMM904.cmd: 2.5485207735374416
Cycle 741
Total biomass:
Model iAF1260.cmd: 908.0895792898627
Model iJN1463.cmd: 22.54857398309783
Model IMM904.cmd: 2.561762472943279
Cycle 742
Total biomass:
Model iAF1260.cmd: 908.7761164854799
Model iJN1463.cmd: 22.598898096616534
Model IMM904.cmd: 2.574952038456799
Cycle 743
Total biomass:
Model iAF1260.cmd: 909.4660778116618
Model iJN1463.cmd: 22.64919946199707
Model IMM904.cmd: 2.5883389906302217
Cycle 744
Total biomass:
Model iAF1260.cmd: 910.1001216551524
Model iJN1463.cmd: 22.70029438961988
Model IMM904.cmd: 2.6016468954997536
Cycle 745
Total biomass:
Model iAF1260.cmd: 910.8176752937756
Model iJN1463.cmd: 22.75136468593299
Model IMM904.cmd: 2.6149368671637476
Cycle 746
Total biomass:
Model iAF1260.cmd: 911.4935254955298
Model iJN1463.cmd: 22.8015959718327
Model IMM904.cmd: 2.6282308228651803
Cycle 747
Total biomass:
Model iAF1260.cmd: 912.1249375116729
Model iJN1463.cmd: 22.851800038396096
Model IMM904.cmd: 2.64171468999626
Cycle 748
Total biomass:
Model iAF1260.cmd: 912.7880043269367
Model iJN1463.cmd: 22.901975713119
Model IMM904.cmd: 2.6551829560258753
Cycle 749
Total biomass:
Model iAF1260.cmd: 913.478638941147
Model iJN1463.cmd: 22.95212011935675
Model IMM904.cmd: 2.6686415140242232
Cycle 750
Total biomass:
Model iAF1260.cmd: 914.1421514612041
Model iJN1463.cmd: 23.002232256789565
Model IMM904.cmd: 2.6821239114483335
Cycle 751
Total biomass:
Model iAF1260.cmd: 914.8593290480927
Model iJN1463.cmd: 23.052312169810893
Model IMM904.cmd: 2.6957416890894415
Cycle 752
Total biomass:
Model iAF1260.cmd: 915.5017642579047
Model iJN1463.cmd: 23.102352231380664
Model IMM904.cmd: 2.7093614470156187
Cycle 753
Total biomass:
Model iAF1260.cmd: 916.1733680026794
Model iJN1463.cmd: 23.153968424574902
Model IMM904.cmd: 2.722968525123507
Cycle 754
Total biomass:

Model iAF1260.cmd: 916.9026236505225
Model iJN1463.cmd: 23.203935218720854
Model IMM904.cmd: 2.736563219471231
Cycle 755
Total biomass:
Model iAF1260.cmd: 917.5926183022889
Model iJN1463.cmd: 23.25386501444402
Model IMM904.cmd: 2.75019281391481
Cycle 756
Total biomass:
Model iAF1260.cmd: 918.2077367584698
Model iJN1463.cmd: 23.30375327083733
Model IMM904.cmd: 2.763825493793474
Cycle 757
Total biomass:
Model iAF1260.cmd: 918.9170568054661
Model iJN1463.cmd: 23.355209510425688
Model IMM904.cmd: 2.7774439692495907
Cycle 758
Total biomass:
Model iAF1260.cmd: 919.6629855343956
Model iJN1463.cmd: 23.40501225632222
Model IMM904.cmd: 2.791209411480296
Cycle 759
Total biomass:
Model iAF1260.cmd: 920.4187938244239
Model iJN1463.cmd: 23.45638678713322
Model IMM904.cmd: 2.804983405404331
Cycle 760
Total biomass:
Model iAF1260.cmd: 921.154039369571
Model iJN1463.cmd: 23.506090533813026
Model IMM904.cmd: 2.8188527570483743
Cycle 761
Total biomass:
Model iAF1260.cmd: 921.8590618224288
Model iJN1463.cmd: 23.55574566179733
Model IMM904.cmd: 2.83268487326017
Cycle 762
Total biomass:
Model iAF1260.cmd: 922.5451278853338
Model iJN1463.cmd: 23.60535137005607
Model IMM904.cmd: 2.846502144788755
Cycle 763
Total biomass:
Model iAF1260.cmd: 923.2970492277491
Model iJN1463.cmd: 23.65572794038551
Model IMM904.cmd: 2.8604067693644546
Cycle 764
Total biomass:
Model iAF1260.cmd: 924.0493151861982
Model iJN1463.cmd: 23.70526836491583
Model IMM904.cmd: 2.8743587088936193
Cycle 765
Total biomass:
Model iAF1260.cmd: 924.7479078229271
Model iJN1463.cmd: 23.754788377893234
Model IMM904.cmd: 2.8882660997110197
Cycle 766
Total biomass:
Model iAF1260.cmd: 925.4465330309529
Model iJN1463.cmd: 23.804287753570687
Model IMM904.cmd: 2.9021539884360075
Cycle 767
Total biomass:
Model iAF1260.cmd: 926.1327005181043
Model iJN1463.cmd: 23.85376642290922
Model IMM904.cmd: 2.91616022159739
Cycle 768
Total biomass:
Model iAF1260.cmd: 926.7885618868086
Model iJN1463.cmd: 23.904038347274287
Model IMM904.cmd: 2.93019712483576
Cycle 769
Total biomass:
Model iAF1260.cmd: 927.513663229714
Model iJN1463.cmd: 23.954283390399375
Model IMM904.cmd: 2.9441383895352407
Cycle 770
Total biomass:
Model iAF1260.cmd: 928.1902563255813
Model iJN1463.cmd: 24.003682346280552
Model IMM904.cmd: 2.958019688626032

Cycle 771
Total biomass:
Model iAF1260.cmd: 928.8444290346448
Model iJN1463.cmd: 24.05305189439679
Model IMM904.cmd: 2.9719112334723983
Cycle 772
Total biomass:
Model iAF1260.cmd: 929.5203078519929
Model iJN1463.cmd: 24.102393000115956
Model IMM904.cmd: 2.985879883032647
Cycle 773
Total biomass:
Model iAF1260.cmd: 930.163617223192
Model iJN1463.cmd: 24.15251999304356
Model IMM904.cmd: 2.999952604529531
Cycle 774
Total biomass:
Model iAF1260.cmd: 930.923115783411
Model iJN1463.cmd: 24.201801282098995
Model IMM904.cmd: 3.0140794419575783
Cycle 775
Total biomass:
Model iAF1260.cmd: 931.6408701618637
Model iJN1463.cmd: 24.251042734154638
Model IMM904.cmd: 3.0281802390520105
Cycle 776
Total biomass:
Model iAF1260.cmd: 932.3279827770506
Model iJN1463.cmd: 24.300245409258906
Model IMM904.cmd: 3.0423286557438165
Cycle 777
Total biomass:
Model iAF1260.cmd: 933.0638698700801
Model iJN1463.cmd: 24.349409810895015
Model IMM904.cmd: 3.0565074402277053
Cycle 778
Total biomass:
Model iAF1260.cmd: 933.8940288995591
Model iJN1463.cmd: 24.398532235577957
Model IMM904.cmd: 3.070669171834032
Cycle 779
Total biomass:
Model iAF1260.cmd: 934.55847313784
Model iJN1463.cmd: 24.44761298461968
Model IMM904.cmd: 3.084863432131156
Cycle 780
Total biomass:
Model iAF1260.cmd: 935.301780711953
Model iJN1463.cmd: 24.49664959504742
Model IMM904.cmd: 3.0990551305914047
Cycle 781
Total biomass:
Model iAF1260.cmd: 936.0022578082883
Model iJN1463.cmd: 24.545640163798645
Model IMM904.cmd: 3.1132548322980473
Cycle 782
Total biomass:
Model iAF1260.cmd: 936.6393595401709
Model iJN1463.cmd: 24.594584902147936
Model IMM904.cmd: 3.127484596411443
Cycle 783
Total biomass:
Model iAF1260.cmd: 937.340120705748
Model iJN1463.cmd: 24.64348445527686
Model IMM904.cmd: 3.14173281728884
Cycle 784
Total biomass:
Model iAF1260.cmd: 937.9427838963663
Model iJN1463.cmd: 24.6923368025903
Model IMM904.cmd: 3.1559971904215383
Cycle 785
Total biomass:
Model iAF1260.cmd: 938.6805251277956
Model iJN1463.cmd: 24.741140722458535
Model IMM904.cmd: 3.170243851635832
Cycle 786
Total biomass:
Model iAF1260.cmd: 939.358381821054
Model iJN1463.cmd: 24.7898918456911
Model IMM904.cmd: 3.184522055886102
Cycle 787
Total biomass:
Model iAF1260.cmd: 940.0885229705268

Model iJN1463.cmd: 24.840248821472468
Model IMM904.cmd: 3.198888608520736
Cycle 788
Total biomass:
Model iAF1260.cmd: 940.8014577672416
Model iJN1463.cmd: 24.889776090854998
Model IMM904.cmd: 3.2132445433313923
Cycle 789
Total biomass:
Model iAF1260.cmd: 941.4287831937215
Model iJN1463.cmd: 24.938463310671413
Model IMM904.cmd: 3.227714610948018
Cycle 790
Total biomass:
Model iAF1260.cmd: 942.1603509486343
Model iJN1463.cmd: 24.98875602771297
Model IMM904.cmd: 3.242253504249556
Cycle 791
Total biomass:
Model iAF1260.cmd: 942.8426644726629
Model iJN1463.cmd: 25.038207202908463
Model IMM904.cmd: 3.2569137651883646
Cycle 792
Total biomass:
Model iAF1260.cmd: 943.5400783755821
Model iJN1463.cmd: 25.08681589155546
Model IMM904.cmd: 3.271510053171084
Cycle 793
Total biomass:
Model iAF1260.cmd: 944.2555160175622
Model iJN1463.cmd: 25.135390984564424
Model IMM904.cmd: 3.286109293943024
Cycle 794
Total biomass:
Model iAF1260.cmd: 944.9715155611659
Model iJN1463.cmd: 25.183935746250825
Model IMM904.cmd: 3.3008162721565872
Cycle 795
Total biomass:
Model iAF1260.cmd: 945.6642118614642
Model iJN1463.cmd: 25.232446154441476
Model IMM904.cmd: 3.315425315353108
Cycle 796
Total biomass:
Model iAF1260.cmd: 946.4366254038667
Model iJN1463.cmd: 25.281734925724955
Model IMM904.cmd: 3.330142005418968
Cycle 797
Total biomass:
Model iAF1260.cmd: 947.1344914333716
Model iJN1463.cmd: 25.33098206874291
Model IMM904.cmd: 3.344871913683318
Cycle 798
Total biomass:
Model iAF1260.cmd: 947.8139198295935
Model iJN1463.cmd: 25.380188580996013
Model IMM904.cmd: 3.3596165374631157
Cycle 799
Total biomass:
Model iAF1260.cmd: 948.5534433565136
Model iJN1463.cmd: 25.429354295036866
Model IMM904.cmd: 3.374369868963071
Cycle 800
Total biomass:
Model iAF1260.cmd: 949.2268747442807
Model iJN1463.cmd: 25.47766370269658
Model IMM904.cmd: 3.389174889916798
Cycle 801
Total biomass:
Model iAF1260.cmd: 949.9047791383028
Model iJN1463.cmd: 25.525928881217425
Model IMM904.cmd: 3.4039612644218837
Cycle 802
Total biomass:
Model iAF1260.cmd: 950.5197922359527
Model iJN1463.cmd: 25.574145403959626
Model IMM904.cmd: 3.418775822891095
Cycle 803
Total biomass:
Model iAF1260.cmd: 951.2673422622134
Model iJN1463.cmd: 25.622308983126615
Model IMM904.cmd: 3.433598201652799
Cycle 804

Total biomass:
Model iAF1260.cmd: 952.0833429325069
Model iJN1463.cmd: 25.670413688043762
Model IMM904.cmd: 3.4483914550494936
Cycle 805
Total biomass:
Model iAF1260.cmd: 952.7279415842717
Model iJN1463.cmd: 25.718464423953026
Model IMM904.cmd: 3.463205923017043
Cycle 806
Total biomass:
Model iAF1260.cmd: 953.464921922408
Model iJN1463.cmd: 25.766458805833054
Model IMM904.cmd: 3.478165748398537
Cycle 807
Total biomass:
Model iAF1260.cmd: 954.2678341534505
Model iJN1463.cmd: 25.814427448167674
Model IMM904.cmd: 3.493097744365908
Cycle 808
Total biomass:
Model iAF1260.cmd: 954.919335471883
Model iJN1463.cmd: 25.862377255927136
Model IMM904.cmd: 3.508033335801993
Cycle 809
Total biomass:
Model iAF1260.cmd: 955.641155854955
Model iJN1463.cmd: 25.912723828029936
Model IMM904.cmd: 3.5230984165170565
Cycle 810
Total biomass:
Model iAF1260.cmd: 956.310313069092
Model iJN1463.cmd: 25.960634880207653
Model IMM904.cmd: 3.538099570998043
Cycle 811
Total biomass:
Model iAF1260.cmd: 957.0373071254978
Model iJN1463.cmd: 26.00852622390032
Model IMM904.cmd: 3.5530901464318037
Cycle 812
Total biomass:
Model iAF1260.cmd: 957.6927239811896
Model iJN1463.cmd: 26.05639628634899
Model IMM904.cmd: 3.5680462213149875
Cycle 813
Total biomass:
Model iAF1260.cmd: 958.4324989440781
Model iJN1463.cmd: 26.10424315024541
Model IMM904.cmd: 3.583067529434564
Cycle 814
Total biomass:
Model iAF1260.cmd: 959.1446994785324
Model iJN1463.cmd: 26.152066654992925
Model IMM904.cmd: 3.5981794323764063
Cycle 815
Total biomass:
Model iAF1260.cmd: 959.8191644094268
Model iJN1463.cmd: 26.199864773380117
Model IMM904.cmd: 3.6132600233446754
Cycle 816
Total biomass:
Model iAF1260.cmd: 960.5607874748292
Model iJN1463.cmd: 26.247637517367775
Model IMM904.cmd: 3.6284394176228436
Cycle 817
Total biomass:
Model iAF1260.cmd: 961.3286262335557
Model iJN1463.cmd: 26.295377902953234
Model IMM904.cmd: 3.643618554471874
Cycle 818
Total biomass:
Model iAF1260.cmd: 962.0830239202887
Model iJN1463.cmd: 26.3430879082203
Model IMM904.cmd: 3.6588342686418587
Cycle 819
Total biomass:
Model iAF1260.cmd: 962.8680958373068
Model iJN1463.cmd: 26.390765958193096
Model IMM904.cmd: 3.674099977142669
Cycle 820
Total biomass:
Model iAF1260.cmd: 963.5587671925421
Model iJN1463.cmd: 26.438406572656838

Model IMM904.cmd: 3.689358258304457
Cycle 821
Total biomass:
Model iAF1260.cmd: 964.2391853712212
Model iJN1463.cmd: 26.486014806827534
Model IMM904.cmd: 3.704705096061744
Cycle 822
Total biomass:
Model iAF1260.cmd: 965.0125135408958
Model iJN1463.cmd: 26.53359137313721
Model IMM904.cmd: 3.720081780838468
Cycle 823
Total biomass:
Model iAF1260.cmd: 965.6346212647767
Model iJN1463.cmd: 26.58113306083403
Model IMM904.cmd: 3.735444597596499
Cycle 824
Total biomass:
Model iAF1260.cmd: 966.3634004923745
Model iJN1463.cmd: 26.628640508962818
Model IMM904.cmd: 3.7507992364019596
Cycle 825
Total biomass:
Model iAF1260.cmd: 967.1919211112998
Model iJN1463.cmd: 26.676935135540962
Model IMM904.cmd: 3.7661757238935105
Cycle 826
Total biomass:
Model iAF1260.cmd: 967.9514656568736
Model iJN1463.cmd: 26.72437581384118
Model IMM904.cmd: 3.7815492804364874
Cycle 827
Total biomass:
Model iAF1260.cmd: 968.6087408192486
Model iJN1463.cmd: 26.772601111922746
Model IMM904.cmd: 3.796914235959746
Cycle 828
Total biomass:
Model iAF1260.cmd: 969.3481977762459
Model iJN1463.cmd: 26.819988742443865
Model IMM904.cmd: 3.812333065253849
Cycle 829
Total biomass:
Model iAF1260.cmd: 970.0671663490426
Model iJN1463.cmd: 26.867375899145625
Model IMM904.cmd: 3.8277509782926953
Cycle 830
Total biomass:
Model iAF1260.cmd: 970.7542707392679
Model iJN1463.cmd: 26.914762582239685
Model IMM904.cmd: 3.8432714316618615
Cycle 831
Total biomass:
Model iAF1260.cmd: 971.4152332301658
Model iJN1463.cmd: 26.96214879126475
Model IMM904.cmd: 3.858788244049546
Cycle 832
Total biomass:
Model iAF1260.cmd: 972.1014831107401
Model iJN1463.cmd: 27.0095345351398
Model IMM904.cmd: 3.8743779208204545
Cycle 833
Total biomass:
Model iAF1260.cmd: 972.8088608515088
Model iJN1463.cmd: 27.05774069126241
Model IMM904.cmd: 3.889956280114238
Cycle 834
Total biomass:
Model iAF1260.cmd: 973.4726359021162
Model iJN1463.cmd: 27.105125473660184
Model IMM904.cmd: 3.9057097425431913
Cycle 835
Total biomass:
Model iAF1260.cmd: 974.2410136821503
Model iJN1463.cmd: 27.152509782462268
Model IMM904.cmd: 3.9214942590176345
Cycle 836
Total biomass:
Model iAF1260.cmd: 974.9845934419571
Model iJN1463.cmd: 27.200678867868785
Model IMM904.cmd: 3.937126624654409
Cycle 837
Total biomass:

Model iAF1260.cmd: 975.7329676152499
Model iJN1463.cmd: 27.248834461938248
Model IMM904.cmd: 3.9527326077077953
Cycle 838
Total biomass:
Model iAF1260.cmd: 976.4749065849996
Model iJN1463.cmd: 27.296217330204737
Model IMM904.cmd: 3.9684971333385373
Cycle 839
Total biomass:
Model iAF1260.cmd: 977.1600491595731
Model iJN1463.cmd: 27.343599724698198
Model IMM904.cmd: 3.9842130224240426
Cycle 840
Total biomass:
Model iAF1260.cmd: 977.842106508567
Model iJN1463.cmd: 27.39098164511684
Model IMM904.cmd: 3.9999459947134257
Cycle 841
Total biomass:
Model iAF1260.cmd: 978.4977064289315
Model iJN1463.cmd: 27.438363091964007
Model IMM904.cmd: 4.015743859697045
Cycle 842
Total biomass:
Model iAF1260.cmd: 979.1999421270654
Model iJN1463.cmd: 27.485744065030534
Model IMM904.cmd: 4.031581656878607
Cycle 843
Total biomass:
Model iAF1260.cmd: 979.8211532663308
Model iJN1463.cmd: 27.533124563455402
Model IMM904.cmd: 4.047440825134448
Cycle 844
Total biomass:
Model iAF1260.cmd: 980.5461977152928
Model iJN1463.cmd: 27.5805045886256
Model IMM904.cmd: 4.0634178664600356
Cycle 845
Total biomass:
Model iAF1260.cmd: 981.3361582666782
Model iJN1463.cmd: 27.627884140292263
Model IMM904.cmd: 4.079358999513321
Cycle 846
Total biomass:
Model iAF1260.cmd: 982.1560450417543
Model iJN1463.cmd: 27.67526321863809
Model IMM904.cmd: 4.095323476752855
Cycle 847
Total biomass:
Model iAF1260.cmd: 982.9035908009694
Model iJN1463.cmd: 27.722641822685404
Model IMM904.cmd: 4.111309326839735
Cycle 848
Total biomass:
Model iAF1260.cmd: 983.6955762580639
Model iJN1463.cmd: 27.770019953074947
Model IMM904.cmd: 4.127320889700484
Cycle 849
Total biomass:
Model iAF1260.cmd: 984.3635879379935
Model iJN1463.cmd: 27.81739760956355
Model IMM904.cmd: 4.14329462912699
Cycle 850
Total biomass:
Model iAF1260.cmd: 985.0749624972907
Model iJN1463.cmd: 27.86477479224759
Model IMM904.cmd: 4.159283546175257
Cycle 851
Total biomass:
Model iAF1260.cmd: 985.7340110409393
Model iJN1463.cmd: 27.912151636626046
Model IMM904.cmd: 4.175357336718984
Cycle 852
Total biomass:
Model iAF1260.cmd: 986.5720541541882
Model iJN1463.cmd: 27.960347282598413
Model IMM904.cmd: 4.191554140714291
Cycle 853
Total biomass:
Model iAF1260.cmd: 987.2649373598464
Model iJN1463.cmd: 28.007723070250076
Model IMM904.cmd: 4.2077291379827075

Cycle 854
Total biomass:
Model iAF1260.cmd: 988.0104489368271
Model iJN1463.cmd: 28.05509837081369
Model IMM904.cmd: 4.223996176910499
Cycle 855
Total biomass:
Model iAF1260.cmd: 988.7547641553034
Model iJN1463.cmd: 28.10247319096187
Model IMM904.cmd: 4.240313028440019
Cycle 856
Total biomass:
Model iAF1260.cmd: 989.4819798067962
Model iJN1463.cmd: 28.149847533445012
Model IMM904.cmd: 4.256527562217581
Cycle 857
Total biomass:
Model iAF1260.cmd: 990.1333091729185
Model iJN1463.cmd: 28.197221400644036
Model IMM904.cmd: 4.272815840759482
Cycle 858
Total biomass:
Model iAF1260.cmd: 990.9493589069414
Model iJN1463.cmd: 28.245407837433792
Model IMM904.cmd: 4.289157319220738
Cycle 859
Total biomass:
Model iAF1260.cmd: 991.7004173011783
Model iJN1463.cmd: 28.292780746128297
Model IMM904.cmd: 4.305553645970913
Cycle 860
Total biomass:
Model iAF1260.cmd: 992.454584979855
Model iJN1463.cmd: 28.340153179904632
Model IMM904.cmd: 4.321915084357375
Cycle 861
Total biomass:
Model iAF1260.cmd: 993.2491974000585
Model iJN1463.cmd: 28.387526459619323
Model IMM904.cmd: 4.338245996705878
Cycle 862
Total biomass:
Model iAF1260.cmd: 994.1207728524951
Model iJN1463.cmd: 28.434897991933997
Model IMM904.cmd: 4.354585206192806
Cycle 863
Total biomass:
Model iAF1260.cmd: 994.8524884828163
Model iJN1463.cmd: 28.48226900339555
Model IMM904.cmd: 4.371039305438773
Cycle 864
Total biomass:
Model iAF1260.cmd: 995.5430878270756
Model iJN1463.cmd: 28.529639540891974
Model IMM904.cmd: 4.387505183796613
Cycle 865
Total biomass:
Model iAF1260.cmd: 996.3510456930028
Model iJN1463.cmd: 28.57700960421092
Model IMM904.cmd: 4.404058059816806
Cycle 866
Total biomass:
Model iAF1260.cmd: 996.9928162859408
Model iJN1463.cmd: 28.624379193555367
Model IMM904.cmd: 4.420596146384364
Cycle 867
Total biomass:
Model iAF1260.cmd: 997.7702178782264
Model iJN1463.cmd: 28.67174830874446
Model IMM904.cmd: 4.437022559129331
Cycle 868
Total biomass:
Model iAF1260.cmd: 998.4484272760542
Model iJN1463.cmd: 28.719116950652186
Model IMM904.cmd: 4.453603626228859
Cycle 869
Total biomass:
Model iAF1260.cmd: 999.2268590156418
Model iJN1463.cmd: 28.7664851182302
Model IMM904.cmd: 4.4701853757771906
Cycle 870
Total biomass:
Model iAF1260.cmd: 1000.0294800561694

Model iJN1463.cmd: 28.813852811849923
Model IMM904.cmd: 4.4868178646952455
Cycle 871
Total biomass:
Model iAF1260.cmd: 1000.7694949530463
Model iJN1463.cmd: 28.862040220522168
Model IMM904.cmd: 4.503461575826366
Cycle 872
Total biomass:
Model iAF1260.cmd: 1001.5103290727798
Model iJN1463.cmd: 28.91022864181221
Model IMM904.cmd: 4.520118246431437
Cycle 873
Total biomass:
Model iAF1260.cmd: 1002.2962180389476
Model iJN1463.cmd: 28.958415589752583
Model IMM904.cmd: 4.536847074973176
Cycle 874
Total biomass:
Model iAF1260.cmd: 1003.0455006715916
Model iJN1463.cmd: 29.005781363557485
Model IMM904.cmd: 4.553562914366273
Cycle 875
Total biomass:
Model iAF1260.cmd: 1003.7040635276192
Model iJN1463.cmd: 29.053146663655856
Model IMM904.cmd: 4.570394726887708
Cycle 876
Total biomass:
Model iAF1260.cmd: 1004.3997831980488
Model iJN1463.cmd: 29.10133409851312
Model IMM904.cmd: 4.587154871052895
Cycle 877
Total biomass:
Model iAF1260.cmd: 1005.1265393098399
Model iJN1463.cmd: 29.148698443045237
Model IMM904.cmd: 4.603953624205984
Cycle 878
Total biomass:
Model iAF1260.cmd: 1005.8076552658357
Model iJN1463.cmd: 29.196062313748158
Model IMM904.cmd: 4.620765343146703
Cycle 879
Total biomass:
Model iAF1260.cmd: 1006.5970508874021
Model iJN1463.cmd: 29.24342571115007
Model IMM904.cmd: 4.6376269178453535
Cycle 880
Total biomass:
Model iAF1260.cmd: 1007.330941542479
Model iJN1463.cmd: 29.290788634531534
Model IMM904.cmd: 4.654615815610142
Cycle 881
Total biomass:
Model iAF1260.cmd: 1008.0090705679304
Model iJN1463.cmd: 29.33815108423242
Model IMM904.cmd: 4.671559744349968
Cycle 882
Total biomass:
Model iAF1260.cmd: 1008.7149388502007
Model iJN1463.cmd: 29.38551306023593
Model IMM904.cmd: 4.688504114572688
Cycle 883
Total biomass:
Model iAF1260.cmd: 1009.4873589024207
Model iJN1463.cmd: 29.432874562568717
Model IMM904.cmd: 4.705585679976064
Cycle 884
Total biomass:
Model iAF1260.cmd: 1010.2373949624534
Model iJN1463.cmd: 29.480235591578566
Model IMM904.cmd: 4.722598753306502
Cycle 885
Total biomass:
Model iAF1260.cmd: 1010.9100815622667
Model iJN1463.cmd: 29.527596146700972
Model IMM904.cmd: 4.739699812280831
Cycle 886
Total biomass:
Model iAF1260.cmd: 1011.6015518044376
Model iJN1463.cmd: 29.574956228607935
Model IMM904.cmd: 4.756815269602776
Cycle 887

Total biomass:
Model iAF1260.cmd: 1012.3510036768271
Model iJN1463.cmd: 29.62231583638884
Model IMM904.cmd: 4.773918935311341
Cycle 888
Total biomass:
Model iAF1260.cmd: 1013.1063038697473
Model iJN1463.cmd: 29.671306702390297
Model IMM904.cmd: 4.791065499329663
Cycle 889
Total biomass:
Model iAF1260.cmd: 1014.0225454394925
Model iJN1463.cmd: 29.718665346297016
Model IMM904.cmd: 4.808197718539544
Cycle 890
Total biomass:
Model iAF1260.cmd: 1014.7703426408747
Model iJN1463.cmd: 29.76602351672613
Model IMM904.cmd: 4.825391659228347
Cycle 891
Total biomass:
Model iAF1260.cmd: 1015.6304904189493
Model iJN1463.cmd: 29.813381213488995
Model IMM904.cmd: 4.84259157530752
Cycle 892
Total biomass:
Model iAF1260.cmd: 1016.4003766336928
Model iJN1463.cmd: 29.86073843696043
Model IMM904.cmd: 4.859804107012244
Cycle 893
Total biomass:
Model iAF1260.cmd: 1017.1776517064999
Model iJN1463.cmd: 29.908095186424323
Model IMM904.cmd: 4.877043340181693
Cycle 894
Total biomass:
Model iAF1260.cmd: 1017.9654272154097
Model iJN1463.cmd: 29.955451462528227
Model IMM904.cmd: 4.894320666552252
Cycle 895
Total biomass:
Model iAF1260.cmd: 1018.6982359793941
Model iJN1463.cmd: 30.002807265355962
Model IMM904.cmd: 4.911617125618422
Cycle 896
Total biomass:
Model iAF1260.cmd: 1019.3849240544686
Model iJN1463.cmd: 30.050976883251824
Model IMM904.cmd: 4.9289325265924475
Cycle 897
Total biomass:
Model iAF1260.cmd: 1020.0918232134127
Model iJN1463.cmd: 30.098331730698792
Model IMM904.cmd: 4.946216294566936
Cycle 898
Total biomass:
Model iAF1260.cmd: 1020.8595354374544
Model iJN1463.cmd: 30.146500158950747
Model IMM904.cmd: 4.963651228926192
Cycle 899
Total biomass:
Model iAF1260.cmd: 1021.6005921703294
Model iJN1463.cmd: 30.19544367588647
Model IMM904.cmd: 4.981123654896459
Cycle 900
Total biomass:
Model iAF1260.cmd: 1022.4600271591996
Model iJN1463.cmd: 30.242797078146204
Model IMM904.cmd: 4.998559892745506
Cycle 901
Total biomass:
Model iAF1260.cmd: 1023.3276460544221
Model iJN1463.cmd: 30.29015000729466
Model IMM904.cmd: 5.016045255835186
Cycle 902
Total biomass:
Model iAF1260.cmd: 1024.1669613332626
Model iJN1463.cmd: 30.33750246248062
Model IMM904.cmd: 5.033538426308231
Cycle 903
Total biomass:
Model iAF1260.cmd: 1024.9496656007254
Model iJN1463.cmd: 30.38485444415713

Model IMM904.cmd: 5.051040200198522
Cycle 904
Total biomass:
Model iAF1260.cmd: 1025.7497697487663
Model iJN1463.cmd: 30.43220595239328
Model IMM904.cmd: 5.068563784879876
Cycle 905
Total biomass:
Model iAF1260.cmd: 1026.5529972331296
Model iJN1463.cmd: 30.479556987248266
Model IMM904.cmd: 5.08608901331941
Cycle 906
Total biomass:
Model iAF1260.cmd: 1027.2281298604594
Model iJN1463.cmd: 30.527733735675184
Model IMM904.cmd: 5.103622719441365
Cycle 907
Total biomass:
Model iAF1260.cmd: 1027.9852388322545
Model iJN1463.cmd: 30.575083850507824
Model IMM904.cmd: 5.121190742668654
Cycle 908
Total biomass:
Model iAF1260.cmd: 1028.7474744877084
Model iJN1463.cmd: 30.623247376636563
Model IMM904.cmd: 5.138745551476739
Cycle 909
Total biomass:
Model iAF1260.cmd: 1029.4643918882466
Model iJN1463.cmd: 30.67059650109148
Model IMM904.cmd: 5.156289637918325
Cycle 910
Total biomass:
Model iAF1260.cmd: 1030.2522462190157
Model iJN1463.cmd: 30.71794515231648
Model IMM904.cmd: 5.173873615367115
Cycle 911
Total biomass:
Model iAF1260.cmd: 1031.0911760738018
Model iJN1463.cmd: 30.7652933295528
Model IMM904.cmd: 5.191465029151417
Cycle 912
Total biomass:
Model iAF1260.cmd: 1031.9340574276462
Model iJN1463.cmd: 30.81264103355756
Model IMM904.cmd: 5.209099032169928
Cycle 913
Total biomass:
Model iAF1260.cmd: 1032.6740828454988
Model iJN1463.cmd: 30.85998826394535
Model IMM904.cmd: 5.22674022444386
Cycle 914
Total biomass:
Model iAF1260.cmd: 1033.5072610223056
Model iJN1463.cmd: 30.9081443855186
Model IMM904.cmd: 5.24437275756996
Cycle 915
Total biomass:
Model iAF1260.cmd: 1034.3511590504716
Model iJN1463.cmd: 30.95549066074062
Model IMM904.cmd: 5.261986983868454
Cycle 916
Total biomass:
Model iAF1260.cmd: 1035.1287926142556
Model iJN1463.cmd: 31.002836462602854
Model IMM904.cmd: 5.279649008110829
Cycle 917
Total biomass:
Model iAF1260.cmd: 1035.9226674115407
Model iJN1463.cmd: 31.05018179087332
Model IMM904.cmd: 5.297327138885024
Cycle 918
Total biomass:
Model iAF1260.cmd: 1036.7123651922539
Model iJN1463.cmd: 31.097526652246543
Model IMM904.cmd: 5.315023877361182
Cycle 919
Total biomass:
Model iAF1260.cmd: 1037.5464087922892
Model iJN1463.cmd: 31.144871046448532
Model IMM904.cmd: 5.332720726537472
Cycle 920
Total biomass:

Model iAF1260.cmd: 1038.3169509276186
Model iJN1463.cmd: 31.192214956327074
Model IMM904.cmd: 5.350460089000806
Cycle 921
Total biomass:
Model iAF1260.cmd: 1039.1393881051517
Model iJN1463.cmd: 31.239558393550173
Model IMM904.cmd: 5.36822523593096
Cycle 922
Total biomass:
Model iAF1260.cmd: 1039.8308867481376
Model iJN1463.cmd: 31.286901356359127
Model IMM904.cmd: 5.3860425883043055
Cycle 923
Total biomass:
Model iAF1260.cmd: 1040.6517912435977
Model iJN1463.cmd: 31.334243846044885
Model IMM904.cmd: 5.403845922734625
Cycle 924
Total biomass:
Model iAF1260.cmd: 1041.47134184047
Model iJN1463.cmd: 31.38158586345358
Model IMM904.cmd: 5.4216699914509965
Cycle 925
Total biomass:
Model iAF1260.cmd: 1042.2815840974579
Model iJN1463.cmd: 31.42892740588484
Model IMM904.cmd: 5.439556900865537
Cycle 926
Total biomass:
Model iAF1260.cmd: 1043.145785172624
Model iJN1463.cmd: 31.476268475433493
Model IMM904.cmd: 5.457410392997247
Cycle 927
Total biomass:
Model iAF1260.cmd: 1043.927238374526
Model iJN1463.cmd: 31.523609070915366
Model IMM904.cmd: 5.47529660243619
Cycle 928
Total biomass:
Model iAF1260.cmd: 1044.6623304367959
Model iJN1463.cmd: 31.57094919306289
Model IMM904.cmd: 5.493182500498124
Cycle 929
Total biomass:
Model iAF1260.cmd: 1045.4948954144572
Model iJN1463.cmd: 31.618288841733445
Model IMM904.cmd: 5.511068147050411
Cycle 930
Total biomass:
Model iAF1260.cmd: 1046.307653637228
Model iJN1463.cmd: 31.665628016541145
Model IMM904.cmd: 5.52895368701487
Cycle 931
Total biomass:
Model iAF1260.cmd: 1047.0670136442882
Model iJN1463.cmd: 31.713794593144318
Model IMM904.cmd: 5.546838957456893
Cycle 932
Total biomass:
Model iAF1260.cmd: 1047.9535093551774
Model iJN1463.cmd: 31.76113281267936
Model IMM904.cmd: 5.564724048592223
Cycle 933
Total biomass:
Model iAF1260.cmd: 1048.7116189307549
Model iJN1463.cmd: 31.80847055883002
Model IMM904.cmd: 5.582608922487845
Cycle 934
Total biomass:
Model iAF1260.cmd: 1049.4696986454776
Model iJN1463.cmd: 31.85580783172096
Model IMM904.cmd: 5.6004935726512155
Cycle 935
Total biomass:
Model iAF1260.cmd: 1050.2754794092891
Model iJN1463.cmd: 31.9031446308811
Model IMM904.cmd: 5.618378043580073
Cycle 936
Total biomass:
Model iAF1260.cmd: 1051.1438972467079
Model iJN1463.cmd: 31.950480956414623
Model IMM904.cmd: 5.636263120363553

Cycle 937
Total biomass:
Model iAF1260.cmd: 1051.9916768700446
Model iJN1463.cmd: 31.997816808672496
Model IMM904.cmd: 5.65414843059999
Cycle 938
Total biomass:
Model iAF1260.cmd: 1052.759852483561
Model iJN1463.cmd: 32.04515218732663
Model IMM904.cmd: 5.67203298975322
Cycle 939
Total biomass:
Model iAF1260.cmd: 1053.5938406928638
Model iJN1463.cmd: 32.09248709269967
Model IMM904.cmd: 5.689917245386022
Cycle 940
Total biomass:
Model iAF1260.cmd: 1054.4417381998612
Model iJN1463.cmd: 32.13982152437729
Model IMM904.cmd: 5.707801212492462
Cycle 941
Total biomass:
Model iAF1260.cmd: 1055.2229198968716
Model iJN1463.cmd: 32.187155483576944
Model IMM904.cmd: 5.725684883427309
Cycle 942
Total biomass:
Model iAF1260.cmd: 1056.0398829230896
Model iJN1463.cmd: 32.23448896929291
Model IMM904.cmd: 5.743568775803559
Cycle 943
Total biomass:
Model iAF1260.cmd: 1056.83494891332
Model iJN1463.cmd: 32.28182198082463
Model IMM904.cmd: 5.7614542744216655
Cycle 944
Total biomass:
Model iAF1260.cmd: 1057.5867440106488
Model iJN1463.cmd: 32.32915451952335
Model IMM904.cmd: 5.779339175725182
Cycle 945
Total biomass:
Model iAF1260.cmd: 1058.4564568712824
Model iJN1463.cmd: 32.376486584914524
Model IMM904.cmd: 5.797222710694316
Cycle 946
Total biomass:
Model iAF1260.cmd: 1059.2135804080378
Model iJN1463.cmd: 32.423818177034875
Model IMM904.cmd: 5.815105585149021
Cycle 947
Total biomass:
Model iAF1260.cmd: 1060.0641329283023
Model iJN1463.cmd: 32.47114929645137
Model IMM904.cmd: 5.832988496352117
Cycle 948
Total biomass:
Model iAF1260.cmd: 1060.8144523861063
Model iJN1463.cmd: 32.51847994184816
Model IMM904.cmd: 5.850870940976503
Cycle 949
Total biomass:
Model iAF1260.cmd: 1061.6558832301034
Model iJN1463.cmd: 32.56664005486399
Model IMM904.cmd: 5.868753048569129
Cycle 950
Total biomass:
Model iAF1260.cmd: 1062.47788394869
Model iJN1463.cmd: 32.61396974545322
Model IMM904.cmd: 5.886635296490771
Cycle 951
Total biomass:
Model iAF1260.cmd: 1063.3770110021023
Model iJN1463.cmd: 32.66129896297559
Model IMM904.cmd: 5.904517048833191
Cycle 952
Total biomass:
Model iAF1260.cmd: 1064.1465132038595
Model iJN1463.cmd: 32.70862771005669
Model IMM904.cmd: 5.92239861774498
Cycle 953
Total biomass:
Model iAF1260.cmd: 1064.8786517375836

Model iJN1463.cmd: 32.7559559806402
Model IMM904.cmd: 5.940279940711946
Cycle 954
Total biomass:
Model iAF1260.cmd: 1065.7075093754981
Model iJN1463.cmd: 32.8032837778881
Model IMM904.cmd: 5.958161093268003
Cycle 955
Total biomass:
Model iAF1260.cmd: 1066.5015379924491
Model iJN1463.cmd: 32.851407949324404
Model IMM904.cmd: 5.976042026139323
Cycle 956
Total biomass:
Model iAF1260.cmd: 1067.2374520342803
Model iJN1463.cmd: 32.89873479211455
Model IMM904.cmd: 5.993922790395469
Cycle 957
Total biomass:
Model iAF1260.cmd: 1068.0036051884879
Model iJN1463.cmd: 32.94606116587221
Model IMM904.cmd: 6.011803372937259
Cycle 958
Total biomass:
Model iAF1260.cmd: 1068.7791557848304
Model iJN1463.cmd: 32.99338706391397
Model IMM904.cmd: 6.029683749178495
Cycle 959
Total biomass:
Model iAF1260.cmd: 1069.506462324731
Model iJN1463.cmd: 33.04071248913076
Model IMM904.cmd: 6.047563955433308
Cycle 960
Total biomass:
Model iAF1260.cmd: 1070.3046722346728
Model iJN1463.cmd: 33.08803743932848
Model IMM904.cmd: 6.065444457727116
Cycle 961
Total biomass:
Model iAF1260.cmd: 1071.0868786061483
Model iJN1463.cmd: 33.135361916153215
Model IMM904.cmd: 6.083324841081615
Cycle 962
Total biomass:
Model iAF1260.cmd: 1071.9402449934516
Model iJN1463.cmd: 33.18432166836896
Model IMM904.cmd: 6.101204722647566
Cycle 963
Total biomass:
Model iAF1260.cmd: 1072.744039849644
Model iJN1463.cmd: 33.232468652736266
Model IMM904.cmd: 6.119084352404604
Cycle 964
Total biomass:
Model iAF1260.cmd: 1073.5673964841826
Model iJN1463.cmd: 33.27979168486966
Model IMM904.cmd: 6.136963684608821
Cycle 965
Total biomass:
Model iAF1260.cmd: 1074.3270118752787
Model iJN1463.cmd: 33.32711424380885
Model IMM904.cmd: 6.154842821560831
Cycle 966
Total biomass:
Model iAF1260.cmd: 1075.1480289875994
Model iJN1463.cmd: 33.37443632958595
Model IMM904.cmd: 6.17272229231615
Cycle 967
Total biomass:
Model iAF1260.cmd: 1076.0173755720734
Model iJN1463.cmd: 33.42175794208618
Model IMM904.cmd: 6.1906012007187545
Cycle 968
Total biomass:
Model iAF1260.cmd: 1076.8361727069498
Model iJN1463.cmd: 33.46907908126545
Model IMM904.cmd: 6.2084798132984504
Cycle 969
Total biomass:
Model iAF1260.cmd: 1077.7258067813825
Model iJN1463.cmd: 33.51639974721189
Model IMM904.cmd: 6.226358762189659
Cycle 970

Total biomass:
Model iAF1260.cmd: 1078.561930217504
Model iJN1463.cmd: 33.563719940049886
Model IMM904.cmd: 6.244237235503117
Cycle 971
Total biomass:
Model iAF1260.cmd: 1079.5308599231307
Model iJN1463.cmd: 33.61103965973339
Model IMM904.cmd: 6.262115489540727
Cycle 972
Total biomass:
Model iAF1260.cmd: 1080.3282851008676
Model iJN1463.cmd: 33.65835890605645
Model IMM904.cmd: 6.279993393582226
Cycle 973
Total biomass:
Model iAF1260.cmd: 1081.1491002570176
Model iJN1463.cmd: 33.70567767919701
Model IMM904.cmd: 6.297871119773171
Cycle 974
Total biomass:
Model iAF1260.cmd: 1081.9044143517049
Model iJN1463.cmd: 33.75299597938373
Model IMM904.cmd: 6.31574863753406
Cycle 975
Total biomass:
Model iAF1260.cmd: 1082.7728063802006
Model iJN1463.cmd: 33.80031381556335
Model IMM904.cmd: 6.3336259594493205
Cycle 976
Total biomass:
Model iAF1260.cmd: 1083.6146274628409
Model iJN1463.cmd: 33.84763117443941
Model IMM904.cmd: 6.351503178550947
Cycle 977
Total biomass:
Model iAF1260.cmd: 1084.360009367827
Model iJN1463.cmd: 33.89494806719739
Model IMM904.cmd: 6.369380166800716
Cycle 978
Total biomass:
Model iAF1260.cmd: 1085.111177628301
Model iJN1463.cmd: 33.94226447728526
Model IMM904.cmd: 6.387256957484131
Cycle 979
Total biomass:
Model iAF1260.cmd: 1085.9386950664236
Model iJN1463.cmd: 33.989580413639054
Model IMM904.cmd: 6.4051335725844885
Cycle 980
Total biomass:
Model iAF1260.cmd: 1086.7597049995022
Model iJN1463.cmd: 34.03689587567106
Model IMM904.cmd: 6.423009999268867
Cycle 981
Total biomass:
Model iAF1260.cmd: 1087.6350640145017
Model iJN1463.cmd: 34.08421086432995
Model IMM904.cmd: 6.4408862663078805
Cycle 982
Total biomass:
Model iAF1260.cmd: 1088.465462266963
Model iJN1463.cmd: 34.13152537929737
Model IMM904.cmd: 6.4587623237335965
Cycle 983
Total biomass:
Model iAF1260.cmd: 1089.2308089013377
Model iJN1463.cmd: 34.1788394209908
Model IMM904.cmd: 6.476638225745491
Cycle 984
Total biomass:
Model iAF1260.cmd: 1090.1293912404085
Model iJN1463.cmd: 34.22615298949234
Model IMM904.cmd: 6.494513924428746
Cycle 985
Total biomass:
Model iAF1260.cmd: 1090.8244019517251
Model iJN1463.cmd: 34.273466084848216
Model IMM904.cmd: 6.512389451372513
Cycle 986
Total biomass:
Model iAF1260.cmd: 1091.6856581287082
Model iJN1463.cmd: 34.320778706946335


```

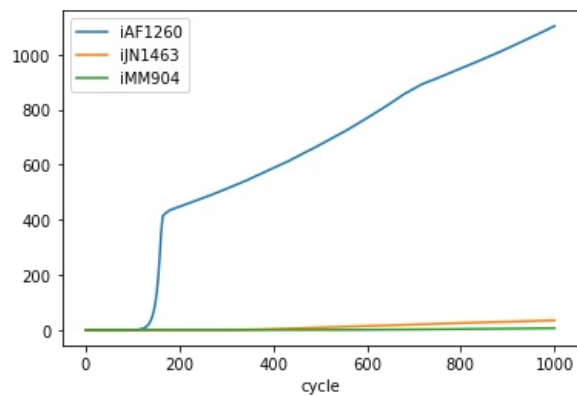
Model IMM904.cmd: 6.5302647906090865
Cycle 987
Total biomass:
Model iAF1260.cmd: 1092.511298382887
Model iJN1463.cmd: 34.36809085630274
Model IMM904.cmd: 6.5481399635927104
Cycle 988
Total biomass:
Model iAF1260.cmd: 1093.4411707592694
Model iJN1463.cmd: 34.415402532158865
Model IMM904.cmd: 6.566014936485668
Cycle 989
Total biomass:
Model iAF1260.cmd: 1094.3674543001084
Model iJN1463.cmd: 34.46271373505448
Model IMM904.cmd: 6.5838898983994225
Cycle 990
Total biomass:
Model iAF1260.cmd: 1095.1360236200849
Model iJN1463.cmd: 34.5100244647112
Model IMM904.cmd: 6.60176476025288
Cycle 991
Total biomass:
Model iAF1260.cmd: 1096.0254314502872
Model iJN1463.cmd: 34.557334721389445
Model IMM904.cmd: 6.61963927990031
Cycle 992
Total biomass:
Model iAF1260.cmd: 1096.8700897844906
Model iJN1463.cmd: 34.6046445049668
Model IMM904.cmd: 6.637513654920967
Cycle 993
Total biomass:
Model iAF1260.cmd: 1097.7439819334397
Model iJN1463.cmd: 34.65195381500812
Model IMM904.cmd: 6.6553877751448525
Cycle 994
Total biomass:
Model iAF1260.cmd: 1098.6091571936668
Model iJN1463.cmd: 34.699262652249864
Model IMM904.cmd: 6.673261706238356
Cycle 995
Total biomass:
Model iAF1260.cmd: 1099.4232993367257
Model iJN1463.cmd: 34.74657101631596
Model IMM904.cmd: 6.6911354407360175
Cycle 996
Total biomass:
Model iAF1260.cmd: 1100.2032848688336
Model iJN1463.cmd: 34.79387890737721
Model IMM904.cmd: 6.70900899026801
Cycle 997
Total biomass:
Model iAF1260.cmd: 1101.0814783858232
Model iJN1463.cmd: 34.842014806440304
Model IMM904.cmd: 6.726882369691555
Cycle 998
Total biomass:
Model iAF1260.cmd: 1101.8861374607452
Model iJN1463.cmd: 34.88932174288294
Model IMM904.cmd: 6.744755561044948
Cycle 999
Total biomass:
Model iAF1260.cmd: 1102.7096854543258
Model iJN1463.cmd: 34.93662820626048
Model IMM904.cmd: 6.762628583791135
Cycle 1000
Total biomass:
Model iAF1260.cmd: 1103.6112601302812
Model iJN1463.cmd: 34.98393419656978
Model IMM904.cmd: 6.780501423640032
Cycle 1001
End of simulation
Total time = 33750.174s

```

Para revisar la biomasa total

```
In [16]: sim.total_biomass.plot(x = "cycle")
```

Out[16]: <AxesSubplot:xlabel='cycle'>

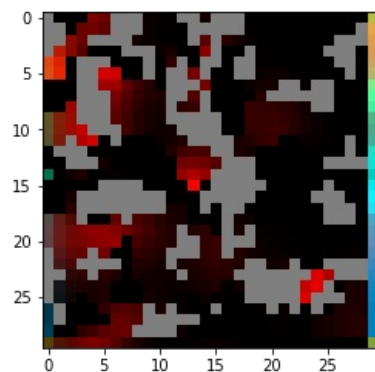


Graficamos los resultados de biomasa y demás metabolitos interesantes en el grid:

```
In [17]: im = sim.get_biomass_image('iAF1260', params.all_params['maxCycles'])
im2 = sim.get_biomass_image('iJN1463', params.all_params['maxCycles'])
im3 = sim.get_biomass_image('iMM904', params.all_params['maxCycles'])

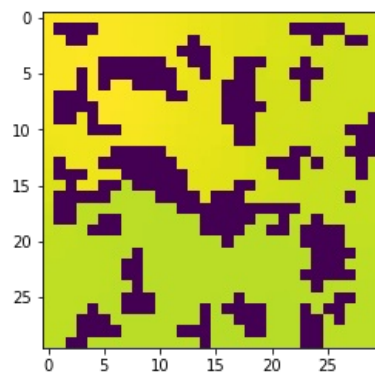
final = np.zeros((grid_size, grid_size, 3))
final[:, :, 0] = im / np.max(im)
final[:, :, 1] = im2 / np.max(im2)
final[:, :, 2] = im3 / np.max(im3)
for rock in rock_locs:
    final[rock[1]-1, rock[0]-1, 0:3] = 0.5
from matplotlib import pyplot as plt
plt.imshow(final)
```

Out[17]: <matplotlib.image.AxesImage at 0x11cbe097850>



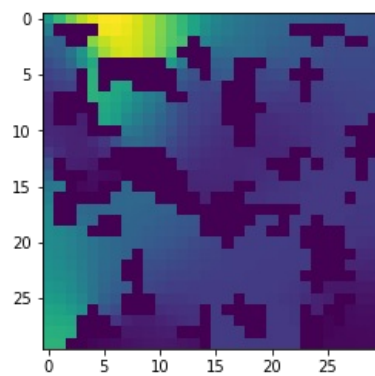
```
In [19]: plt.imshow(sim.get_metabolite_image("succ_e", params.all_params['maxCycles']))
```

Out[19]: <matplotlib.image.AxesImage at 0x11cc0a39910>



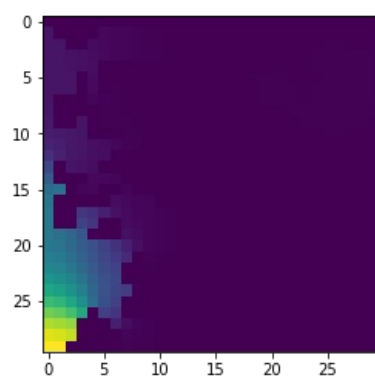
```
In [20]: plt.imshow(sim.get_metabolite_image("ac_e", params.all_params['maxCycles']))
```

Out[20]: <matplotlib.image.AxesImage at 0x11cbd83d100>



```
In [21]: plt.imshow(sim.get_metabolite_image("nh4_e",params.all_params['maxCycles']))
```

```
Out[21]: <matplotlib.image.AxesImage at 0x11cb9a497c0>
```



```
In [ ]:
```