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ÍNDICE DE NOTÍCIAS

AMBIENTE BRASIL

Especialistas alertam para longa luta contra aquecimento global

Nos últimos 50 anos, o nível do mar no sul da Flórida aumentou entre 13 e 20 centímetros "e as projeções são de que, no fim do século, possa subir entre 60 e 90 centímetros se não mudarmos nossas políticas", disse o senador democrata do estado, Bill Nelson.

Tigre siberiano solto por Putin foi para a China

Presidente soltou três animais em maio deste ano. Autoridades russas acompanham tigres por satélite.

União Europeia adota medidas para evitar que o ebola chegue a continente

Países têm estratégias de detecção em aeroportos e terminais de trem. Viajantes vindos de países afetados são orientados a medir temperatura.

Mulher sobrevive 17 dias em floresta tropical da Austrália

Shannon Fraser ficou desaparecida por mais de duas semanas em uma floresta tropical do norte da Austrália apareceu viva na quarta-feira (8), depois de sobreviver à base de água de rio e peixes e escapar de um crocodilo, segundo as autoridades e a imprensa local.

Praga agrícola produz substância antiaderente como estratégia de adaptação

Pesquisadores da USP e da University of California em Berkeley constatam que a Xylella fastidiosa produz partículas nanométricas de lipídeo para transitar e espalhar-se mais facilmente na planta.

Misteriosas bolinhas verdes infestam praia na Austrália

Batizadas de marimos, esferas do tamanho de bola de golfe invadiram praia perto de Sydney.

Plantio é estratégia de enfrentamento do aquecimento global

Grupo de cientistas contesta que estaria incorreta a "sabedoria convencional" segundo a qual o plantio de árvores auxilia no combate ao aquecimento global.

Grã-Bretanha abre centro de meteorologia espacial

O centro, que reúne pesquisadores britânicos e americanos, fará previsões da ocorrência de tempestades solares sobre o nosso planeta.

Imagens 'high tech' do HIV revelam brechas do vírus aos cientistas

Especialistas descreveram a estrutura e atuação do 'espinho' do vírus. Estudos foram publicados nas revistas 'Nature' e 'Science' desta semana.

MMA apresenta projetos na área de educação ambiental em Cuiabá/MT

Seminário sobre gestão de resíduos orgânicos visa identificar obstáculos e propor soluções eficientes.

Templos de Bagan serão candidatos a Patrimônio da Humanidade

Autoridades iniciarão campanha para inscrever os templos de Bagan na lista de Patrimônio da Mundial da Humanidade.

Brasileiro descreve novo dinossauro que é 'primo' do Tiranossauro rex

Ancestral do lagarto predador foi encontrado na Venezuela. Batizado de 'Tachiraptor admirabilis', animal tinha até 2 metros de altura.

Risco de casos de ebola no Brasil é baixo, mas não chega a zero, diz secretário

A melhor maneira de prevenir casos de ebola no Brasil é ajudar a controlar a epidemia da doença nos países da África Ocidental.

China registra mais de 27 mil casos de dengue Cientistas usam fungo para criar inseticida contra o Aedes Aegypti

Pesquisa é feita no Norte do Rio em parceria com universidade em Londres. Grupo conseguiu resultado satisfatório com fungo encontrado na restinga.

Acidificação dos oceanos cresce 26% nos últimos 200 anos, diz relatório

Estudo destaca a gravidade e impacto do fenômeno nos próximos anos. Apenas redução das emissões de CO2 detém o problema, diz pesquisa.

Arte das cavernas já existia na Ásia há 40 mil anos, revela estudo

Descoberta contesta a tese aceita de que essa arte teria surgido na Europa. Pinturas foram encontradas nas cavernas na ilha Sulawesi, da Indonésia.

Pacto pela sustentabilidade faz cinco anos e envolve 160 empresas

As metas estão de acordo com o Plano de Produção e Consumo Sustentável do MMA.

Brasileiros criam método para estudar danos do Alzheimer ao cérebro

Cientistas recriam sintomas da doença em primatas em busca da cura. Animais foram testados no Canadá; pesquisa é de grupo da UFRJ.

Prefeitura de São Paulo recolhe 246 toneladas de 'santinhos'

Candidatos despejaram nas ruas material de campanha durante a madrugada de domingo (5).

MMA abre curso para elaboração de planos de resíduos sólidos

Podem participar técnicos das prefeituras de municípios de pequeno porte.

Trio ganha Nobel de Química de 2014 por avanço em microscopia

Dois americanos e um alemão desenvolveram técnicas de alta resolução. Inventos permitem observar moléculas dentro de células vivas.

Barco movido a energia solar é criado em Santa Catarina

A embarcação que usa energia solar, limpa e renovável vai ser utilizado para trabalhos de pesquisas, mobilização social e educação ambiental na Lagoa do Peri.

Fapesp divulga fraudes científicas e punições a pesquisadores

Fundação publicou lista com 5 casos de violações cometidas por bolsistas. Ação faz parte de processo de transparência da instituição paulista.

Cientistas criam vetor viral para fortalecer imunidade contra o câncer

Vírus modificado neutraliza proteína responsável pela atividade imunossupressora de linfócito, facilitando o ataque às células tumorais.

Nanotermômetro luminescente é desenvolvido por pesquisadores europeus

Dispositivo poderá ser utilizado para mapear a temperatura em nível molecular e auxiliar no tratamento de câncer.

Cachorro de enfermeira infectada com ebola na Espanha é morto

Cão representava 'possível risco de transmissão da doença para o homem'. Enfermeira é primeira pessoa contaminada com ebola fora da África.

Cidade dos EUA vai multar quem desperdiçar comida em casa

Governo de Seattle aprovou por unanimidade lei que aplicará multa nos cidadãos que encherem suas latas de lixo com mais de 10% de alimentos orgânicos.

Sabesp deveria ter diminuído captação do Cantareira, diz Ministério Público

O nível total dos reservatórios do Cantareira continua preocupante e chegou nesta quarta-feira (8) a 5,5% da capacidade. Há um ano, o nível era 39,8%.

Ebola continua se propagando e número de mortos chega a 3.879

Segundo balanço mais recente, foram 8.033 infectados na África Ocidental. De acordo com OMS, não há evidência de que epidemia esteja sob controle.

Estudo indica custo de iscas de botos e jacarés usados para a pesca da piracatinga

Muito embora não seja a isca mais utilizada, um boto pode custar entre 200 e 300 reais, sendo a de maior valor. Entre os jacarés, a de maior valor é do espécime com mais de quatro metros, que tem seu preço variável entre 80 e 150 reais.

Horário de verão começa no próximo dia 19

A medida, adotada para economizar energia no horário de maior consumo, vai até o dia 22 de fevereiro de 2015.

Governo cria grupo para definir ajuda a países da África atingidos pelo ebola

Ainda não se sabe o investimento destinado à região afetada pela epidemia. Saúde, Defesa, o Itamaraty e a Secretaria da Presidência debatem tema.

Astronautas fazem caminhadas espaciais para fazer reparos na ISS

Alemão e americano vão passar mais de seis horas em caminhada orbital. Última etapa de reparos na Estação Espacial acontece em 15 de outubro.

Meteorologistas detectam o maior tufão registrado em 2014

A tempestade Vongfong deve atingir o Japão neste final de semana.

País discute ocupação sustentável do bioma marinho

Dinâmica das águas no oceano torna impossível a limitação de determinados territórios.

Pesquisa mostra que 40% têm lembranças da 'vida após a morte'

Maior estudo sobre o tema já feito investigou casos de pacientes que relataram memórias do período entre parada cardíaca e reanimação.

Ato tenta evitar sacrifício do cachorro da espanhola contaminada pelo ebola

Um grupo de 100 pessoas, se concentrou nesta terça-feira (7) em frente ao edifício onde vive a auxiliar de enfermagem contaminada pelo vírus ebola, para pedir que as autoridades de Madri não sacrifiquem o cachorro da família, Excalibur, como medida preventiva.

Bill Gates lança financiamento de R\$ 11 mi para pesquisas brasileiras

Bilionário americano irá apoiar estudos inovadores em desenvolvimento infantil no Brasil.

Aos 30 anos, 1º bebê de proveta do Brasil diz não ter pressa para ter filhos

Anna Paula nasceu de uma fertilização in vitro, em outubro de 1984. Jovem é formada em nutrição e faz aniversário nesta terça-feira (7).

Eclipse lunar total acontece no início da manhã desta quarta-feira

Fenômeno poderá ser visto principalmente no oeste do país. 'Lua de sangue' ocorre quando Terra impede luz solar de chegar à Lua.

Sacolinhas plásticas voltam a ser proibidas nos supermercados de São Paulo

O Tribunal de Justiça de São Paulo julgou improcedente uma ação movida pelo Sindicato da Indústria de Material Plástico do Estado de São Paulo que questionava uma lei de 2011, aprovada pela Câmara Municipal de São Paulo, que proíbe a distribuição das sacolinhas plásticas pelos supermercados paulistanos.

Japão lança ao espaço novo satélite meteorológico Himawari-8

Aparelho vai monitorar e prever desastres naturais. Himawari-8 é capaz de registrar imagens da superfície a cada 10 minutos.

Nobel da Medicina diz que restrições migratórias prejudicam a ciência

O cientista americano John O'Keefe, que trabalha no University College de Londres, disse que o atual sistema "é um obstáculo muito grande" na hora de contratar novos cientistas e que as proibições de investigar com animais são um problema.

Justica derruba liminar que suspendia licenciamento da Usina São Manoel

A Hidrelétrica São Manoel deve ser construída no Rio Teles Pires, em Mato Grosso, terá potência de 700 megawatts. O início da geração de energia está previsto para 2018.

Pesquisa do Nobel de Física é de ampla aplicação no cotidiano

Trio ganhador viabilizou o uso de lâmpadas LED para iluminação. Tecnologia é mais econômica e mais durável que lâmpada convencional.

Vírus do ebola pode sobreviver no sêmen por 90 dias, diz OMS

Sobreviventes devem ser orientados a usar camisinha nesse período. Ebola é transmitido por fluidos corporais, principalmente sangue e saliva.

MP quer preservar água do Cantareira para 2015, diz especialista da Unicamp

O volume útil do Cantareira acabou em maio e, desde então, a água vem sendo bombeada da reserva técnica, o chamado volume morto. A Sabesp quer agora captar ainda mais água, utilizando a segunda cota dessa reserva, o que aumentaria em 10,7% a capacidade do Cantar

Mundo está fracassando nas metas para 2020 de proteção da natureza

Dados são de relatório da ONU divulgado nesta segunda. Governos aumentaram esforço, mas isso não será suficiente para metas.

Navio oceanográfico Ary Rongel deixa o Rio com destino à Antártica

Os navios farão escalas nos portos de Rio Grande (RS); em Ushuaia, na Argentina; Punta Arenas, no Chile; Montevideu, no Uruguai; e Buenos Aires, na Argentina, para dar continuidade às ações de suporte ao Proantar.

Conferência sobre diversidade biológica tem início na Coreia

Em debate, novas medidas destinadas a proteger a biodiversidade.

Nasa anuncia que águas profundas dos oceanos pararam de esquentar

Uma das principais hipóteses apresentadas até agora para explicar este paradoxo é que o calor acumulado pelos oceanos desceu a grandes profundidades.

Chuva eleva nível dos rios e deixa cidades de AL em estado de atenção

União, Laje, Viçosa, Branquinha, Murici e Maceió estão sendo monitoradas. Defesa Civil diz que também há monitoramento dos rios na Zona da Mata.

Instituto Akatu lança campanha pelo consumo consciente e transformador

No dia 15 de outubro será comemorado o Dia do Consumo Consciente. Para marcar o mês, o Instituto Akatu lançou a Campanha #SigaOs10Caminhos, que lista dez valores necessários para tornar mais sustentável a produção de bens e o consumo.

Garis recolhem 350 toneladas de lixo eleitoral no Rio

A limpeza das ruas do Rio começou com a votação. Desde o início foram recolhidos, entre as 22h e as 6h, cartazes, placas e outras peças colocadas nas vias públicas de forma irregular.

Barco encontrado em frente à costa do Haiti não é o 'Santa Maria'

Especialistas da Unesco analisaram embarcação encontrada no país. Caravela foi uma das três usadas no Descobrimento da América em 1492.

Europa confirma 1º caso de contágio por ebola fora da África

Enfermeira da Espanha foi contaminada com o vírus após tratar uma pessoa diagnosticada com ebola em Madri.

Carcça de baleia é retirada da Praia de Camburi, em Vitória/ES

Operação foi montada pela prefeitura e órgãos ambientais para o serviço. Baleia foi encontrada morta na manhã de domingo (5).

Estudo do Nobel pode levar a terapias para doenças que afetam orientação

Nobel de Medicina de 2014 foi para descoberta de 'GPS do cérebro'. Conhecimento pode ajudar em doenças que afetam a orientação espacial.

Nível de água do Cantareira tem nova baixa

O volume de água do Sistema Cantareira, o principal manancial de abastecimento de São Paulo, teve nova baixa nesta segunda-feira

(6), com o nível passando de 6% para 5,8%, o menor de toda a história.

Obama diz que riscos de epidemia de ebola nos EUA são baixos

EUA deverão verificar se passageiros estão contaminados com o vírus. Obama diz que aumentará pressão para 'países grandes' ajudar a África.

Projeto Tamar protege 2 milhões de tartarquinhas em oito estados

Cuidados ocorrem nas épocas e áreas de alimentação, desova, crescimento e descanso no litoral.

Estudo reverte perda de memória em pacientes com Alzheimer

Pesquisa da Universidade da Califórnia é a primeira a sugerir que a perda de memória em pacientes com a condição pode ser revertida.

Nasce primeiro bebê de útero transplantado

Esse importante progresso na luta contra a infertilidade permitiu à mulher, que nasceu sem útero, dar à luz um menino saudável, em setembro, após 31 semanas de gestação.

Cientistas veem alto risco de ebola chegar à França e ao Reino Unido

Doença pode chegar aos dois países até o fim de outubro. Estimativa considera tráfego aéreo operando em plena capacidade.

Ministério quer adotar quina eletrônica para transporte de animais em seis meses

A quina é o documento oficial para transporte interestadual de animais, ovos férteis e material de multiplicação.

Instituto Mamirauá disponibiliza jogos didáticos de Educação Ambiental

Os jogos, construídos pela equipe de Educação Ambiental com apoio dos Programas de Manejo Florestal Comunitário e o de Manejo de Agroecossistemas, estão agora disponíveis para download gratuito no site da instituição.

Manta de LED melhora performance de atletas e pode ajudar no tratamento de obesidade

Protótipo desenvolvido por pesquisadores da UFSCar e da USP de São Carlos deve chegar ao mercado até o fim do ano, podendo auxiliar no treinamento esportivo e na reabilitação de pacientes.

Identificadas 700 variações genéticas ligadas à altura

Foram identificadas 697 variantes genéticas em mais de 400 regiões do genoma ligadas à estatura, ou seja, o triplo do que se conhecia até o momento.

Instituto de pesquisa na Unicamp abre ambulatório de aconselhamento genômico

Pacientes fazem exame que identifica predisposições genéticas a doenças, antecipando medidas de prevenção e tratamento.

Corpo de baleia jubarte é encontrado em praia de Vitória/ES

Segundo especialistas, animal pode explodir a qualquer momento. Retirada do bicho pode danificar parte da orla da Praia de Camburi.

Peru registra sétimo caso importado de febre chicungunha

Em nível nacional, o Peru se encontra desde o último domingo em estado de emergência pelo "risco elevado de entrada da chicungunha no território" peruano.

Tufão Phanfone chega ao centro do Japão

Phanfone chega acompanhado por ventos de até 198 km/h. Ao menos 608 voos foram afetados na manhã desta segunda-feira (6).

Nível do Cantareira cai e uso de nova cota do volume morto não está previsto

O volume de água do Cantareira voltou a cair na sexta-feira (3), de 6,6% para 6,4% da capacidade de operação e deve continuar em queda, porque não há previsão de chuvas significativas para os próximos dias na região onde ficam as nascentes que alimentam os reservatórios do sistema.

Global Innovation Initiative oferece apoio a pesquisadores brasileiros

Estados Unidos e Reino Unido concederão bolsas de até R\$ 570 mil para projetos conjuntos entre universidades desses países e do Brasil.

Professores darão aulas em laboratório submerso em defesa dos oceanos

Dois professores dos Estados Unidos habitarão por 73 dias um laboratório submarino, de onde darão aulas pela internet para chamar a atenção sobre a preservação dos oceanos, ao mesmo tempo em que tentarão bater um recorde de permanência debaixo d'água.

10 cidades brasileiras concorrem a "Capital Nacional da Hora do Planeta"

Os participantes da segunda edição do Desafio são: Belo Horizonte e Betim (MG), Campo Grande (MS), Fortaleza (CE), Maceió (AL), Manaus (AM), Porto Alegre (RS), Recife (PE), Rio de Janeiro (RJ) e São Paulo (SP).

Vulcão em erupção no Japão deixa 47 mortos e 16 desaparecidos

O vulcão começou a expelir fumaça, rochas incandescentes e cinzas na madrugada de sábado (27), de acordo com a agência meteorológica do país.

Bactéria pode ter sistema imune rudimentar, indica estudo

Salmonella enterica produz proteína semelhante à macroglobulina, que exerce papel-chave no sistema imunológico humano; artigo foi publicado na Nature Communications.

Arqueólogos turcos dizem que acharam masmorras de Drácula

"É difícil estimar em que sala de Drácula foi mantido", disse o especialista. "Mas ele estava por aqui", continuou.

Atividade humana ameaça jazida de pegadas pré-históricas na Bolívia

Administradora diz que exploração de calcário em pedreira afeta o local. Maior jazida paleontológica do mundo tem mais de 5 mil pegadas.

Aids surgiu no Congo nos anos 20, concluem investigadores

Pesquisadores reconstituíram o caminho e mutação do vírus. HIV é responsável pela morte de 36 milhões de pessoas no mundo.

Mortos por ebola na África Ocidental chegam a 3.439, segundo OMS

Total de infectados é de 7.492, de acordo com mais recente balanço. Só na Libéria, houve 3.834 infecções e 2.069 mortos.

Novo aplicativo premia quem dá ou pega carona

A ferramenta, disponível para Apple e Android. A ferramenta, disponível para Apple e Android.

Noruega pagará US\$ 150 milhões para manter floresta em pé na Libéria

Apesar de não ter uma área florestada tão grande, a Libéria abriga espécies à beira da extinção, como chimpanzés, elefantes e leopardos. Para garantir a sobrevivência desses animais é imprescindível frear o desmatamento e criar reservas que garantam a proteção integral da fauna e flora.

Projeto em terras indígenas ajuda controle do desmatamento

Chamada pública para Planos de Gestão Territorial e Ambiental em Terras Indígenas está aberta até 21 de novembro.

Cientistas desvendam 'motor' do guepardo, a 'Ferrari' do mundo animal

Mamífero terrestre mais rápido, guepardo usa relativamente pouca energia. População de guepardos caiu de 100 mil para 10 mil no último século.

29 / 09 / 2014 Estudo diz que curry pode ajudar cérebro a se regenerar

Pesquisa alimenta esperanças na luta contra Alzheimer. Molho indiano teria estimulado células nervosas em ratos.

29 / 09 / 2014 Cientistas descobrem 'interruptor' que atua em envelhecimento celular

Enzima que prolonga capacidade da célula de se dividir 'liga' e 'desliga'. Compreensão pode levar a tratamento de doenças do envelhecimento.

29 / 09 / 2014 Após um dia estável, nível do Cantareira volta a cair e chega a 7,1%

No sábado, o sistema conseguiu ficar estável, em decorrência das chuvas, e manteve o mesmo nível da sexta-feira (7,2%). A água que está sendo retirada do reservatório pertence à primeira cota do volume morto.

29 / 09 / 2014 Rússia lança com sucesso foguete Proton-M após acidente

Foguete transporta um satélite de comunicações russo. Equipamento semelhante caiu após decolagem em maio.

29 / 09 / 2014 Unidades de conservação terão recursos para projetos coletivos

Serão beneficiadas famílias do Acre, Amazonas, Pará, Rondônia, Amapá, Maranhão e Tocantins.

29 / 09 / 2014 Fazenda vertical é solução para desafios enfrentados pela agricultura

Escassez de áreas cultiváveis e aquecimento global abrem espaço para o cultivo de vegetais em estufas, dentro de prédios. Modelo

aproxima produção do mercado consumidor e economiza água, mas ainda é muito caro.

29 / 09 / 2014 [Japão retoma operações de resgate no vulcão Ontake](#)

O governo japonês confirmou a morte de 4 pessoas, mas outras 27 pessoas foram resgatadas inconscientes.

29 / 09 / 2014 [Confirmada descoberta de nova espécie de rã laranja fluorescente no Panamá](#)

Os autores da descoberta recomendam uma conservação especial que garanta sua sobrevivência já que esta nova espécie de rã "parece ser encontrada apenas em uma área muito pequena".

29 / 09 / 2014 [Rachel vira furacão e leva chuvas a região mexicana castigada por Odile](#)

A passagem do furacão Odile - de categoria 3 - deixou seis mortos e centenas de desabrigados em Los Cabos, onde os danos em hotéis e estabelecimentos comerciais são estimados em cerca de 1 bilhão de dólares.

29 / 09 / 2014 [Projeto viabiliza estudo sobre repartição de benefícios genéticos](#)

A proteção da biodiversidade e a repartição dos benefícios decorrentes do acesso ao patrimônio genético e conhecimentos tradicionais associados foram objeto de estudo realizado pela União para o Biocomércio Ético e pela Corporação Financeira Internacional (IFC, todos na sigla em inglês), ligada ao Banco Mundial.

29 / 09 / 2014 [Projeto para índios e comunidades tradicionais seleciona instituição até o dia 3](#)

Banco Mundial financia ações visando reduzir os processos de desmatamento.

29 / 09 / 2014 [Água de cava de argila que abastece Cordeirópolis é potável, relata Unesp](#)

Químico pesquisou teor de cobre, alumínio, zinco e chumbo e a alcalinidade. Cidade enfrenta, desde o mês de agosto, racionamento de 12 horas por dia.

29 / 09 / 2014 [Peru exhibe manto pré-inca de 2 mil anos com estampas tridimensionais](#)

Manto Calendário é um dos têxteis arqueológicos mais importantes. Peça tinha sido vendida ilegalmente para Suécia e foi devolvida em junho.

29 / 09 / 2014 [Crianças marcham no Chile para pedir proteção de geleiras](#)

A denominada "Supermarcha Familiar", que percorreu vários quarteirões da Alameda Bernardo O'Higgins, a principal avenida da capital chilena, até chegar ao Palácio de la Moneda, sede do Executivo, responde a uma iniciativa da filial chilena do Greenpeace, que há vários meses procura sensibilizar às autoridades sobre este tema.

30 / 09 / 2014 [Bob Dylan motiva aposta entre cientistas que citam letras em artigos](#)

Grupo de pesquisadores na Suécia usa versos em textos acadêmicos. Segundo 'Guardian', disputa vale almoço em restaurante de Estocolmo.

30 / 09 / 2014 [Arábia Saudita projeta bairro do futuro exclusivo para pedestres](#)

O intuito do projeto é ter uma cidade mais humana, com estruturas que promovam a interação social. O intuito do projeto é ter uma cidade mais humana, com estruturas que promovam a interação social.

30 / 09 / 2014 [Pnuma: destruição de manguezais é até cinco vezes maior que das florestas](#)

Os manguezais são encontrados em 123 países e cobrem uma área de 152 mil km². Mais de 100 milhões de pessoas vivem a uma distância de 10 km dessas regiões e se beneficiam de seus recursos.

30 / 09 / 2014 [Cidades adotam a política de menos carros e mais bikes](#)

O automóvel particular, o grande vilão da história, aos poucos vai perdendo espaço para a simpática mocinha magrela, a bicicleta.

30 / 09 / 2014 [Pesquisa: 7% dos pacientes com câncer deixam tratamento por efeito colateral](#)

Os cânceres com maior taxa de interrupção de tratamento neste estudo coincidiram com os mais prevalentes. Assim, entre os cinco países, 22% dos que deixaram o tratamento tinham um tumor de mama; 14% um câncer colorretal e 13% câncer de pulmão de não pequenas células.

30 / 09 / 2014 [Sobe para dez número de mortos em erupção de vulcão no Japão](#)

O vulcão – segundo maior do país, com 3.067 metros de altura – começou a expelir fumaça, cinzas e rochas na madrugada de sábado, deixando cerca de 40 pessoas feridas com diferentes graus de queimaduras e lesões causadas pela queda.

30 / 09 / 2014 [Estudantes filmam briga que levou à morte de tigre em zoo do Canadá](#)

Incidente ocorreu no Assiniboine Park Zoo, em Winnipeg, no Canadá. Escola ofereceu serviço de aconselhamento a alunos que viram

cena.

30 / 09 / 2014 Sistema de Alimentação Sustentável é lançado por agências das Nações Unidas

A produção de alimentos depende da proteção ambiental, já que somente com recursos naturais saudáveis e em abundância, como água, por exemplo, é possível assegurar o cultivo agrícola.

30 / 09 / 2014 Cientistas enfrentam dilema ético na busca por vacinas contra o ebola

Normalmente são necessários anos para provar que nova vacina é segura. Para o ebola, cientistas estão dispensando parte dos testes corriqueiros.

30 / 09 / 2014 Terra perdeu mais de metade da fauna selvagem que existia há 40 anos

A principal conclusão do relatório "Planeta Vivo" do Fundo Mundial para a Natureza, é que as populações de peixes, aves, mamíferos, anfíbios e répteis decaiu em 52% desde 1970.

30 / 09 / 2014 Chile torna-se primeiro sul-americano a taxar carbono

Imposto sobre o carbono no Chile tem como alvo o setor de energia, particularmente geradoras que operam usinas térmicas.

30 / 09 / 2014 Energia solar ilumina exposição Às Margens do Rio Pinheiros, em SP

As intervenções urbanas do artista paulistano Eduardo Srur que fazem parte da exposição "Às Margens do Rio Pinheiros", na capital paulista, contam com uma importante aliada: a energia solar.

30 / 09 / 2014 Grande Barreira de Corais da Austrália luta para recuperar seu esplendor

A Grande Barreira de Corais, situada na costa nordeste da Austrália, pretende recuperar todo seu esplendor até 2050 por meio de um plano para limpar as águas de suas bacia e erradicar a praga de estrelas que se alimentam de seus corais.

30 / 09 / 2014 Munique planeja ter 100% de energia limpa até 2025

A Alemanha é um dos países mais avançados no mundo em iniciativas e desenvolvimento de tecnologias alternativas.

30 / 09 / 2014 Estudo culpa aquecimento global por eventos climáticos extremos de 2013

Cientistas avaliaram 16 casos de extremos climáticos em 2013. Mudanças climáticas aumentaram risco de 9 desses eventos ocorrerem.

01 / 10 / 2014 Oiapoque e Feira de Santana têm suspeita de mais de 800 casos de chikungunya

A febre chikungunya é parecida com a dengue e tem os mesmos sintomas: febre, dores nas articulações, mal-estar.

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Mortality experience among Minnesota taconite mining industry workers
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Pier Luigi Bragato and Monica Sukan

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Sven Egenhoff and Neil Fishman

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J. Freeman Gilbert

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Cliff Stanley

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EARTH PAGES

Signs of lunar tectonics

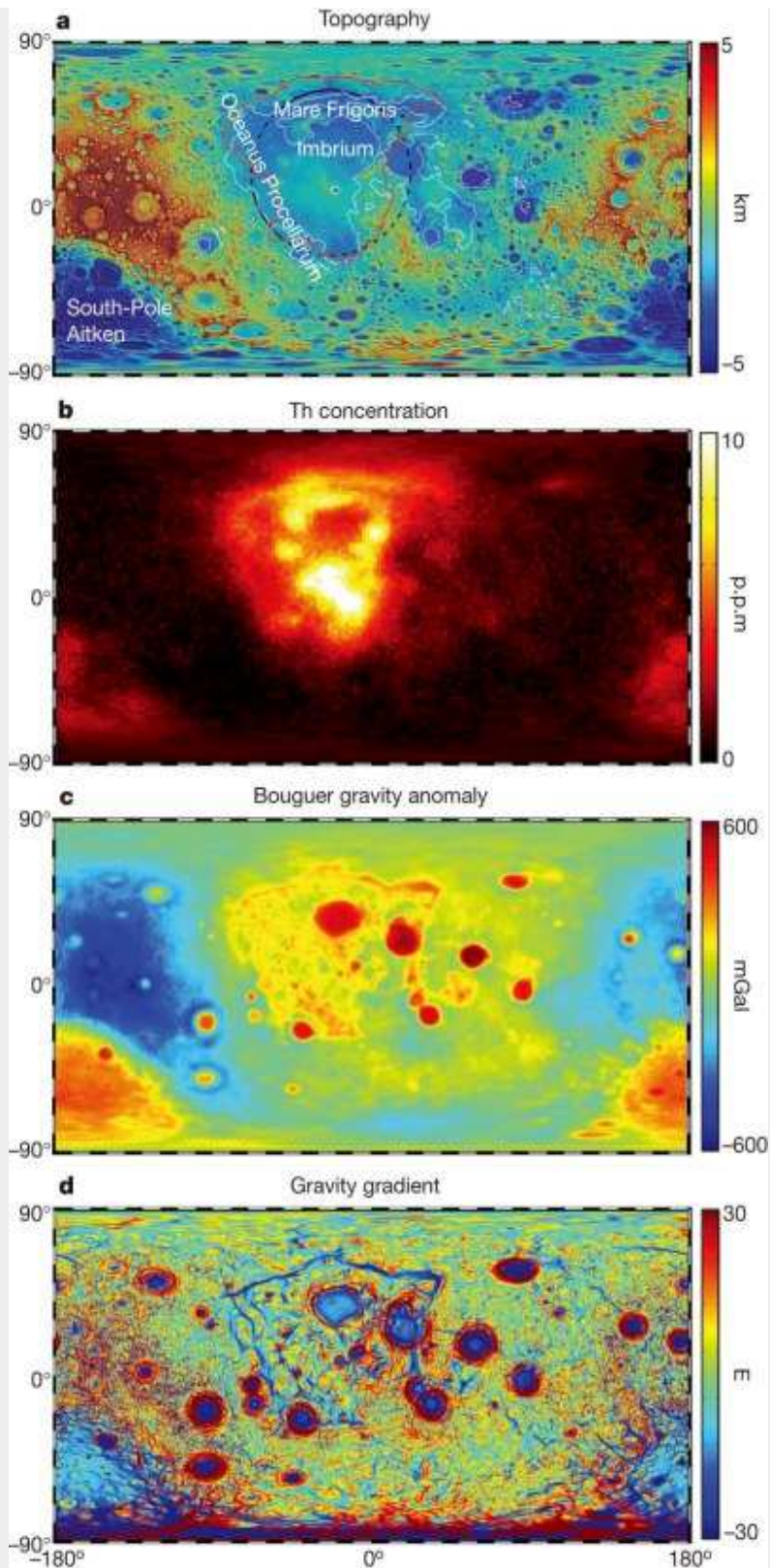
Posted on [October 4, 2014](#) by [Steve Drury](#) | [Leave a comment](#)

Large features on the near side of the Moon give us the illusion of the Man-in-the-Moon gazing down benevolently once a month. The lightest parts are the ancient lunar highlands made from feldspar-rich anorthosite, hence their high albedo. The dark components, originally thought to be seas or *maria*, are now known to be large areas of flood basalt formed about half a billion years after the Moon's origin. Some show signs of a circular structure and have been assigned to the magmatic aftermath of truly gigantic impacts during the 4.1–3.8 Ga [Late Heavy Bombardment](#). The largest *mare* feature, with a diameter of 3200 km, is [Oceanus Procellarum](#), which has a more irregular shape, though it envelopes some smaller *maria* with partially circular outlines.



Full Moon viewed from Earth. Oceanus Procellarum is the large, irregular dark feature at left. (credit: Wikipedia)

A key line of investigation to improve knowledge of the lunar *maria* is the structure of the Moon's gravitational field above them. Obviously, this can only be achieved by an orbiting experiment, and in early 2012 NASA launched one to provide detailed gravitational information: the [Gravity Recovery and Interior Laboratory \(GRAIL\)](#) whose early results were summarised by [EPN in December 2012](#). GRAIL used two satellites orbiting in a tandem configuration similar to the US-German [Gravity Recovery and Climate Experiment \(GRACE\)](#) launched in 2002 to measure variations over time in the Earth's gravity field. The Grail orbiters flew in a low orbit and eventually crashed into the Moon in December 2012, after producing lots of data whose processing continues. The latest finding from GRAIL concerns the gravity structure of the Procellarum region (Andrews-Hanna, J.C. and 13 others 2014. Structure and evolution of the lunar Procellarum region as revealed by GRAIL gravity data. *Nature*, v. **514**, p. 68-71) have yielded a major surprise. Instead of a system of anomalies combining circular arcs, as might be expected from a product of major impacts, the basaltic basin has a border made up of many linear segments that define an unusually angular structure.



The topography and gravity structure of the Moon. Oceanus Procellarum is roughly at the centre. Note: the images cover both near- and far side of the Moon. (credit: Andrews-Hanna et al 2014)

The features only become apparent from the gravity data after they have been converted to the first derivative of the Bouguer anomaly (its gradient). Interpreting the features has to explain the angularity, which looks far more like an outcome of tectonics than bombardments. The features have been explained as rift structures through which basaltic magma oozed to the surface, perhaps feeding the vast outpourings of *mare* basalts, unusually rich in potassium (K), rare-earth elements (REE) and phosphorus (P) known as KREEP

basalts. The Procellarum polygonal structure encompasses those parts of the lunar surface that are richest in the radioactive isotopes of potassium, thorium and uranium (measured from orbit by a gamma-ray spectrometer) – thorium concentration is shown in the figure. Tectonics there may be on the Moon, but the authors are not suggesting platetectonics but rather structures formed as a huge mass of radioactively heated lunar lithosphere cooled down at a faster rate than the rest of the outer Moon. Nor are they casting doubt on the Late Heavy Bombardment, for there is no escaping the presence of both topographic and gravity-defined circular features, just that the biggest expanse of basaltic surface on the Moon may have erupted for other reasons than a huge impact.

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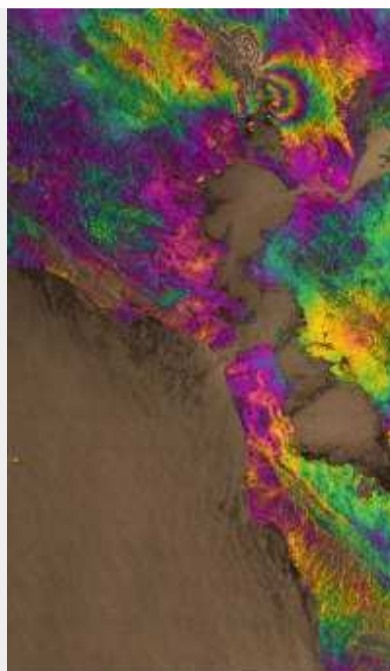
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Earthquakes and radar interferometry

Posted on [October 4, 2014](#) by [Steve Drury](#) | [Leave a comment](#)

A friend recently moved to the [Napa Valley](#) in California, almost certainly motivated by the vast area given over to the grape and the quality of Napa wines. Shortly after the flit, in the middle of some minor refurbishment, he had quite a shock; a Magnitude 6.0 earthquake at 3:20 a.m. local time on 24 August, the worst in northern California for 25 years. My friend lives only 15 km from the epicentre in South Napa, but his house was undamaged. His confidence in the move remains unshaken, however, as there was no effect on this year's grape harvest.

The event was monitored by the European Space Agency's Sentinel-1A high-resolution radar satellite that entered orbit in April 2014. Sentinel revisits any area on the ground every 12 days, has all-weather/day-night imaging capacity, a 250 km-wide image swath with 10 m spatial resolution and is designed to analyse ground movements using interferometry between radar data before and after events. Interferometric radar imaging or [InSAR](#) relies on changes in the phase of radar waves between two dates of 'illumination' of the ground – radar images normally use only the amplitude of a radar wave, ignoring its phase – and potentially can measure shifts in ground elevation of the order of centimetres.



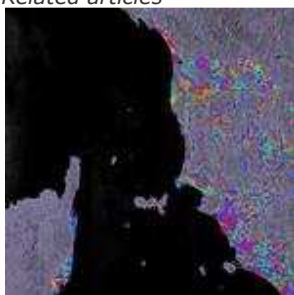
Interferometric Sentinel-1A [radar image](#) of the area around San Francisco showing the ground movement for the period before and after the Napa Valley earthquake (NE corner) of 24 August 2014 (credit: ESA)

The image records ground movement in small steps of elevation that are assigned colours, the sequence blue-green-yellow-red-magenta spans a ground shift of about 3 cm. If several of these 'fringes' are closely spaced over relatively small areas this is due to significant motions locally. Broad areas with little change in colour have barely moved in the period between the dates of the two images.

The epicentre of the South Napa earthquake clearly shows up at the NE corner of the image, like half a 'bull's eye'. A closer look at the enlarged image (click on the image) shows two such features sharply bounded to the west by a line: that coincides with the West Napa Fault.

My friend lives to the west of the faults where the broad areas of colour signify much smaller motions than in the main affected area. He woke and left the building thinking this was a foreshock of a much more destructive event, and had an anxious few days. The United States Geological Survey estimated that during the main 'quake 15,000 people experienced severe shaking, 106,000 people felt very strong shaking, 176,000 felt strong shaking, and 738,000 felt moderate shaking. But there was only one fatality and 13 hospitalised casualties.

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This month's stunning image from Earth Science

Picture of the Day, taken on 8 September this year is of [Iceland's biggest fissure eruption \(video clip\)](#) since 1875, in the [Holuhraun lava field](#), which began on 31 August this year. The flow is about to meet the Jokulsa a Fjollum, a large river flowing from Iceland's largest ice cap [Vatnajokull](#). At the time of writing (29 September) lava is flowing along the river bed at around 1 km each day. So far, the flow has

spread over 44 square kilometres, and risks blocking the Jokulsá a Fjöllum where it flows through a narrow channel bounded by older lava flows. If that happens the river will form a substantial lake until it is able to flow over and erode the bedrock, and will also leave one of the country's spectacular waterfalls (Selfoss) dry.



Aerial View of Jökulsá á Fjöllum, Iceland, downstream of Holuhraun (credit: Wikipedia)

The fissure is connected to the large [Bárðarbunga](#) stratovolcano that lies beneath Vatnajökull, which is currently showing signs of subsidence, at about 40 cm each day, and seismicity. There are concerns that this activity may presage an eruption there which may melt large volumes of ice and perhaps release a flood or [jökulhlaup](#) from beneath the icecap. Such a flood would likely follow the course of the Jokulsá a Fjöllum river.

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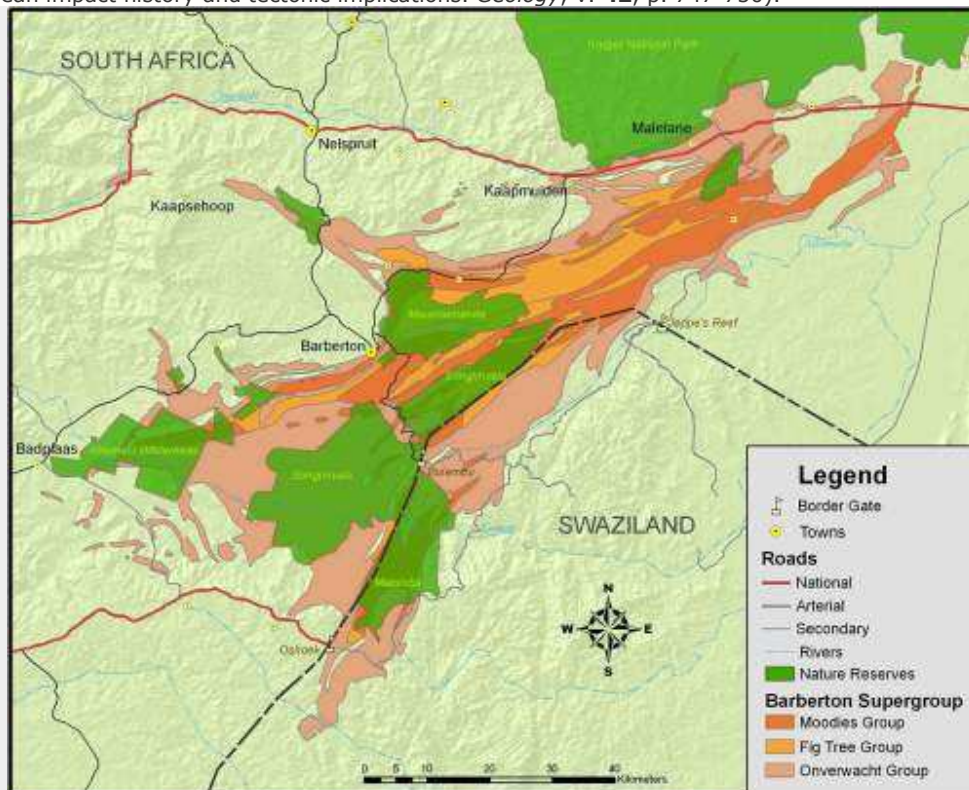
Posted on [September 29, 2014](#) by [Steve Drury](#) in [Environmental geology and geohazards](#), [Geochemistry, mineralogy, petrology and volcanology](#)

Tagged [Bárðarbunga](#), [Iceland](#), [Jökulhlaup](#), [Lava](#), [Volcanic eruption](#), [Volcanic hazard](#)

Newly discovered signs of Archaean giant impacts

Posted on [September 20, 2014](#) by [Steve Drury](#) | [Leave a comment](#)

It is barely credible that only two decades ago geoscientists who argued that extraterrestrial impacts had once had an important role in Earth history met with scorn from many of their peers; slightly mad, even bad and perhaps dangerous to know. Yet clear evidence for impacts has grown steadily, especially in the time before 2.5 billion years ago known as the Archaean (see *EPN* for [March 2003](#), [April 2005](#), [July 2012](#), [May 2014](#)). Even in the 1990s, when it should have been clear from the golden years of lunar exploration that our neighbour had been battered at the outset of the Archaean, claims for terrestrial evidence of the tail-end of that cataclysmic event were eyed askance. Now, one of the pioneer researchers into the oldest terrestrial impacts, Don Lowe of Stanford University, California has, with two colleagues, reported finds of yet more impact-related spherule beds from the famous Archaean repository of the Barberton Mountains in South Africa (Lowe, D.R. *et al.* 2014. Recently discovered 3.42-3.23 Ga impact layers, Barberton Belt, South Africa: 3.8 Ga detrital zircons, Archaean impact history and tectonic implications. *Geology*, v. **42**, p. 747-750).




Barberton greenstone belt, South Africa (credit: Barberton World Heritage Site)

Like four other such layers at Barberton, those newly described contain several types of spherules, degraded to microcrystalline alteration products of the original glasses. Some of them contain clear evidence of originally molten droplets having welded together on deposition. Their contrasted geochemistry reveals target rocks ranging in composition from well-sorted quartz sands to intermediate, mafic and ultramafic igneous rocks. Some beds are overlain by chaotic deposits familiar from more recent times as products of tsunamis, with signs that the spherules themselves had been picked up and transported.

Dated by their stratigraphic relations to local felsic igneous rocks, the spherule beds arrived in pulses over a period of about 240 Ma between 3.42 to 3.23 Ga. Even more interesting, the overlying tsunami beds have yielded transported zircons that extend back to 3.8 Ga spanning the Archaean history of the Kaapvaal craton of which the Barberton greenstone belt rests and indeed that of many Eoarchaean cratons; the Earth's oldest tangible continental crust. The zircons may reflect the depth to which the impacts penetrated, possibly the base of the continental crust. It isn't easy to judge the size of the responsible impactors from the available

evidence, but Lowe and colleagues suggest that they were much larger than that which closed the Mesozoic at the Cretaceous-Palaeogene boundary; perhaps of the order of 20-70 km across. So, although the late, heavy bombardment of the Moon seems to have closed at around 3.8 Ga, from evidence yielded by the [Apollo programme](#), until at least half a billion years later large objects continued to hit the Earth more often than expected from the lunar record. Lowe has suggested that this tail-end of major bombardment on Earth may eventually have triggered the onset of plate tectonics as we know it now.

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Ants and carbon sequestration

Posted on [September 20, 2014](#) by [Steve Drury](#) | [1 comment](#)

Aside from a swift but highly unlikely abandonment of fossil fuels, reduction of greenhouse warming depends to a large extent, possibly entirely, on somehow removing CO₂ from the atmosphere. Currently the most researched approach is simply pumping emissions into underground storage in gas permeable rock, but an important target is incorporating anthropogenic carbon in carbonate minerals through chemical interaction with potentially reactive rocks. In a sense this is a quest to exploit equilibria involving carbon compounds that dominate natural [chemical weathering](#) and to sequester CO₂ in solid, stable minerals.

The two most likely minerals to participate readily in weathering that involves CO₂ dissolved in water are [plagioclase feldspar](#), a calcium-rich aluminosilicate and olivine, a magnesium silicate. Both are abundant in mafic and [ultramafic rocks](#), such as basalt and peridotite, which themselves are among the most common rocks exposed at the Earth's surface. The two minerals, being anhydrous, are especially prone to weathering reactions involving acid waters that contain hydrogen ions, and in the presence of CO₂ they yield stable carbonates of calcium and magnesium respectively. Despite lots of exposed basalts and ultramafic rocks, clearly such natural sequestration is incapable of absorbing emissions as fast as they are produced.

One means of speeding up weathering is to grind up plagioclase- and olivine-bearing rocks and spread the resulting gravel over large areas; as particles become smaller their surface area exposed to weathering increases. Yet it doesn't take much pondering to realise that a great deal of energy would be needed to produce sufficient Ca- and Mg-rich gravel to take up the approximately 10 billion tonnes of CO₂ being released each year by burning fossil fuels: though quick by geological standards the reaction rates involved are painfully slow in the sense of what the climatic future threatens to do. So is there any way in which these reactions might be speeded up?

Two biological agencies are known to accelerate chemical weathering, or are suspected to do so: plant roots and animals that live in soil. Ronald Dorn of Arizona State University set out to investigate the extent to which such agencies do [sequester carbon](#) dioxide, under the semi-arid conditions that prevail in Arizona and Texas (Dorn, R.I. 2014. Ants as a powerful biotic agent of olivine and plagioclase dissolution. *Geology*, v. **42**, p. 771-774). His was such a simple experiment that it is a wonder it had not been conducted long ago; but it actually took more than half his working life. Spaced over a range of topographic elevations, Dorn used an augur at each site to drill five half-metre holes into the root mats of native trees, established ant and termite colonies and bare soil surfaces free of vegetation or animal colonies, filling each with sand-sized crushed basalt.



Film poster for Empire of the Ants (starring Joan Collins) (credit: Wikipedia)

Every five years thereafter he extracted the basalt sand from one of the holes at each site and each soil environment. To assess how much dissolution had occurred he checked for changes in porosity, and heated the samples to temperatures where carbonates break down to discover how much carbonate had been deposited. That way he was able to assess the cumulative changes over a 25 year period relative to the bare-ground control sites. The results are startling: root mats achieved 11 to 49 times more dissolution than the control; termites somewhat less, at 10 to 19 times; while ants achieved 53 to 177 times more dissolution. While it was certain that the samples had been continuously exposed to root mats throughout, the degree of exposure to termites and ants is unknown, so the animal enhancements of dissolution are probably minima.

Microscopic examination of mineral grains exposed to ant activity shows clear signs of surface pitting and other kinds of decay. Chemically, the samples showed that exposure to ants consistently increased levels of carbonate in the crushed basalt sand compared with controls, with levels rising by 2 to 4% by mass, with some variation according to ant species. Clearly, there is some scope for a role for ants in carbon sequestration and storage; after all, there are estimated to be around 10^{13} to 10^{16} individual ants living in the world's soils. In the humid tropics the total mass of ants may be up to 4 times greater than all mammals, reptiles and amphibians combined. There is more to learn, but probably a mix of acid secretions and bioturbation by ants and termites is involved in their dramatic effect on weathering. One interesting speculation is that ants may even have played a role in global cooling through the Cenozoic, having evolved around 100 Ma ago.

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Arabia : staging post for human migrations?

Posted on [September 11, 2014](#) by [Steve Drury](#) | [2 comments](#)



The Arabian Peninsula from the SeaWiFS satellite (credit: Wikipedia)

From time to time between 130 and 75 ka fully modern humans entered the Levant from Africa, which is backed up by actual fossils. But up to about 2010 most palaeoanthropologists believed that they moved no further, because of the growth of surrounding deserts, and probably did not return to the Middle East until around 45 ka. The consensus for the decisive move out of Africa to Eurasia centred on crossings of the Straits of [Bab el Mandab](#) at the entrance to the Red Sea, when sea level fell to a level that would have allowed a crossing by rafting over narrow seaways. The most likely time for such an excursion was during a brief cool/dry episode around 67 ka that coincided with an 80 m fall in global sea level: the largest since the previous glacial maximum (see [Evidence for early journeys from Africa to Asia](#)).

In 2011 finds reported from the United Arab Emirates of 'East African-looking' Middle Palaeolithic tools in sediment layers dated at 125, 95 and 40 ka led some to speculate that there must have been an eastward move from the Levant by anatomically modern humans (see [Human migration – latest news](#)). That view stemmed from the fact that the earliest date was during the last interglacial when sea level would have been as high as it is today, and around 95 ka it would have been little different. That report coincided with others about freshwater springs having emanated from uplifted reefs around the edges of the Arabian Peninsula during the last interglacial, and the existence of substantial lakes deep within the subcontinent around that time (see [Water sources and early migration from Africa](#)). Substantial funding followed such exciting news and results of new research are just beginning to emerge (Lawler, A. 2014. In search of Green Arabia. *Science*, v. **345**, p. 994-999).




Al Ain, a rare spring-fed oasis in the eastern Rub al Khali near the UAE-Oman border (credit: Wikipedia)

A team led by Michael Petraglia of the University of Oxford has used field surveys and remote sensing to reveal a great many, now-vanished lakes across the Arabian Peninsula, including many in the fearsome Rub al Khali or Empty Quarter. They are linked by an extensive, partly sand-hidden network of palaeochannels, which include several of the major wadis; a system that once drained towards the Persian Gulf. As well as abundant freshwater molluscs and other invertebrates, former lakeshore sediments are littered with huge numbers of stone tools, also with East African affinities (Scerri, E.M.L. *et al.* 2014. Unexpected technological heterogeneity in northern Arabia indicates complex Late Pleistocene demography at the gateway to Asia. *Journal of Human Evolution*, In Press <http://dx.doi.org/10.1016/j.jhevol.2014.07.002>). Using optically stimulated luminescence dating, which shows how long stone objects have been buried, the British team has found tools dating back as long as 211 ka, with a cluster of dates between 90 to 74 ka. Modern humans, Neanderthals and even Denisovans may have made these tools; only associated fossil remains will tell. Yet it is already clear that for lengthy periods – perhaps of a few hundred or thousand years – the hyper-arid interior of Arabia was decidedly habitable. It may have been a thriving outpost of emigrants from Africa, whose abandonment as climate shifted to extreme dryness as the last interglacial gave way to Ice Age conditions, could well have been the source of the great migration that colonised the rest of the habitable world. Petraglia's team has already courted controversy with their claim for anatomically modern humans' tools in South Indian volcanic ash beds that date to the Toba eruption around 74 ka: considerably earlier than the more widely accepted post-65 ka dates of human eastward migration.

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New Feature: Picture of the month

Posted on [August 31, 2014](#) by [Steve Drury](#) | [1 comment](#)

Having belatedly discovered [The Earth Science Picture of the Day](#) website (it has been going since September 2000; as long as *Earth Pages*!) I thought readers of *EPN* might like the aesthetic boost that it provides. So, on the last day of the month I intend to insert a link to what I think is the best of those contributed to EPOD over the previous 4 weeks or so.



The [Great Unconformity](#) of the Grand Canyon (credit: [Stan Celestian](#))

EPOD has a vast archive of contributions and each one has a brief description and links to other visual resources.

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Improved dating sheds light on Neanderthals' demise

Posted on [August 26, 2014](#) by [Steve Drury](#) | [Leave a comment](#)

As *Earth Pages* reported in [December 2011](#) a refined method of radiocarbon dating that removes contamination by younger carbon has pushed back the oldest accessible ^{14}C dates. Indeed, materials previously dated using less sophisticated methods are found to be significantly older. This has led archaeologists to [rethink several hypotheses](#), none more so than those concerned with the relationship in Europe between anatomically modern humans (AMH) and [Neanderthals](#), especially the extinction of the latter.

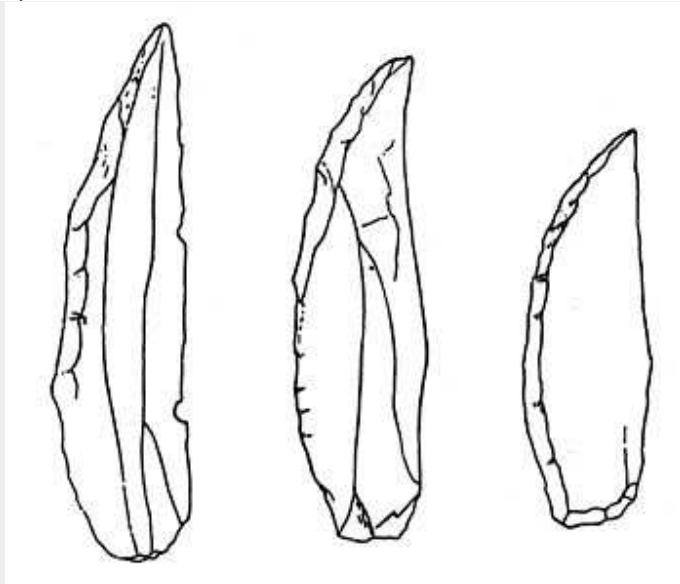
The team of geochronologists at Oxford University who pioneered accelerator mass spectrometry (AMS) of carbon isotopes, together with the many European archaeologists whose research has benefitted from it, have now published results from 40 sites across Europe that have yielded either Neanderthal remains or the tools they are thought to have fashioned (Higham, T. and 47 others. The timing and spatiotemporal patterning of Neanderthal disappearance. *Nature*, v. **512**, p. 306-309) . One such site is [Gorham's Cave](#) in the Rock of Gibraltar where earlier dating suggested that Neanderthals clung on in southern Iberia until about 25 ka. Another hypothesis concerns the so called [Châtelperronian](#) tool industry which previous dating at the upper age limit of earlier radiocarbon methodology could not resolve whether or not it preceded AMH colonisation of Europe; i.e. it could either have been a Neanderthal invention or copied from the new entrants. Most important is establishing when AMH first did set foot in previously Neanderthal's exclusive territory and for how long the two kinds of human cohabited Europe before the elder group met its end.



Reconstruction of Neanderthal life from the Neandertahl Museum(credit: Wikipedia)

The new data do not quash the idea of Neanderthals eking out survival almost until the last glacial maximum in the southernmost Iberian Peninsula, since material from Gorham's Cave could not be dated. However, occupation levels at another site in southern Spain in which Neanderthal fossils occur and that had been dated at 33 ka turned out to be much older (46 ka). So it is now less likely that Neanderthals survived here any longer than they did elsewhere.

Neanderthal remains are generally associated with a tool kit known as the Mousterian that is not as sophisticated as that carried by AMH at the same time. Of the Mousterian sites that yielded AMS ages, the oldest (the Hyaena Cave in Devon, Britain) dates to almost 50 ka. The youngest has a 95% probability of being about 41 ka old. Of course, Neanderthals may have survived until later, but there is no age data to support that conjecture. The earliest known AMH remains in Europe are those associated with the so-called Uluzzian tool industry of the Italian peninsula. In southern Italy Mousterian tools are replaced by Uluzzian between about 44.8 and 44.0 ka, while Mousterian culture was sustained in northern Italy until between 41.7 to 40.5 ka.



Châtelperronian stone tools (credit: Wikipedia)




Mousterian blade tool from France (credit: Wikipedia)


Châtelperronian tools associated with Neanderthal remains occur in south-western France and the Pyrenees. The new AMS dating shows that the culture arose at about the same time (~45 ka) as the Uluzzian tool industry began in Italy and ended in those areas where it was used at about the same time (~41 ka) as did the more widespread Mousterian culture. So the question of whether Neanderthals copied stone shaping techniques from the earliest Uluzzian-making AMH more than 500 km to the east, or invented the methods themselves remains an open question. But does it matter as regards the cognitive abilities of Neanderthals? Copying methodology is part and parcel of the success and survival of succeeding AMH, but o too is the capacity to invent useful novelties from scratch. So, yes it does matter, for Neanderthals had sustained the Mousterian culture for tens to hundreds of thousand years with little change.

The upshot of these better data on timing is that AMH and Neanderthals co-existed in Europe for between 2.6 to 5.4 ka; as long as the time back from now to the Neolithic and early Bronze Age. Even allowing for low population density to make contacts only occasional, this is surely too long for systematic slaughter of Neanderthals by AMH. Yet it gives plenty of time for two-way transmission of cultural and symbolic activities, and even for genetic exchanges: assimilation as well as out-competition.

Incidentally, *Scientific American's* September 2014 issue is partly devoted to broader issues of human evolution (Wong, K. (editor) *The Human Saga*. *Scientific American*, v. **311**(No 3), p. 20-75) with a focus on new developments. These cover: a revised time line; the emerging complexity of hominin evolution by veteran palaeoanthropologist Bernard Wood.; the influence of climate change; by Peter de Menocal; cultural evolution in the broad hominin context by Ian Tattersall; a discussion of hominin mating arrangements by Blake Edgar; two contributions on cooperation versus competition among hominins by Frans de Wall and GGry Stix; two articles on recent biological and future cultural evolution by John Hawks and Sherry Turkle (interview).

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Neanderthals Coexisted with Humans for More Than 5,000 Years

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Did Out of Africa begin earlier?

Posted on [August 15, 2014](#) by [Steve Drury](#) | [Leave a comment](#)

It is widely thought that anatomically modern humans (AMH) began to diffuse out of Africa during the climatic cooling that followed the last interglacial episode. Periods of build-up of ice sheets, or stadials, also saw falls in sea level, which would have left shallow seas dry and easily crossed. The weight of evidence seems to point towards the narrowing of the Red Sea at the Straits of Bab el Mandab between modern Eritrea and the Yemen. Because the Red Sea spreading axis goes onshore through the Afar region of Ethiopia further north, the Straits today are shallow. Between about 70 and 60 ka, during a major stadial, much of the Bab el Mandab would have been dry. Dating of the earliest AMH remains in Asia and Australasia seems to suggest that the move out of Africa probably began around that time. But, of course, that presupposes the AMH fossils being the oldest in existence, although some would claim that genetic evidence also supports a 70-60 ka migration. Yet, AMH human remains dated at around 100 ka have been found in the Middle East on a route that would also lead out of Africa, but for the major problem of crossing deserts of modern Syria and Iraq. The supposed desert barrier has led many to suggest that the earlier venture into the Levant met a dead end. Should AMH fossils older than 70 ka turn up in Eurasia or Australasia then a single migration becomes open to doubt.

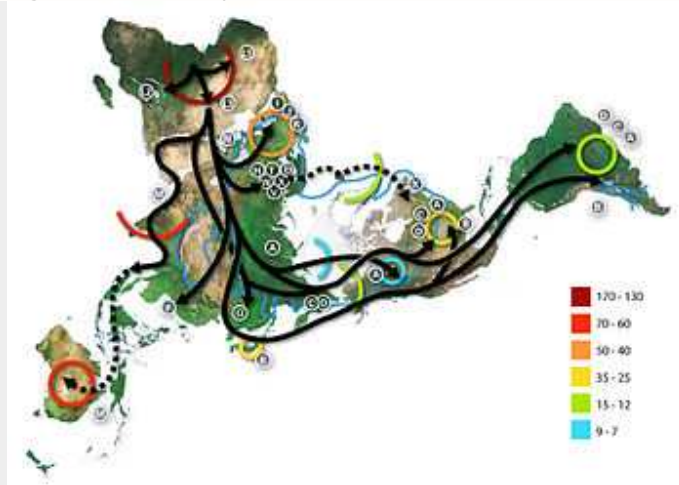


Chart of large human migrations based on variations in mitochondrial DNA in living humans (Numbers are millennia before present.)
(credit: Wikipedia)

It appears that challenge to what has become palaeoanthropological orthodoxy has emerged (Bae, C.J. *et al.* 2014. Modern human teeth from Late Pleistocene Luna Cave (Guangxi, China). *Quaternary International*, [In Press](#)). Scientists from the US, China and Australia found two molar teeth within calcite flowstone in Lunadong ('dong' means 'cave'). That speleothem is amenable to uranium-series dating, and has yielded ages between 70 and 127 ka. That antiquity does open up the possibility of earlier migration, perhaps during the interglacial that ended at about 115 ka when sea levels would have stood about as high as it does nowadays (in fact it was only after about 80 ka that it stood low enough to make a move across the Bab el Mandab plausible). If that were the case, the migration route would have more likely been through the Middle East, perhaps along the Jordan valley and thence to the east. Had there been greater rainfall over what is now desert then there would have been no insurmountable barrier to colonisation of Asia.

These teeth are not the only evidence for earlier entry of AMH into east Asia; a date of 66 ka for a modern human toe bone was recently

reported from the Philippines. Yet many experts remain unconvinced by teeth alone, especially from east Asia where earlier humans had evolved since first colonisation as early as 1.8 Ma ago. There are other pre-70 ka east Asian bones with more convincing AMH provenance, however.

There is another approach to the issue of earlier [Out of Africa migration](#); one resting on theoretical modelling of the observed genetic and morphological variation among living Eurasians, especially the decreasing diversity proceeding eastwards (Reyes-Centeno, H. *et al.* 2014. Genomic and cranial phenotype data support multiple modern human dispersals from Africa and a southern route into Asia. *Proceedings of the National Academy of Sciences*, v. **111**, p. 7248-7253. doi: 10.1073/pnas.1323666111). The authors, from Germany, Italy and France, challenge the single-exit hypothesis based on genetic data, suggesting that those data are also commensurate with several Out of Africa dispersals beginning as early as 130 ka. They favour the Bab el Mandab exit point and migration around Eurasia at that time when sea-level was extremely low during a glacial maximum. They hint at the ancestors of living native Australians and Melanesians being among those first to leave Africa, other Asian and European populations having dispersed from a later wave.

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Serious groundwater depletion in western US

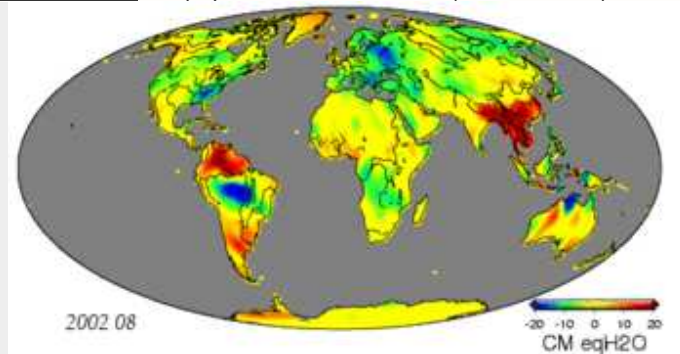
Posted on [August 15, 2014](#) by [Steve Drury](#) | [Leave a comment](#)

The 2300 km long Colorado River whose catchment covers most of Arizona and parts of the states of Colorado, California, Nevada, Utah, New Mexico and Wyoming is one of the world's most harvested surface water resources. So much so that barely a trickle now ends up in Baja California where the huge river once flowed into the sea. The lower reaches of the river system cross arid lands and it is the water source for several major cities and areas of intensive agriculture, serving as many as 40 million people and 16 thousand km² of irrigated fields. It has been nicknamed the US Nile because of its economic importance, but Egypt's Nile has far less pressure put on it, although its exit flow to the Mediterranean is also hugely reduced from its former peak volume. The water crisis affecting the Colorado River and the areas that it serves has peaked during the 14-year drought over its lower reaches. To ease conditions in the former wet lands of Mexico near the river's outlet 2014 saw deliberate major releases from giant reservoirs higher in the Colorado's course.



The Colorado River Basin (credit: Wikipedia)

Surface abstraction is not the only drain on water resources of the Colorado River basin: groundwater pumping from the sediments beneath has grown enormously for both irrigation and urban use. That it is possible to play golf at many courses in the desert and to see monstrous musical fountains in Las Vegas is down largely to groundwater exploitation. There have been concerns about depletion of underground reserves once abstraction outpaced natural recharge by infiltration of rainfall and snow melt, but highlighting the magnitude of the problem required a rather dramatic discovery: so much water has been lost from aquifers that the missing mass has reduced the Earth's gravitational field over the south-west US (Castle, S.L. *et al.* 2014. Groundwater depletion during drought threatens future water security of the [Colorado River Basin](#). *Geophysical Research Letters*, doi: 10.1002/2014GL061055).



Global Gravity Anomaly Animation over land from GRACE (credit: Wikipedia)

The evidence comes from the [Gravity Recovery and Climate Experiment](#)(GRACE), jointly funded by NASA and Germany's DLR and launched in March 2002. GRACE uses two satellites that follow the same orbit with a spacing of 220 km between them. Range finders on each measure their separation distance, and so their ups and downs as gravity varies, with far greater accuracy than any other method. Measuring the Earth's entire gravitational field at their orbital height takes about a month. [Groundwater depletion beneath the Gangetic Plains](#) of northern India, to the tune of 109 km³, was detected in 2009 and the same approach has been applied to the Colorado Basin for nine years between 2004 and 2013. It shows that during this part of one of the longest droughts in the history of the south-west US

50 km³ have been lost from beneath, as a rate of about 5.5 km³ per year. Though the total is half the loss from beneath northern India, it should be remembered that more than ten times as many people depend on the Ganges Basin. Moreover, there is no monsoon recharge in the south-western states.